Shared situational awareness as a systems-level phenomenon: applying propositional networks to shared awareness in teams

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Abstract

Previously, work has sought to demonstrate how shared or overlapping individual mental models could be used to describe 'shared situational awareness' amongst a team of individuals. It is argued that such an approach is difficult to apply and potentially misleading. For example, gaining access to the individual mental models and then developing a means by which they could be shown to overlap requires a level of data collection and analysis that could be extremely challenging. In the present paper a more parsimonious approach is offered that assumes a 'systems level' view of the situation that can be ascertained through the observation of the utterances and behaviour of team members together with input from subject matter experts and represented as a propositional network model. Upon this network model one can then represent incidences when 'knowledge objects' are shared and used over different phases of a scenario. The approach is illustrated with examples taken from an example of a Fire Service training exercise.

Introduction

The advent of modern electronic networking technology, such as the internet, and the related development of military concepts such as Network Enabled Capability (NEC, see MoD 2004) has given rise to interest in 'Shared Situational Awareness' (SSA). The general notion appears to be that through the use of networked systems the members of geographically or functionally distributed teams will be able to have a common view of the situation (e.g., through a Common Operational Picture) and so arrive at a shared understanding of the situation that will enable improvements in the quality and speed of decision making (e.g., see MoD 2004 for a description of a "benefit chain" relating technology to decision making via SSA). In terms of cognitive psychology and philosophy of mind, there are a number of highly problematic assumptions underlying this notion of 'shared situation awareness'. While this paper is not the place to debate all of these problems, it is worth asking whether there can be a 'common view' of a situation for distributed participants. Normally, this is dealt with simply through the provision of a map of the terrain with markings to indicate locations and movements of entities. At this level, it could be

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