
A framework towards IT appropriation in voluntary organizations

Saqib Saeed^{*}, Markus Rohde and Volker Wulf

Department of Information Systems and New Media,
University of Siegen
Hölderlinstr. 3, 57076 Germany
Email: Saqib.Saeed@uni-siegen.de
Email: Markus.Rohde@uni-siegen.de
Email: Volker.Wulf@uni-siegen.de
URL: <http://www.wineme.uni-siegen.de>
^{*}Corresponding author

Abstract: There have been different research efforts to analyze the potential, impact and benefits of introducing information technology in voluntary organizations. But recent literature has highlighted that many voluntary organizations are still in an early stage of IT adoption, in their organizational settings. The lack of funding, unstable organizational structures and diversity in operations are key facts which make IT support in voluntary organizations an interesting emergent field of research. In this paper we analyze types and organizational structures of voluntary organizations to find out the factors which differentiate the IT support in these organizations as compared to other organizations. The paper advocates need for more ethnographic work to closely analyze the work practices of voluntary organizations. The paper provides a summary of related work carried out in participatory development with voluntary organizations and discusses important issues which are worth investigating for the improvement of IT support in voluntary organizations.

Keywords: IT Support, Organizational Practices, IT Appropriation, Voluntary Organizations, System Design, NGOs, Participatory Development.

Reference to this paper should be made as follows: Saeed, S., Rohde, M. and Wulf, V., 'A framework towards IT appropriation in voluntary organizations', *Int. J. Knowledge and Learning*, Vol. 4, No. 5. pp. 438-451

Biographical notes:

Saqib Saeed is a Ph.D. student at University of Siegen, Germany. He holds a Masters degree in software technology from Stuttgart University of Applied Sciences, Germany. He was working as lecturer at the department of Computer Sciences and Engineering at Bahria University Islamabad, Pakistan before coming to Siegen.

Markus Rohde, Dr., studied psychology and sociology at the University of Bonn and is one of the founders of the International Institute for Socio-Informatics (IISI). At the moment he is working as project manager for IISI and as research leader of Community Informatics at the Institute for Information Systems, University of Siegen Germany.

Volker Wulf is a Professor in information systems and the director of the Media Research Institute at the University of Siegen, Germany. He also heads a

research group of user centred software engineering at Fraunhofer FIT Sankt Augustin and a founding member of the International Institute for Socio-Informatics, Bonn Germany.

An earlier version of this paper was presented at the 1st Word Summit on Knowledge Society, Athens, Greece; 24-28 Spetember 2008.

1 Introduction

The civil society organizations form an important constituent of any society along with business and governmental organizations. It is widely accepted that the concept of a country's development cannot be achieved by only relying on the efforts of government organizations especially in the resource starved countries. Keeping this in view governments also encourage civil society organizations to come and support them. Civil society organizations are quite diverse in their compositions and operations. They can be community based organizations, non governmental organizations (NGOs), activist groups, think tanks, trade unions, professional associations, cultural groups, religious organizations, informal citizen organizations, foundations, commissions, cooperatives, clubs and charities. NGOs are most widely known fraction of civil society organization, which has experienced tremendous growth in the last two decades. As United Nations considers all private bodies to be an NGO which are independent from governmental control and do not seek to challenge government as political party all forms of voulantary organizations fall into this category. In this paper we will use the term "voulantary organizations" in generic way to denote all types of voulantary organization.

Voulantary organizations help society by contributing vital information and ideas, advocate on behalf of society, perform operational roles in emergencies and development efforts and provide accountability in global governance process (Mostashari, 2005). In order to carry out these activities their association with people at the micro level is established, and this reach to grass root level helps them to influence governments in their policy making. Increasingly, citizens are also becoming reliant on civil society organizations to advocate for local, national, and international policy change and to learn about critical educational, political, economic, health, and environmental issues on behalf of them (Rusten, 2003). Sooner voulantary organizations become aware that problems such as AIDS, global warming, human rights, sustainable development, and disaster management cannot be dealt with locally but require cooperation beyond the borders of the national state. Keeping in view this scenario, donor agencies started funding globally and voulantary organizations started to establish operations worldwide. Some organizations established their own offices in remote continents while others preferred to collaborate with local partners. So in this context new collaborations between voulantary organizations of north and south emerged. In order to carry out the tasks successfully the communication among stake holders like public, collaboration partners, field staff, office staff, governmental agencies and donor agencies requires effective communication methodologies. Along with this, effective project and people management skills aided with knowledge management methodologies to implement projects are required to be successful at this huge level. In this context effective knowledge and learning methodologies could improve the working environments of voulantary organizations and

prepare them for an active role in the knowledge society (Lytras and Sicilia, 2005). The advancements in information and communication technology can benefit these organizations in adopting optimized knowledge and learning methodologies. These benefits are often gained by developing applications having combined functionalities of information sharing, storage and retrieval and combination (Maitland, Pogrebnyakov, and van Gorp, 2006). Despite the tremendous growth of use of Information Technology in business organizations, use of IT in voluntary sector is slimmer.

The objective of this paper is to highlight the obstacles in gaining technological appropriateness in voluntary organizations along with a literature review of participatory design efforts in voluntary organization. The remaining of the paper is structured as follows. Section 2 describes different research efforts to analyze the impact of ICT involvement in different voluntary organizations whereas section 3 discusses the structures of voluntary organizations to portray the difference between voluntary and conventional business organizations. The section 4 discusses in detail the ICT empowerment efforts by different researchers in volunteer organizations followed by the conclusion.

