

# Representing Distributed Situation Awareness: a case study in Multi-National operations

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## Abstract

The concept of Distributed Situation Awareness (DSA) is currently receiving increasing attention from the human factors community. Despite this, some researchers argue that theory and methods for representing SA in collaborative systems are lacking. This article describes a DSA approach to viewing SA in collaborative systems and outlines the propositional network method, a new methodology for evaluating and representing DSA. To demonstrate, examples taken from a recent case study on DSA in multinational warfare operations are presented. The findings are discussed in relation to their implications for DSA during the multinational operations observed, including the structure of DSA in terms of the usage of knowledge by the different agents involved, the distribution and sharing of knowledge between agents, and the salience of the different knowledge items identified.

## Introduction

Interest in Situation Awareness (SA) continues to expand. Ostensibly, SA refers to the awareness that an individual has of a situation, an operator's dynamic understanding of 'what is going on' (Endsley, 1995). Of the SA theories presented in the literature, Endsley's information processing based three-level model is the most popular. The three-level model, depicts SA as a *product* comprising three hierarchical levels: *level 1*, the perception of task relevant elements in the environment; *level 2*, the comprehension of their meaning in relation to task goals; and *level 3*, the projection of their future states. Interest in the concept of *team SA* has increased markedly over the past decade. Endsley's model has subsequently been applied to team SA in a wide variety of domains, including the military (e.g. Endsley, Holder, Leibright, Garland, Wampler & Matthews, 2000). Much, however, has been written on the need for a greater understanding of team SA during collaborative activity and for the development of more sophisticated SA measures for collaborative systems (e.g. Artman and Garbis, 1998; Salmon, Stanton, Walker and Green, 2006; Siemieniuch & Sinclair, 2006). In this article we describe an