Chapter VI

An Empirical Comparison of Collective Causal Mapping Approaches

Huy V. Vo
Ho Chi Minh City University of Technology, Vietnam

Marshall Scott Poole
Texas A&M University, USA

James F. Courtney
University of Central Florida, USA

Abstract

Recently, capturing and evaluating group causal maps has come to attention of IS researchers (Tegarden and Sheetz, 2003; Lee, Courtney & O’Keefe, 1992; Vennix, 1996; Kwahk and Kim, 1999). This chapter summarizes two studies that formally compare three approaches to building collective maps: aggregate mapping, congregate mapping, and workshop mapping. We first provide a conceptual comparison of the three methods. Then we empirically compare models derived with the three methods using both objective and subjective measures. The results suggest that the aggregate method performs best at the group level, whereas the congregate method performs best at the organizational level. The results also indicate that the workshop method was best...
at promoting knowledge sharing. These studies suggest that the workshop method can be used in combination with aggregate mapping or congregate mapping methods to improve the collective mapping process.

**Introduction**

Research on causal mapping has been an active area in information systems (IS) research. Causal mapping has been applied in information systems requirements analysis (Montazemi and Conrath, 1986) and for planning network services (Dutta, 2001). Boland, Tenkasi & Teeni (1994) argue that causal mapping can be used to capture subjects’ perspectives for use in decision making, system design, and other activities. Several information systems have been designed to support causal mapping (Eden, 1989; Zhang, Wang & King, 1994; Boland, Tenkasi & Teeni, 1994; Kwahk and Kim, 1999; Hong and Han, 2002). Sheetz, Tegarden, Kozar & Zigurs (1994) proposed a group support system as an aid in uncovering causal maps of users.

Developing and evaluating group or collective causal maps has been the subject of several recent IS studies (Tegarden and Sheetz, 2003; Lee, Courtney & O’Keefe, 1992; Vennix, 1996; Kwahk and Kim, 1999). Ackerman, Eden & Williams (1997), Massey and Wallace (1996) and Vennix (1996) have maintained that collective maps can be used to broaden problem solvers’ perspectives by taking alternative views into account in the definition of a messy problem situation. In their view collective maps can be viewed as a means to access multiple perspectives for problems with no definitive formulation. This is a particularly important application, because several researchers (Checkland, 1981; Courtney, 2001; Linstone, 1984; Mitroff and Linstone, 1993; Senge, 1990) have proposed that systems-based multiple perspective approaches are required to deal with problems in organizations and society today. Different perspectives are assumed to hold different models, and it is through the juxtaposition and combination of models that perspectives can be mediated. To gain the precision necessary to compare, contrast, and combine multiple perspectives, it is necessary to build models of the situation. However, it is by no means straightforward to develop group or collective maps. Tegarden and Sheetz (2003) found that merging causal maps of individuals into a collective causal map has been problematic and argued that the creation of collective causal maps is impractical for many organizational situations.

The research reported in this chapter focuses on the use of modeling to mediate multiple perspectives on problems through the development of group causal maps. We focus on the comparison of existing modeling approaches that are capable of representing multiple perspectives through collective maps. Our research questions are: What approaches are available to formulate collective causal maps based on multiple perspectives? Are some approaches superior to others?

This chapter has three objectives. First, it discusses and compares at a conceptual level three methods of constructing collective causal maps. These three approaches represent fundamental distinctions in methods of collective causal mapping and each has some track record of success. Second, it reports the results of two studies conducted to
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