2 Background

The role of technology and benefits of employing technology for voluntary organizations has been discussed by different researchers. c.f. (Gage, 2002; Eggleston, Jensen, and Zeckhauser, 2002; Hammond et al., 2003). Similarly (Mcnamara, 2003) has analyzed the role of information and communication technology in meeting Millennium Development Goal (MDG) set by United Nations. There have been different research initiatives to find out the benefits and advantages of using innovative technologies in the organizational contexts of voluntary organizations. (O'Donnell, 2001) has analyzed the role of alternative media by evaluating a mailing list that connected women organizations in Northern Ireland. (Saidel and Cour, 2003) have investigated three nonprofit organizations in the state of New York to find out how information technology changing the distribution of work and working relationships in voluntary organizations. (Cammaerts and Van Audenhove, 2003) has investigated how transnational social movement organizations use Internet in their organizing process and enabling online civic engagement. They have also analyzed the relationship of ICTs to their policy and politics. (Donk et al., 2004) has discussed the role of ICTs in the communication process of social movements. (Pini et al., 2004) has investigated that how discussion list is being used by an Australian farm women group (AWiA). (O'Donnell and Ramaioli, 2004) have investigated an online information network for nonprofit sector in Ireland. This research describes a practical experience from Ireland, which suggests the possibility of sustainability of an online public sphere is by the continuous volunteer efforts. (Cheta, 2004) has investigated the effective usage of internet by Portuguese Accessibility Special Interest Group (GUIA) which is a social movement organization. (Edwards, 2004) has investigated the role of internet in the Dutch women's movement. (Cordoso and Neto, 2004) have investigated the role of ICTs in the pro-East Timor movement in Portugal. (Van Aelst and Walgrave, 2004) has investigated the role of internet in the anti globalization movement. (Kavada, 2005) has investigated the usage of internet by three non governmental organizations in UK. There has been research about the roles, challenges and opportunities for community intermediary organizations in Canada to

meet the needs of citizens by deploying Information and Communication technologies (Rideout et al., 2006; O'Donnell et al 2006; O'Donnell et al 2007). (O' Donnell, 2007b) has investigated that how two community based organizations are using video communications to support economic and social development in remote and rural areas in Canada. (Kavada, 2007; Kavada, 2007a) investigated how email lists are helping in the organizing process of the European Social forum, an event that gathers social activists from all over the Europe. (Saeed, Rohde and Wulf, 2008b) have described that how ICTs can serve as an alternative sphere for social movements in Pakistan.

Despite the above mentioned success stories the technological appropriation is far from reality in voluntary organizations. The research finding suggesting that despite the potential of ICTs, it is not effectively used in these organizations. The research efforts have highlighted that most voluntary organizations lack appropriation of ICTs in their organizational settings. (Trench and O'Donnell, 1997; O'Donnell and Trench, 1999) has investigated the Irish voluntary organizations and described that despite the potentials of new communication methods and information technology these will be restricted to organizations having more resources. A study by TBC Research UK in 2001 found that 62% of voluntary organizations have indicated a poor relationship between their mission and information technology strategy (Surman and Reilly, 2003). Similarly a study by the Association of Progressive Communication revealed that most of transnational civil society organizations felt that they were strong in the areas of internet access and e-mail use and rather weak in areas such as holding online meetings and running internet advocacy campaigns. Kellogg Foundation's ePhilanthropy report describes that technology and internet services are far from being integrated into organizational process of voluntary organizations (Surman and Reilly, 2003). (Cogburn, 2004) empirically evaluated computer mediated communication among civil society representatives at United Nations World Summit on Information Society (WSIS) and its preparation phase meetings. He described the tools used for computer mediated communication included email lists, web portal, internet relay chat (IRC), and a web log. But the majority of communication took place using e-mail lists while other complex tools such as document repositories, wikis, blogs, and Web conferencing, have not been used effectively. (Goatman and Lewis, 2007) surveyed 1000 UK charities and found that non profit institutions are positive about use of websites and are interested in improving use of internet technologies in future. They also found out that currently websites are only used to present information about their activities rather finding new collaborators, fund raising and community interaction. People working in the community organizations have awareness to use technology in their activities but the complexity of technologies and lack of technological knowledge are big obstacles (Farooq et al., 2006). These findings advocate the potential for technological appropriation in the organizational settings.

3 Structure of Voluntary Organizations

The appropriation of technology can be achieved when the technologies are designed keeping in mind the structure and practices of application area. For this reason it is important to understand the types and structures of voluntary organizations which will help in finding the differences in their needs. These organizations can be categorized into two groups with respect to their work focus: operational and advocacy (Mostashari, 2005). Normally operational voluntary organizations focus on small scale change by

carrying on projects at grass root levels whereas advocacy organizations aim at large scale change by influencing the political system. So the support of IT facilities for communication process in voluntary organizations could be among office settings, office-government, field-government, office-public, field-public, office-donor and office-other collaborating organizations. Operational voluntary organizations have strong presence of staff at headquarters for planning and on the field staff for implementation whereas advocacy organizations focus on awareness, opinion and policy making resulting in absence of field activities. The communication needs keep on extending as the size and scope of these organizations expand. The geographical distances among field, office and headquarter locations add further complexity in designing IT systems for voluntary organizations. This involvement at different state and local levels introduces problems like different governmental partners, differences in languages being spoken, difference in working habits and difference of culture among the staff. It has been widely accepted that work practices and inter cultural issues have a significant impact on the acceptance of new technological systems. If these issues are not kept in mind the introduction of technology could not achieve expected results. The working methodology of voluntary organizations suggest that some may have centralized control at headquarter level while others have independent offices in the distributed locations (Mostashari, 2005). The management of IT infrastructure at centrally controlled organizations is simpler as compared to organizations who have distributed autonomous offices. But on the other hand introducing same IT infrastructure at different geographical locations ignores the ground reality of difference in culture, background, education, skills etc. As the voluntary organizations work in diverse application areas the IT requirements in field and office settings are different from each other depending upon their operational area e.g. a child care NGO and an emergency relief organization have rather different needs.

