

Decision Graphs: Managing Decisions for Emergencies

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ABSTRACT

Emergencies are highly complex situations that require careful consideration of information collected from a variety of sources, by a variety of individuals and agencies. Good situation awareness provides the basis for a highly effective decision-making process requiring large volumes of real time information. Processing this is a highly complex task, and the dynamic nature of emergencies introduces further challenges. Over the years, several initiatives have attempted to address this complexity by proposing a variety of solutions that have contributed to a growing field of research. While progress toward decision-making support has been significant, the process of managing decisions has received less attention. To learn from decisions, there needs to be a process of collecting, curating and analyzing decision-making itself. Information being collected via a large number of resources needs to be formalized and interpreted by the decision maker, who in turn combines the information collected with their own knowledge and experience to make critical, and often life-saving decisions. Many of the decisions need to be taken instantaneously, while some need careful consultation and consideration, in collaboration with experts only once good situation awareness is achieved. This process of taking decisions based on evidence and personal experience is often lost, mostly due to lack of appropriate archiving mechanisms (e.g. not digitizing paper-based decisions or recording informal decisions). Therefore post-event analysis and auditing activities can lose track of how decisions were made, their associated evidences and rationale. Recording decisions in real-time, as they are taken, can provide a step change in the way decision support systems can aid future events or post-event analyses. We address this aspect of decision support by proposing a real-time decision capture and monitoring approach, Decision Graphs. At the core of Decision Graphs resides a decision management framework, employing semantic web techniques to organise decisions, as and when they are taken. While Semantic Web approaches have been employed in the past in Decision-Making for Emergency Response, management of decisions using Semantic Technologies has been largely limited. Lightweight decision loggers are deployed in a variety of ways – mobile applications available for all types of mobile devices, web browser-based plugins, and a dedicated web site. The decision loggers capture decisions and all related evidence and rationale from the decision maker, and make them available to the decision management framework. Following an event, a decision maker can then retrieve all decisions via a web-based solution. In this poster, we first present requirements gathered from interviews with a variety of stakeholders. We then address this need and propose a decision management framework that employs a variety of pervasive lightweight decision loggers and semantic web technologies for enriching and organizing decisions. Finally, we present our visualisation mechanisms to help look up events and decisions, during follow-up post event analyses activities.

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