Achieving Shared Understanding in Face-to-Face 'Tabletop' Exercises

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Shared understanding plays a key role within the emergency-planning context to successfully develop planning tasks. Particularly in 'tabletop' exercises, such an understanding is required to make decisions about planning. However, as the task progresses, the amount of relevant knowledge that a planner can remember about the task progressively decreases. This fact can impose a limit on the task progress. With the purpose of overcoming such a limitation, this work presents a computer-based face-to-face collaborative tool aimed at supporting 'tabletop' exercises.

Emergency planning. Tabletop exercise. Shared understanding. Face-to-face. Collaborative tool

1. INTRODUCTION

'Tabletop' exercises are commonly understood as brainstorming or group discussions that take place around a physical table (Trnka and Jenvald, 2006). Within the emergency-planning context, 'tabletop' exercises allow discussing strategies and constraints in order to design emergency plans (Carroll et al., 2008). To that end, participants gather around a table bring different and often controversial points of view, allowing them to create a shared understanding about the problem. This shared understanding helps planners to negotiate tasks, evaluate alternatives, and make decisions. However, as the task progresses, the shared understanding of the task continually grows and, consequently, the amount of crucial knowledge that users must carry in their minds as tacit knowledge. Since the amount of knowledge that an individual can possibly remember is limited, this fact imposes a limit on progress in design. Overcoming this limit through computer-supported technologies is a central challenge (Arias et al., 2000). Consequently, several works have been so far conducted within the emergency-planning context to support 'tabletop' exercises through computer-based tools (Carroll et al., 2008; Schafer et al., 2007; Convertino et al., 2007). Nevertheless, these works have been mainly focused on distributed collaborative approaches. With the aim of assisting face-to-face discussions, this paper presents a collaborative tool that supports 'tabletop' exercises relied on using an interactive surface to assist the exchange of knowledge and the creation of shared understanding.

2. SUPPORTING FACE-TO-FACE TABLETOP EXERCISES

The solution has been conceived as a co-located collaborative tool oriented to be deployed on a multi-touch screen. The environment, as Figure 1 shown, allows participants to share their knowledge and experiences around a table by using digital knowledge representations and direct interaction styles. Following paragraphs explain the main features of the system.

Figure 1: Co-located collaborative tool to support 'tabletop' exercises

Role-based collaboration

Emergency planning is an on-going process to ensure preparedness in emergency situations (Perry and Lindell, 2003). The emergency-planning process involves a multidisciplinary team of experts who collaborates in the definition of preparation strategies and response procedures. Different kind

of experts involves different expertise and responsibility and, consequently, different interaction roles. These interaction roles are supported through the use of role-based toolbar menus. As shown in Fig. 1, each user disposes of a personalized instance of the toolbar menu in front of his/her position, next to the side of the interactive surface. Each toolbar provides common tools and role-specific information. Common tools are intended to ease the involvement of participants through the use of different annotation tools. On the other hand, role-specific information provides specific information for the role, such as the list of his/her own available resources.

Figure 2: Tool bars to support multidisciplinary

As Figure 2 shows, toolbars are different coloured depending on the role. This feature allows group members to be aware of other roles and their involvement in tasks.

Geocollaboration

Emergencies are inherently local: they occur in a particular place and have a direct impact on a geographically delimited community. Thus, the geospatial information plays a key role in emergency-planning process (Convertino et al., 2007). Planners commonly use geospatial representations to discuss geographical challenges and to document aspects of the plan like the physical location of resources or the definition of routes, and other emergency issues.

Figure 3: Collaborative map to provide geospatial information

A common way to communicate geospatial information is through the use of maps. Hence, the system provides a digital collaborative map that assists discussions. Planning members can digitally annotate on the map to ease the understanding of tasks and alternatives. Figure 3 shows how the digital collaborative map includes planning information such as the available resources (marked in green) and the defined routes (marked in red).

Multiple views

Geospatial representations often require different views to provide specific and relevant information for the task. As an example, a street view, including highways and street data, can be helpful to find a postal address or to define evacuation routes, but not to find a specific building or construction. The system allows changing between different views. Each view provides different information that can assist different tasks. Figure 4 shows how the same area can be displayed with different views.

Figure 4: Multiple views to show relevant information for tasks

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5. REFERENCES

- Arias, E., Eden, H., Fischer, G., Gorman, A., Scharff, E. (2000) Transcending the individual human mind -creating shared understanding through collaborative design. *ACM Transactions on Computer-Human Interaction*, 7, 1, 84-113
- Carroll, J. M., Mentis, H., Convertino, G., Rosson, M. B., Ganoe, C. H., Sinha, H., Zhao, D. (2007) Prototyping collaborative Geospatial Emergency Planning. *ISCRAM*, Delf, May 13-16, 105-113
- Convertino, G., Zhao, D., Ganoe, C. H., Carroll, J. M., Rosson, M. B. (2007) A Role-Based Multiple View Approach to Distributed Geo-Collaboration. *Human-Computer Interaction. HCI Applications and Services*, 4553, 561-570
- Perry, R. W., Lindell, M. K. (2003) Preparedness for emergency response: guidelines for the emergency planning process. *Disasters*, 27, 4, 336-350
- Schafer, W. A., Ganoe, C. H., Carroll, J. M. (2007) Supporting Community Emergency Management Planning through a Geocollaboration Software Architecture. *Computer Supported Cooperative Work (CSCW)*, 16,4-5, 501-537
- Trnka, J., Jenvald, J. (2006) Role-playing Exercise – A Real-time Approach to study Collaborative Command and Control. *International Journal of Intelligent Control and Systems*, 11, 4, 218-228