Another important dimension is organizational structure of NGOs and level of professionalism of the staff. Small NGOs normally don't have a defined organizational structure. The organizational structure exists but it is not permanent which means that an individual who is supervising a particular task may not be supervising other tasks. This results in lack of organizational knowledge and inconsistency in decision making, posing difficulty in establishing IT infrastructures in the NGO sector. The sustainability of present IT infrastructure is also affected by the inconsistency in decision making resulted due to lack of permanent hierarchy. Secondly, NGOs normally do not have formal requirements of a specific profile to become a member. So, volunteer will not possess any specific skill set or profile. This typically results in low emphasis on developing IT infrastructures and using IT capabilities to perform their tasks. Whereas big transnational NGOs have large number of dedicated staff and specialized IT staff to help them in establishing IT infrastructure and using computing capabilities. So the usability issues should also be considered while designing the IT systems. The background of the volunteers, their intention to volunteer for the organization and organizational commitment play vital role in sustainability of IT infrastructure. The NGOs normally lack funding as donors are normally interested in supporting NGOs in their core activities but it is hard to find a donor who is interested in financing these NGOs to establish and maintain IT infrastructures. So the open source development can reduce the financial issues to an extent.

4 Related Work

The work to appropriate technology in the non profit sector has its precedents. There have been examples of appropriating technology in non profit organizations by different researchers. The participatory design methodologies backed by ethnographic studies help to better understand the organizational needs. (Benston, 1990) has described that how participatory design method can be used to help non profit sector organizations. CAVEAT is an example of involving a Canadian non profit organization in participatory design methodology to establish a prototype of an organization information system using the shelf database components. The prototype soon became operational but required further extensions (McPhail et al., 1998). There has been an effort by (Trigg, 2000) to apply participatory design principles by involving a local non profit organization in its database re-design and development activity. Another effort to empower NGOs with computing capabilities is carried out in the “Civic Nexus” project (Farooq et al., 2005; Farooq et al., 2006). The objective of the project was to empower regional volunteer organizations in the Centre County Pennsylvania by involving volunteers not just in simple tool development but in the whole technological process (Merkel et al., 2004; Merkel et al., 2007). Participatory design and end user development concepts are applied to the regional non governmental organizations. An example of the work is to empower Spring Creek Watershed Community (SCWC) to achieve goal of sustaining watershed planning by introduction of technology. They have also applied the concept of wikis to test the effectiveness of end user development notion on the Non Governmental Organizations (Farooq, 2005). Based on experiences with community groups in Centre County, Pennsylvania, and Montgomery County, Virginia they have also developed design patterns to improve learning of basic use of IT among NGO staff (Carroll and Farooq, 2007). The main focus of this work is on technological sustainability within community organizations (Merkel et al., 2005). (Rohde, 2003; Rohde, 2004) has investigated how Iranian NGOs can benefit from social capital fostered by introduction of a Communities of Practice concept. In this case methods of participatory design are applied to electronically network an Iranian NGO community to gain advantages of social capital. Shamail et al., 2003; Shamail, Awais and Hussain 2005) have advocated the idea of development of web portal for better capacity building in social organizations in Pakistan. The ‘Sahana’ is another instance of computerization effort in NGOs. It is an open source disaster management system which is developed by Lanka Software Foundation, an NGO in Sri Lanka. The software was developed by a group of volunteers from Sri Lankan IT industry. The software was used in the 2004 Tsunami in Sri Lanka, 2005 Pakistan earthquake, 2006 Philippines mudslides and 2006 Yogyakarta earthquake in Indonesia. The system is in place in Sri Lanka’s largest NGO “Sarvodaya” to combat with future disasters. Another International NGO Terre des Hommes is also using a customized version of this software for child protection (Currion, Silva and de Walle, 2007). Klein et al. have presented a computer supported cooperative learning environment for NGOs, which are engaged in Africa promoting children rights by using art work. The system enables NGOs to share their ideas and best practices (Klein et al (2005)). (Figueiredo, Camara and Sabin, 2006) have described their experiences of establishing telecenters in poor regions of Brazil by the Gems of the Earth (an NGO). The objective of this NGO is to empower small rural communities by deploying modern technologies. (Gandhi et al., 2007) has worked in collaboration with GREEN foundation (an NGO) to disseminate agricultural information to small farmers in India by using

