Chapter 4.8
Web-Based Group Decision Support for Crisis Management

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ABSTRACT

The early designs for crisis management decision support systems used data-based or model-based methodologies and architectures. We argue that the complexity of crisis management situations means that a greater emphasis on collaboration is needed. Moreover, modern interactive Web 2.0 technologies allow group decision support to be offered to geographically dispersed teams. Given that crisis management often requires teams to be drawn together from a number of organisations sited at different locations, we reflect upon the potential of these technologies to support the early stages of crisis management without the need to draw the team together at a common location. We also report on a small scale experiment using GroupSystems ThinkTank to manage an emerging food safety event. We conclude that such systems have potential and deserve more careful evaluation.

INTRODUCTION

In this article we explore current developments in web-based group decision support systems (*w*GDSS), asking how and whether they can support the development of strategy for teams of geographically dispersed crisis managers. Our concern is that the use of any group decision support system (GDSS), web-enabled or not, requires a common understanding of the system and shared mental models so that the group can interact consistently and draw the same messages to inform the crisis management process. Will this be possible if the group are spatially dispersed and perhaps have never met face-to-face? In the

following we discuss these issues in greater detail and describe an exploratory experiment in which we simulated the management of a crisis relating to food safety using a *w*GDSS.

When Gorry and Scott Morton (1971) first defined decision support systems (DSS) *per se*, they recognised that some systems would support unstructured decision making: DSS were "interactive computer-based systems, which help decision makers utilise data and models to solve unstructured problems". Notwithstanding this, the majority of early DSS focused on supporting well structured operational decisions[1]. They were built on data-based information providing or model-based prediction, simulation and evaluation architectures, both of which do little to support decision making in highly unstructured circumstances (for examples of such architectures see, e.g., Mallach, 2000). However, foreshadowed by decision analysts working to support strategic decisions, often the responsibility of groups of decision makers, more flexible, less structured, group enabled DSS tools were developed (see, e.g., Clemen & Reilly, 1996; DeSanctis & Gallupe, 1987; Eden & Ackermann, 1998; Eden & Radford, 1990; Nunamaker, Briggs, Mittleman, Vogel, & Balthazard, 1996; Phillips, 1984). Some of these tools were designed to work with groups in plenary decision conferences; others allowed individual group members to interact via networked computers sited in group decision support rooms (French & Xu, 2004; Morton, Ackermann, & Belton, 2003). Currently the use of web-technologies is enabling the development of group decision support for dispersed groups of decision makers facing unstructured strategic decisions.

Individuals working together divide their efforts between three cognitive processes (Nunamaker et al., 1996):

- **Information processing:** storing, retrieving analyzing and summarizing the data needed to support group deliberations.
- **Communication:** people devote their attention to choosing words, behaviours, images, and artefacts, and presenting them through a medium to the others in the group.
- **Deliberation:** people devote cognitive effort to forming intentions toward accomplishing a goal, including clarifying and formulating the problem, developing and evaluating alternatives, choosing, monitoring, and so on.

When responding to a crisis, a team must bring together the right information, expertise, and leadership ability, and work under time pressure (Briggs, Nunamaker, & Sprague, 1997/1998). In the public sector, crisis teams are often drawn together from several organizations and thus at the outset of an incident, have to come together and form before they can function effectively (Carter & French, 2005). These people must continuously develop and evaluate possible courses of action in response to the unfolding situation – a situation which by its very nature may be entirely unanticipated, very complex and require creative solutions if it is to be managed effectively. This suggests that collaborative systems that support dispersed teams of decision makers could have a significant role in managing crises. Web 2.0 technologies offer many opportunities for developing such support. *ThinkTank* developed by *GroupSystems* is a *w*GDSS offering support for these processes. *ThinkTank* employs a Web 2.0 architecture to support techniques such as brainstorming, organizing ideas, voting on alternatives, prioritizing, building consensus, etc. It also creates a clear, custom output of the content created during the innovation process for alignment on action or for future reference.

In the next section we review general GDSS in a little greater detail before discussing current developments in *w*GDSS. We emphasise some the benefits and challenges that relate the behavioural aspects of groups. Following that we discuss an experiment based on the use of *ThinkTank* to sup-