Abstract

The complexity and interconnectedness of current working environments encourages organizations, businesses and individuals to collaborate beyond spatial, temporal as well as organizational boundaries. These collaborations are potentially supported by *information and communication technology* (ICT) among mobile and ubiquitous systems. The academic field *Computer-Supported Cooperative Work* (CSCW) is primarily recognized for focusing on ICT support for collaboration *practices* as opposed to the computerizing of *formal procedures*. ICT, in this view, needs to reflect the dynamic nature of cooperation and collaboration. The notion *emergence* as coined by Lewes (1875) and interpreted by Goldstein (1999) refers to dynamic contexts that cannot be anticipated in their full extent before they actually occur. *Emergent collaboration* refers to the need for spontaneous collaboration in novel and changing structures and occurs in application fields such as inter-organizational crisis and emergency management, which by definition contain the unforeseeable.

This dissertation contributes to research into *infrastructures for emergent collaboration*. Using the example of crisis management, it addresses (1) emergent collaboration practices and how they reveal work infrastructure limitations, (2) novel concepts and artifacts to support emergent collaboration, (3) their effects on the ability to deal with emergent situations and (4) methodological implications for technology design for emergent collaboration infrastructures in inter-organizational settings.

Design case studies (Wulf et al., 2011), inspired by *action research* (Lewin, 1958) and following Hevner and Chatterjee's suggestion (2010) to integrate action research with *design research,* are applied as a practice oriented research method. They contain three phases: an empirical analysis of the practices in the field, the development of innovative ICT artifacts with continuous participation of end-users related to the empirical findings and the evaluation of their appropriation (Pipek, 2005) in practice. In the case reported here, the empirical study on emergent collaboration by police and fire services, aid agencies, energy network operators and citizens in emergencies in two counties in Germany outlined the importance of improvisation work in situation assessment as well as mobile collaboration and reporting practices. The ICT design aimed towards the support of these emergent practices, illustrated by various concepts and prototypes. They comprise (1) an inter-organizational social network for emergency management (SiRena), (2) an inter-organizational situation assessment client (ISAC) as well as mobile applications for (3) the ad hoc participation in mobile collaboration (MoCo) and (4) the articulation of information needs in mobile reporting (MoRep).

Based on the empirical, technical and practical findings, the subsequent analysis uses the concept of *infrastructuring* (Pipek & Wulf, 2009), the integrated perspective on the design and use of information systems, and derives implications for emergent collaboration infrastructures, which contribute overall to the academic fields CSCW, *Human Computer Interaction* (HCI) and *Information Systems* (IS).

Springer