digital video. On the basis of field studies they have developed a system comprising of a TV and DVD player for each village, and a digital camera and personal computer shared among all villages. The system trial in 16 villages showed an increase in the adoption of agricultural practices by using this system. (Sterling, O'Brien and Bennett, 2007) are planning to setup a community radio system for enhancing women involvement in the developing communities with the collaboration of VOICES (an NGO in Bangalore, India). (Sherwani et al., 2007) have collaborated with The Health and Nutrition Development Society (HANDS) to establish a speech based health information access system for less educated community health workers. The prototype of the system was evaluated in a health center of rural Sindh, Pakistan. (Medhi et al, 2006; Medhi and Toyama, 2007) worked with Stree Jagruti Samiti (an NGO working with women and children in slum communities in Bangalore, India) to setup a job search application. The idea of this work was to empower first time non literate users of PCs by full context videos. (Kumar et al., 2007) with the collaboration of a community-based NGO called the Adarsha Mahila Samaikhya (AMS), in South Central India has developed a geo information system based vulnerability assessment framework for use of rural families. The objective was to setup early information about drought by predicting rainfalls. (Bhattacharya, Basu and Samanta, 2007) have deployed the virtual scanning keyboard at Indian Institute of Cerebral Palsy (IICP), Kolkata, India which is an NGO working with people having speech and motion impairments. The system works in Bengali language, and allows users to compose text and has Bengali text to speech synthesis to allow speech impaired users to speakout the composed message. (Basha and Rus, 2007) has worked with an NGO called Centro Técnico San Alonso Rodríguez (CTSAR), based in Tocoa, Honduras. They have investigated the problem of flooding on the Aguán River in north-eastern Honduras and carried out series of experiments, and on the basis of their solution has described lessons learned. (Veeraraghavan, Yasodhar and Toyama, 2007) has worked with a sugar cane cooperative in Warana, India and replaced PC based system with a mobile phone system whose objective was to provide farmers meaningful information like real time prices, agricultural advice etc. MS Swaminathan Research Foundation (MSSRF) is an NGO working in Tamil Nadu, India to foster economic growth in rural agricultural areas. The NGO provides information about agricultural goods and techniques, weather, local news, employment, and government policies and services to local farmers. (Plauche et al., 2006) have worked with MSSRF to develop a spoken dialog system to enable illiterate users access this information.

There has also been related work to investigate IT usage in NGOs working in transnational context. (McIver, 2004; McIver, 2004a) worked in the context of transnational NGOs after his experiences on drafting legislation for civil society's agenda on World Summit on International Society (WSIS). He has worked on transnational, multi lingual collaborative legislative work among NGOs. He analyzed that a number of systems have been developed that support various aspects of versioning and collaborative work but are not specifically designed to support legislative drafting . (Saeed, Reichling and Wulf, 2008b) have described how knowledge management and expertise recommending systems can help NGOs and Donor organizations of North and South in establishing successful collaborations. Pilemalm has involved Swedish trade unions in participatory design approaches for exploring IT needs, establishing solutions and their impact on Swedish trade unions. In this research users actively participated in the information system design process. In this research participatory design method is

extended to deploy in nonprofit organizations (Pilemalm, Hallberg and Timpka, 1998; Pilemalm, Hallberg and Timpka, 2001; Pilemalm and Timpka, 2002; Pilemalm, 2002).

The urge to empower voluntary organizations with innovative technology is also strongly felt even within NGOs community itself. In order to improve the IT use and appropriation different projects are carried out by voluntary organizations themselves as well. In 2003 Interagency Working Group (IWG) on Emergency Capacity was formed by a consortium of seven NGOs to analyze collaborative capacity-building effort in the areas of staff capacity, accountability and impact measurement, risk reduction, Information and Communication Technology requirements. The participating NGOs were Oxfam-GB, Save the Children-US, World Vision International, Catholic Relief Services, the International Rescue Committee, CARE International, and Mercy Corps. Currian based on his headquarter visit of participating NGOs and field visits in Pakistan and Sudan presented a comprehensive report on the use of Information Technology by the IWG agencies in their global response to emergencies. In June 2006 he also published his findings and recommendations on the use of Information and Technology by the IWG agencies in their response to emergencies. This forms a first detailed study of use of ICTs in the NGOs at the time of emergency (Currian, 2006). NetHope is another nonprofit corporation which helps member NGOs by sharing information technology knowledge. The goal of the program is to help NGOs improve emergency response and enhance organizational effectiveness by strengthening crucial information technology skills (Nethope, 2008). A group LINGOS provide its services to improve performance and effectiveness of non governmental organizations. It has a Learning Management System (LMS) that enables NGOs to host, develop, track and implement learning content for their staff. They have implemented communities of practice idea to provide a venue for learning professionals from international NGOs to share information on course availability, best practices in learning, sources for learning products, links to sites on learning and development issues and other topics of common interest (Lingos, 2008).

5 Conclusions

The paper suggests that IT support for voluntary organizations is an important area and its importance has been accepted by civil society organizations and researchers alike but there is need for more intense research efforts by the academicians and researchers. There is need to focus ICT research, design, and implementation on addressing the most pressing human development issues (O' Donnell, 2003; McIver, 2006). This discussion highlights sporadic efforts to embed information technology in civil society organizations. As these organizations work in vast geographical area the difference in culture, backgrounds, education, work practices, available infrastructure and needs, play a vital role in the acceptance of technology. A generic solution to all scenarios is not effective and these factors make technological appropriation much more complex.

