Operative vs. Technical Role Management in Emergency Organizations

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ABSTRACT

Operative role management relates to delegating the right roles to the right resources at a specific moment. Role management is commonly understood as technical role management, relating to access control and administrative role management. Operative role management is the practical daily work of emergency organizations’ personnel and relates to overall resource management. The authors have carried out in-depth ethnographic research on the topic and distinguish the difference between operative and technical role management. The research for this paper concentrates on the practical work processes of the emergency management staff and not merely on the information systems and their functionalities. They focus on describing the interdependencies between the two role management approaches with examples from our field studies and findings from literature.

Keywords: Access Control, Command and Control, Operative Role Management, Role, Role Management

INTRODUCTION AND BACKGROUND

Commonly, role management refers to an organization’s capability to manage in the roles each employee performs as part of his or her job functions. In technological terms, role management relates to managing access control/authorization and specifying the resources the users are allowed to access in an application or computer system (Aedo, Diaz, & Sanz, 2006; Al-Kahtani & Sandhu, 2002; Ferraiolo, Kuhn, & Chandramouli, 2007). RBAC (Role-Based Access Control) regulates the access to resources and computer system objects based on the roles defined in an organization (Sanz, Aedo, Diaz, & de Castro, 2006; Ferraiolo, Kuhn, & Chandramouli, 2007). The key RBAC hypothesis is that roles and related responsibilities are much more persistent than users (Sanz et al., 2006; Aedo et al., 2006). After the responsibilities of an organization are defined, they rarely change. Usually, what changes is the user or users that work with a specific responsibility in a specific situation. Much of the research is based on RBAC, its mechanisms and extensions (Sanz, Gómez Bello, Diaz, Sainz, & Aedo, 2007; Haibin & MengChu, 2006; Aedo et al., 2006; Tahir, 2007), such as context-aware dynamic access control (Kim et al., 2005; Zhang &
Parashar, 2004) or attribute-based user-role assignment (Al-Kahtani & Sandhu, 2002).

In multi-authority emergency situations where collaboration between authorities emerges, it is often necessary to share information within or between organizations. The organizations have implemented various information and communication systems to support the activities in the command and control rooms as well as in-the-field actions (Mehrotra, Butss, Klashnikov, & Venkatasubramanian, 2004; Sanz et al., 2007; Smirnov, Pashkin, Levashova, Shilov, & Kashevnik, 2007). The information technology challenges focus on the systems and procedures to get the right information to the right person at the right time (Sanz et al., 2007; Ianella & Henricksen, 2007). RBAC can be used to control information sharing in the systems and solve some of the information sharing obstacles. However, RBAC still requires improvements to function in a dynamic environment. Moreover, challenges are caused by relatively low integration of information and communication technologies in the emergency management field (Wybo & Lonka, 2002).

According to Haibin and Mengchu (2006), role-based collaboration is a recent innovation, which pays attention to how productive collaborations can be maximized by manipulating role assignments and the configuration of teams. It is a new methodology for organizing collaboration by providing role specification, assignment, transition, and negotiation mechanisms. With these mechanisms, people in collaboration are clear about their roles, thereby making collaboration more productive. Operative role management focuses in particular on the command and control activities of an emergency organization (Kurki & Sihvonen, 2012; Sihvonen & Kurki, 2010). It refers to managing the different roles that personnel can dynamically assume during an emergency situation. In emergency organizations, roles vary from operative field roles to tactical and strategic command, control and coordination roles and to administrative roles. Role transfers take place dynamically several times during emergency situations and shifts, and are largely based on verbal communications and face-to-face briefings. Even though a human user in collaboration cannot be physically changed, his/her role in collaboration may be changed (Sanz et al., 2006). In their work, Ianella and Henricksen (2007) describe how in a small incident one person could undertake the role of incident controller as well as the tasks of planning, operations, and logistics; in a medium-sized incident a person can be required in each of the four roles; and in a major incident dozens of people may be required to handle the various management functions. Role management is challenging, as a change in one role can initiate a series of role changes within and across organizational boundaries when forming situation-organizations (Zhu & Zhou, 2006).

Role management at the information system level and the management of real-world roles are interdependent activities, which have not been effectively acknowledged. Command and control as well as field activities affect both information system role management and access control. The research for this paper concentrates on the practical work processes of the emergency management staff and not merely on information systems and their functionalities. The purpose of this paper is to address this interdependency and to illustrate how technical and operative role management are activities that go hand in hand.

RESEARCH METHOD AND SETTINGS

Research Context and Objectives

Social science and information technology approaches provide a multidisciplinary approach to studying the operational and technical role management issues in real-life emergency operations (Wybo & Latiers, 2006; Mehrotra et al., 2004). In their research, Wybo and Latiers (2006) have presented a theoretical approach to studying emergency situations. The approach is multidisciplinary. Emergency situations can be studied as complex and collective work situations. First, the socio-organizational dimension should be noted, covering organizational...
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