

: How can DSS help in crisis planning, response and management?

This Ask Dan! is a follow-up to a column written in August 2003. My goal is to discuss "some of the more creative and practical things we can use from the DSS area to improve the capability for all phases of emergency preparedness and management". My colleague Prof. Murray Turoff initiated my thinking about the broad possibilities for Decision Support Systems in crisis situations when he invited me to participate in the Second International Conference on Information Systems for Crisis Response and Management (ISCRAM 2005).

For a number of years, I have been investigating the current state of crisis management practice. But for more than two months I have been pondering what might be possible in terms of building innovative DSS for crisis situations. I used Google to identify articles and case studies, but more importantly I have searched for definitions and explanations of the term "crisis" and "crisis management". From my perspective it is important to identify some shared characteristics of "crisis" situations where it may be helpful to introduce additional decision support and information technologies. Also, conceivably some categorization of the various situations and of the process of crisis planning, response and management can help sort and organize our thinking about the various DSS possibilities.

According to the Munich Research Group website, most definitions of the term "crisis" include ten characteristics: 1) an unusual volume and intensity of events, 2) 'change of state' in the flow of international political actions, 3) disruptive interactions between two or more adversaries, 4) abrupt or sudden change in one or more basic system variables, 5) change in the external or internal environment, 6) threat to basic values, 7) high probability of involvement in military hostilities, 8) awareness of finite time for response, 9) surprise and 10) uncertainty.

At the Carnelian International Risks website the focus is on risk management. The site notes "The term Crisis is a complex proposition; since the word crisis will truly have different implications for different individuals and organisations. In reality the definition of crisis will vary depending on the constructs, limitations and perceptions of the crisis situation. What is important to recognise is that crisis events are not limited to, or defined by executive kidnappings, hijackings or product tampering, but by salient environmental variables that shape the situation into a crisis event for an organisation."

Further Carnelian consultants state, "The definition of crisis is dependent on the: Perceived value of possible losses; Perceived probability of loss; Perceived time pressure involved." This is a business and private sector view of crises. On a more general note, Carnelian consultants argue "What must be made clear when discussing crisis events is that the organisation's perception of the crisis is equally important when managing crisis, since these factors have a dramatic effect on problem solving and decision making. Furthermore, an organisation's perception of crisis is littered with a number of additional problems that range from the intrinsic cognitive biases of its executives, negative emotional affect and rigid organisational systems such as contingency planning. These factors if mismanaged will have a detrimental effect on the outcome during crisis management."

Al Tortorella of Ogilvy Public Relations Worldwide identified eight characteristics of corporate crises. The eight characteristics are: "1) surprise that is always driven by media exposure; 2) insufficient information about the relevant facts and the emerging public perception of the issue; 3) escalating flow of events that hampers the ability of management to understand quickly that, like it or not, they 'own' the problem and must quickly articulate a persuasive response; 4) loss of control over the way

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the growing crisis is perceived and the impact it is beginning to have on the company; 5) intense Scrutiny from outsiders/insiders including media, government, regulatory agencies, activist groups, key stakeholders, and most importantly, the management team itself; 6) the beginning of the siege mentality that causes company leadership to attempt to 'hide' behind the legal aspects of the crisis, rather than confront the central issues, and thereby allows the crisis to inflict more damage on the organization; 7) panic that perverts and/or paralyzes the decision-making process; and 8) the issue is solved by the public arena in a manner designed to satisfy the interests of outsiders—including the media, government, regulatory agencies and activist groups—but never the interests of the company itself."

John Reh differentiates a crisis from a disaster. He argues "A crisis and a disaster are both bad for your business, but they are very different. A disaster is an event that results in great damage, difficulty, or death. A crisis is a situation that has reached an extremely difficult or dangerous point. A flood is a disaster. You should have prepared for that potential. Then you can deal with it according to your plan. A major product recall, such as Firestone has recently encountered with its SUV tires, is a crisis. Sometimes it is hard to know whether you are really in a crisis, but failure to handle a disaster properly can lead to a crisis."

The Institute for Crisis Management (crisisexperts.com) website notes "The most effective crisis management occurs when potential crises are detected and dealt with quickly--before they can impact the organization's business. In those instances they never come to the attention of the organization's key stakeholders or the general public via the news media."

Finally, the Food Safety Network at the University of Guelph (<http://www.foodsafetynetwork.ca/>) has a Crisis Response and Communication Planning Manual online prepared by Sarah Grant and Douglas Powell. They identify 3 stages of crisis management: prevention, preparedness, and recovery. They note that crisis prevention involves monitoring, anticipation and taking preemptive actions to avert a crisis. Prevention is most problematic, difficult and expensive for low probability events. Crisis prevention activities can reduce threats. Crisis preparation involves taking actions to reduce the impact and harm from a crisis when and if it should occur. It is important to identifying vulnerabilities and crisis scenarios. Planners need to identify what might go wrong and what the consequences would be if the worst case situation occurred. Finally, crisis recovery involves "assessing the damage and rebuilding the company reputation after the crisis".

So what help can DSS provide in a crisis situation?

If we know what data to collect, data-driven DSS can help monitor the "volume and intensity of events", "abrupt or sudden change", "insufficient information" and changes in the "external or internal environment" of an organization. If we have built appropriate planning models for model-driven DSS, those computerized systems can help reduce or manage uncertainty. Both model-driven and data-driven DSS can support crisis prevention activities. Also, model-driven DSS can help identify vulnerabilities and evaluate crisis scenarios. Potentially, communications-driven DSS can reduce the negative effects of time pressure in a crisis situation. Web-based, document-driven, group decision process structuring applications can improve contingency planning and action decisions during crisis preparation.

Web portals and web-based DSS can help monitor news and events and help organizations share information with the media, stakeholders and the general public.

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Knowledge-driven DSS can potentially assist in understanding the "constructs, limitations and perceptions of the crisis situation". Also, computerized DSS may help reduce cognitive biases during crisis management tasks. How values and preferences are elicited can impact their accuracy and how information is displayed in a DSS alters a decision maker's perception in a situation.

Improved communications technologies and handheld and portable computing technologies make it possible for first responders to bring decision support technologies into a crisis management setting whether that is in a nearby hotel room, a tent or at the scene of an incident. A commander at the scene of an incident or crisis can conceivably have access to the entire range of DSS.

Can computerized decision support help deal with "surprise", "loss of control" and "panic" in crisis situations?

Perhaps. A robust decision support infrastructure and appropriate training for response teams in the use of computerized decision support technologies should reduce the psychological stress associated with crisis situations. Crisis responders need to practice using decision support technologies in realistic scenario situations.

We will continue to encounter surprises that are both positive and negative. It is not possible and won't be possible to anticipate every crisis situation that an organization or government might encounter. That should not keep us from trying to anticipate crisis situations. Potentially document-driven DSS can store scenarios, plans, and situation analyses. Knowing that a starting point may exist for rapid response can and should reduce the sense of surprise. Even low likelihood events can be explored. We can also ask the hard, troubling questions of crisis management. What if the computer systems fail? What if the data collected was inaccurate? What if the crisis is very serious and it was not anticipated? What if communications systems are not working? Are current plans too dependent upon information technologies for crisis management and response?

My general guidance for building computerized decision support systems is anchored in Murphy's Laws and Corollaries: "Anything that can go wrong will go wrong"; "Everything takes longer than you think"; and "Nothing is as easy as it looks". I think the same wisdom holds true for crisis situations. Nevertheless, we must persist in building and using decision support and information systems to help people in crisis planning, response and management. As always your comments and suggestions will be much appreciated.

References

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