One central research question which still needs an answer is how information technology services and applications can be effectively embedded in organizational settings of transnational voluntary organizations to achieve technological appropriation. The structure and working methodology of voluntary organizations show some similarities with business/governmental organizations but considerable differences too. So it needs to be investigated how the organizational structure and application area affect the IT requirements of transnational voluntary organizations. As the volunteers are the

core of these organizations and since they are highly dynamic organizations, it is also worth investigating how knowledge management technologies can overcome existing shortcomings and help in establishing organizational knowledge. The importance of effective knowledge management methodologies has been proven c.f. (Stehr, 2007; Joia, 2007; Brauch and Tzokas, 2008; Minocha and Stonehouse, 2008) so these advanced systems can help in effective management of knowledge in organizational settings of voluntary organizations. This could also prove to be a step forward towards transformation into knowledge society as these systems will help in open access, freedom of speech and reduction in digital divide. There is need for developing effective applications to enhance the internal and external communication among transnational voluntary organizations. Another question which needs to be investigated is how new media can be used for the voluntary organizations in the less developed countries for advocacy and mobilization purposes.

In this context there is need for more ethnographic studies and participatory development efforts to enable this sector with technologies helping effective communication among stakeholders. (Donors, NGOs, Public, Staff and Government representatives.) These studies will help in understanding the barriers and problems in technological adoption in this sector so that the new customized design solutions consider those deficiencies and this will help in achieving technological appropriation. The technological support by advanced systems like web 2.0 can help in improving their operations, reach and communication among stakeholders. There has not been enough research that how new features of social web like Blogs, Facebook, Youtube are helping the voluntary organizations in their working. In the absence of huge data of valid studies investigating the impact of web 2.0 applications in voluntary organizations it is a bit early to proclaim the advantages of these applications for this sector.

We are interested in investigating the role of IT in enabling networks of voluntary organizations, as this sector is socially important and scientifically interesting as well. Their requirements are very particular and need to be better understood when trying to empower cross-cultural networks of voluntary organizations. In this context we are investigating the role of information and communication technologies in the organizing process of European social forum. This event is not organized by a single NGO but a network of international networks of NGOs, labour organizations, social movements and activists. So this extensive collaboration between people from different geographical regions, cultures and backgrounds will allow us to better understand organizational practices, and an analysis of these practices will help in development of potential information systems for civil society networks. Secondly we are in the initial stages of starting a research on the usage of web 2.0 by different transnational NGOs in their work settings. We are confident that the findings from our studies will help in better understanding the IT requirements of this sector and more researchers will focus towards helping voluntary organizations by customizing technology for them. In this way these organizations could be better prepared to carry on their roles in knowledge society.

References

- A. Hammond, A., Jenkins, E., Kramer, W. and Paul, J. (2003) *Innovation and The Social Enterprise: Creating Development Value At The Village Level* World Resources Institute.

- Basha, E., and Rus, D. (2007) 'Design of Early Warning Flood Detection Systems for Developing Countries.' *Paper Presented at the International Conference on Information and Communication Technologies for Development. December 15-16, 2007. Bangalore, India.*
- Benston, M. (1990) 'Participatory designs by non-profit groups.' *Paper Presented at the Participatory Design Conference. March 31-April 1, 1990. Seattle, Washington.*
- Bhattacharya, S., Basu, A. and Samanta, D. (2007) 'Performance Models for Virtual Scanning Keyboards: Reducing User Involvement in the Design.' *Paper Presented at the International Conference on Information and Communication Technologies for Development. December 15-16, 2007. Bangalore, India.*
- Brauch, Y. and Tzokas, N. (2008) 'The translation of higher-level knowledge into different levels of managerial and creative competencies', *International Journal of Learning and Intellectual Capital 2008 - Vol. 5, No.2 pp. 223 – 240.*
- Cammaerts, B. and Van Audenhove, L. (2003) *ICT-Usage among Transnational Social Movements in the Networked Society: to organise, to mediate & to influence.* ASCoR, Amsterdam Free University, Amsterdam.
- Carroll, J.M. and Farooq, U. (2007) 'Patterns as a paradigm for theory in community-based learning', *International Journal of Computer-Supported Collaborative Learning*, Vol. 2, No. 1, pp. 41-59.
- Cardoso, G. and Neto, Pereira P. (2004) 'Mass media driven mobilization and online protest ICTs and the pro-East Timor movement in Portugal', In: W. van de Donk, B. D. Loader, P. G. Nixon, & D. Rucht (Ed.), *Cyber Protest, New Media, Citizens and Social Movements (pp 147-163)*, London: Routledge.
- Cheta, R. (2004) 'Dis@bled people, ICTs and a new age of activism A Portuguese accessibility special interest group study', In: W. van de Donk, B. D. Loader, P. G. Nixon, & D. Rucht (Ed.), *Cyber Protest, New Media, Citizens and Social Movements (pp 207-232)*, London: Routledge.
- Cogburn, D., L. (2004) 'Diversity Matters, Even at a Distance: Evaluating the Impact of Computer-Mediated Communication on Civil Society Participation in the World Summit on the Information Society', *Information Technologies and International Development*, Vol. 1, No. 3-4, pp.15-40.
- Currión, P., Silva, C. d., and Van de Walle, B. (2007) 'Open source software for disaster management', *Communications of the ACM*, Vol. 50, No. 3, pp.61-65.
- Currión, P. (2006) *NGO Information Technology and Requirements Assessment Report*, Emergency Capacity Building Project Obtained through the Internet: http://www.ecbproject.org/publications_4.htm [accessed 04/09/2008].
- Donk, van de, W. Loader, B., D., Nixon, P., G. And Rucht, D. (2004) 'Introduction: Social Movements and ICTs', In: W. van de Donk, B. D. Loader, P. G. Nixon, & D. Rucht (Ed.), *Cyber Protest, New Media, Citizens and Social Movements (pp 1-26)*, London: Routledge.
- Edwards, A. (2004) 'The Dutch women's movement online Internet and the organizational infrastructure of a social movement', In: W. van de Donk, B. D. Loader, P. G. Nixon, & D. Rucht (Ed.), *Cyber Protest, New Media, Citizens and Social Movements (pp 183-206)*, London: Routledge.
- Eggleston, K., Jensen, R. and Zeckhauser, R. (2002) 'Information and Communication Technologies, Markets, and Economic Development' In: G. Kirkman et al., (ed.), *The Global Information Technology Report 2001-2002: Readiness for the Networked World*, New York: Oxford University Press.
- Farooq, U. (2005) 'Conceptual and technical scaffolds for end user development: Using scenarios and wikis in community computing.' *Paper Presented at the IEEE Symposium on Visual Languages and Human-Centric Computing September 21-24, 2005. Dallas, USA.*
- Farooq, U., Merkel, C.B., Nash, H., Rosson, M.B., Carroll, J.M., and Xiao, L. (2005) 'Participatory Design as Apprenticeship: Sustainable Watershed Management as a Community Computing

- Application.' *Papere Presented at 38th Annual Hawaii International Conference on System Sciences January 3-6, 2005*. Big Island, HI, USA.
- Farooq, U., Merkel, C.B., Xiao, L., Nash, H., Rosson, M.B., and Carroll, J.M. (2006) 'Participatory design as a learning process: Enhancing community-based watershed management through technology', In: S.P. Depoe (Ed.), *The Environmental Communication Yearbook, Volume 3* (pp 243-267) Mahweh, NJ: Erlbaum.
- Figueiredo, M., Camara, M. and Sabin, R. (2006) 'Impact of the Insertion of Modern Information and Communication Technologies in Brazilian Rural Communities.' *Paper Presented at the International Conference on Information and Communication Technologies and Development. May 25-26, 2006*. Berkeley, USA.
- Gage, J. (2002) 'Some Thoughts on How ICTs Could Really Change the World' In: G. Kirkman et al., (ed.), *The Global Information Technology Report 2001-2002: Readiness for the Networked World*, New York: Oxford University Press.
- Gandhi, R., Veeraghavan, R., Toyama, K. and Ramprasad, V. (2007) 'Digital Green: Participatory Video for Agricultural Extension.' *Paper Presented at the International Conference on Information and Communication Technologies for Development. December 15-16, 2007*. Bangalore, India.
- Goatman, A. K., and Lewis, B. R. (2007) 'Charity e-volution? An evaluation of the attitudes of UK charities towards website adoption and use', *International Journal of Nonprofit and Voluntary Sector Marketing*, Vol. 12, No. 1, pp.33-46.
- Joia, A. L. (2007) 'Knowledge management strategies: creating and testing a measurement scale', *International Journal of Learning and Intellectual Capital*, Vol. 4, No. 3, pp.203-221.
- Kavada, A. (2005) 'Civil Society Organizations and the Internet: the Case of Amnesty International, Oxfam and the World Development Movement', In: W. de Jong, M. Shaw and N. Stammers (ed.), *Global Activism, Global Media* (pp 208-222), London: Pluto Press, Ann Arbor: University of Michigan Press.
- Kavada, A. (2007) *The European Social Forum and the Internet: A Case Study of Communication Networks and Collective Action*. Ph.D Thesis. University of Westminster, UK.
- Kavada, A. (2007a) 'Email lists as multiple sites of identity construction: the case of the London 2004 European Social Forum.' *Paper presented at the Symposium 'Changing Politics through Digital Networks', 5-6 October, 2007*, Florence, Italy.
- Klein, R.R., Letaief, R., Carter, S., Chabert, G., Lasonen, J. and Lubart, T. (2005) 'CSCL for NGO's cross cultural virtual teams in Africa: an Ethiopian children advocacy case study against exclusion and toward facilitation of expression, innovation and creativity.' *Paper Presented at the 5th IEEE International Conference on Advanced Learning Technologies. July 5-8, 2005*. Kaohsiung, Taiwan.
- Kumar, G., D., Nagarajan, R., Rao, A., V., R., K. and Balaji, V. (2007) 'Village Knowledge Centers and the Use of GIS derived Products in Enhancing Micro-level Drought Preparedness: a Case study from South Central India.' *Paper Presented at the International Conference on Information and Communication Technologies for Development. December 15-16, 2007*. Bangalore, India.
- LINGOs (2008) Obtained through the Internet: <http://www.lingos.org> [accessed 04/09/2008].
- Lytras, M.D. and Sicilia, M.A. (2005) 'The Knowledge Society: a manifesto for knowledge and learning', *Int. J. Knowledge and Learning*, Vol. 1, Nos. 1/2, pp.1-11.
- Maitland, C.F., Pogrebnyakov, N. and van Gorp, A. (2006) 'A fragile link: Disaster relief, ICTs and development.' *Paper Presented at the International Conference on Information and Communication Technologies and Development. May 25-26, 2006*. Berkeley, USA.
- McIver, W. (2004) 'Tools for collaboration between trans national NGOs: multilingual, Legislative Drafting.' *Paper Presented at the International Colloquium on Communication and Democracy: Technology and Citizen Engagement. August 4 - 6, 2004*. Fredericton, New Brunswick, Canada.

- McIver, W. (2004a) 'Software Support for Multi-Lingual Legislative Drafting.' Paper Presented at the Community Informatics Research Network Conference and Colloquium (CIRN 2004). September 29 - October 1, 2004. Tuscany, Italy.
- McIver, W. (2006) 'Community Informatics and Human Development.' *Paper Presented at the International Workshop on Community Informatics (COMINF'06)*. November 2-3, 2006. Montpellier, France.
- McNamara, K., S. (2003), *Information and Communication Technologies, Poverty and Development: Learning from Experience* World Bank.
- McPhail, B., Costantino, T., Bruckmann, D., Barclay, R. and Clement, A. (1998) 'CAVEAT Exemplar: Participatory Design in a Non-Profit Volunteer Organisation', *Computer Supported Cooperative Work*, Vol. 7, No. 3, pp.223-241.
- Medhi, I., Sagar A., and Toyama K. (2006) 'Text-Free User Interfaces for Illiterate and Semi-Literate Users.' *Paper Presented at the International Conference on Information and Communication Technologies and Development*. May 25-26, 2006. Berkeley, USA.
- Medhi, I. and Toyama, K. (2007) 'Full-Context Videos for First-Time, Non-Literate PC Users.' *Paper Presented at the International Conference on Information and Communication Technologies for Development*. December 15-16, 2007. Bangalore, India.
- Merkel, C.B., Xiao, L., Farooq, U., Ganoë, C.H., Lee, R., Carroll, J.M., and Rosson, M.B. (2004) 'Participatory Design in Community Computing Contexts: Tales from the Field.' *Paper Presented at the Participatory Design Conference* July 27-31, 2004. Toronto, Canada.
- Merkel, C., Clitherow, M., Farooq, U., Xiao, L., Carroll, J.M., and Rosson, M.B. (2005) 'Sustaining Computer Use and Learning in Community Computing Contexts: Making Technology Part of 'Who They Are and What They Do'', *The Journal of Community Informatics* (online), Vol. 1, No. 2, pp.158-174.
- Merkel, C., Farooq, U., Xiao, L., Ganoë, C., Rosson, M. B., and Carroll, J. M. (2007) 'Managing technology use and learning in nonprofit organizations: methodological challenges and opportunities.' *Paper Presented at the Symposium on Computer Human interaction For the Management of information Technology* March 30 - 31, 2007 Cambridge, Massachusetts.
- Minocha, S. and Stonehouse, G. (2008) 'Dimensions of KM: they know not its called knowledge... but they can manage it!', *International Journal of Teaching and Case Studies* Vol. 1, No. 3, pp. 253-265.
- Mostashari, A. (2005) *An Introduction to Non Governmental Organizations Management* Iranian Study Group MIT Obtained through the Internet: <http://web.mit.edu/isg/NGOManagement.pdf> [accessed 04/09/2008].
- NetHope (2008) Obtained through the Internet: <http://www.nethope.org> [accessed 04/09/2008].
- Nip, Joyce Y. M. (2004) 'The queer sisters and its electronic bulletin boards A study of the internet for social movement mobilization', In: W. van de Donk, B. D. Loader, P. G. Nixon, & D. Rucht (Ed.), *Cyber Protest, New Media, Citizens and Social Movements* (pp 233-258), London: Routledge.
- O'Donnell, S., & Trench, B. (1999). *Voluntary and community organizations in Ireland's "information society"*. Coleraine: University of Ulster (monograph inseries).
- O'Donnell, S. (2001) 'Analysing the Internet and the Public Sphere: The Case of Womenslink', *Javnost*, Vol. 8, No. 1, pp.39-58.
- O'Donnell, S. (2003). 'Civil Society Organisations and an Inclusive Information Society in Europe'. In: B. Cammaerts, L. Van Audenhove, L. Nulens & C. Pauwels (Ed.), *Beyond the Digital Divide: Reducing Exclusion, Fostering Inclusion* (pp. 127-142). Brussels: VUB Brussels University Press.
- O'Donnell, S. and Ramaioli, G. (2004) 'Sustaining an Online Information Network for Non-Profit Organisations: The Case of Community Exchange.' *Paper Presented at the Community Informatics Research Network (CIRN) Conference. Sustainability and Community*

- Technology: What Does this Mean for Community Informatics?* September 29 – October 1, 2004. Prato, Italy.
- O'Donnell, S., McIver, W., J. and Rideout, V. (2006) 'Community media and networking and ICT.' *Paper Presented at the Canadian Communication Association Annual Conference*, June 1-3, 2006. Toronto, Canada.
- O'Donnell, S., Perley, S., Walmark, B., Burton, K., Beaton, B. and Sark, A. (2007) 'Community-based broadband organizations and video communications for remote and rural First Nations in Canada.' *Paper Presented at the Community Informatics Research Network (CIRN) Conference*. November 5-7, 2007. Prato, Italy.
- O'Donnell, S., McIver, W. J. and Rideout, V. (2007) 'Community Intermediary Organizations, Community Media and Networking, and the Internet.' *Paper Presented at the International Communications Association (ICA) Annual Conference*. May 24-28, 2007. San Francisco, USA.
- Pilemalm, S., Hallberg, N. and Timpka, T. (1998) 'From "the good work" to "the good life": a Perspective on Labor Union Visions Regarding Information Technology.' Paper Presented at the Participatory *Design Conference*, November 12-14, 1998, Seattle, Washington, USA.
- Pilemalm, S., Hallberg, N. and Timpka, T. (2001) 'How do Shop Stewards Perceive Their Situation and Tasks? Preconditions for Support of Union Work', *Economic and Industrial Democracy: an International Journal*, Vol. 22, No. 4, pp.569-599.
- Pilemalm S. and Timpka, T. (2002) Using Activity Theory in System Development for Entire Organisations – the Case of the Swedish Trade Union Confederation, *International Journal of Human Resources Development and Management*, Vol. 2, No.3/4 pp.308-328.
- Pilemalm, S. (2002) *Information Technology for Non-Profit Organisations Extended Participatory Design of an Information System for Trade Union Shop Stewards*. PhD Thesis Linköping University, Sweden.
- Pini, B., Brown, K. and Previte, J. (2004) 'Politics and Identity in Cyberspace A Case Study of Australian Women in Agriculture online', In: W. van de *Donk*, B. D. Loader, P. G. Nixon, & D. Rucht (Ed.), *Cyber Protest, New Media, Citizens and Social Movements* (pp 259-275), London: Routledge.
- Plauche, M., Nallasamy, U., Pal, J., Wooters, C. and Ramachandran, D. (2006) 'Speech Recognition for Illiterate Access to Information and Technology.' *Paper Presented at the International Conference on Information and Communication Technologies and Development*. May 25-26, 2006. Berkeley, USA.
- Rideout, V., Reddick, A., O'Donnell, S., McIver, W. J., Kitchen, S., & Milliken, M. (2006). *Community Intermediaries in the Knowledge Society*. Ottawa: National Research Council and the University of New Brunswick.
- Rohde, M. (2003) 'Supporting an Electronic 'Community of Practice' of Iranian Civil Society Organizations', *IADIS International Journal on WWW/Internet*, Vol. 1, No. 2, pp.91-106.
- Rohde, M. (2004) 'Find what binds. Building social capital in an Iranian NGO community system', In: Huysman, M., Wulf, V. (ed.), *Social Capital and Information Technology* (pp 75-112), Cambridge: MIT Press.
- Rusten, E. (2003) *Strengthening Organizations with Information and Communication Technologies (ICTs)* ' In: 'digital opportunities for development: a sourcebook for access and applications', http://learnlink.aed.org/Publications/Sourcebook/chapter2/Strengthening_Orgs_modelofuse.pdf (accessed 9 April 2008).
- Saeed, S., Reichling, T. and Wulf, V. (2008a) 'Applying Knowledge Management to Support Networking among NGOs and Donors.' *Paper Presented at IADIS international conference on E-Society*. April 9-12, 2008. Algarve, Portugal.
- Saeed, S., Rohde, M. and Wulf, V. (2008b) 'ICTs, An alternative sphere for Social Movements in Pakistan: A Research Framework.' *Paper Presented at IADIS international conference on E-Society*. April 9-12, 2008. Algarve, Portugal.

- Saidel, J., and Cour, S. (2003) 'Information technology and the voluntary sector workplace', *Nonprofit and Voluntary Sector Quarterly*, Vol. 32, No. 1, pp.5-24.
- Shamail, S., Awais, M.M., Masud, S. and Shams, S. (2003) 'Web Based Portal for Capacity Building of Development Sector Enterprises in Pakistan' *Paper Presented at the 2nd World Scientific and Engineering Academy and Society (WSEAS) Conference on E-Activities, December 7-9, 2003*. Singapore.
- Shamail, S., Awais, M.M., and Hussain, T. (2005) 'A Collaboration Portal for Social Enterprises.' *Paper Presented at International Conference on Web Technologies, Applications, and Services, July 4-6, 2005*. Calgary, Canada.
- Sherwani, J., Ali, N., Mirza, S., Fatma, A., Memon, Y., Karim, M., Tongia, R. and Rosenfeld, R. (2007) 'HealthLine: Speech-based Access to Health Information by Low-literate Users.' *Paper Presented at the International Conference on Information and Communication Technologies for Development. December 15-16, 2007*. Bangalore, India.
- Surman, M. and Reilly, K. (2003) *Appropriating the internet for social change: towards the strategic use of networked technologies by transnational civil society organizations* social science research council Obtained through the Internet: http://programs.ssrc.org/itic/publications/knowledge_report/final_entire_surman_reilly.pdf [accessed 04/09/2008].
- Stehr, N. (2007) 'Societal transformations, globalization and the knowledge society', *Int. J. Knowledge and Learning*, Vol. 3, No. 2/3, pp.139-153.
- Sterling, S., R., O'Brien, J. and Bennett, J., K. (2007) 'Advancement through Interactive Radio' *Paper Presented at the International Conference on Information and Communication Technologies for Development. December 15-16, 2007*. Bangalore, India.
- Trench, B., and O'Donnell, S. (1997) 'The Internet and Democratic Participation: Uses of ICTs by Voluntary and Community Organizations in Ireland', *Economic and Social Review*, Vol. 28, No. 3, pp.213-235.
- Trigg, R. H. (2000) 'From Sandbox to "Fundbox": Weaving Participatory Design into the Fabric of a Busy Non-profit.' *Papere Presented at Participatory Design Conference Palo Alto, CA, USA November 28 –December 1st 2000*.
- Van Aelst, P. and Walgrave, S. (2004) 'New media, new movements? The role of the internet in shaping the anti-globalization movement', In: W. van de Donk, B. D. Loader, P. G. Nixon, & D. Rucht (Ed.), *Cyber Protest, New Media, Citizens and Social Movements* (pp 97-122), London: Routledge.
- Veeraraghavan, R., Yasodhar, N., and Toyama, K. (2007) 'Warana Unwired: Replacing PCs with Mobile Phones in a Rural Sugarcane Cooperative.' *Paper Presented at the International Conference on Information and Communication Technologies for Development. December 15-16, 2007*. Bangalore, India.