Chapter X

Asynchronous and Distributed Multi-Criteria Decision Making Using a Web-Based Group Support System

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ABSTRACT

A detailed model for designing a Web-based Multi-Criteria Group Support System (MCGSS) is presented. The model is based on the Analytic Hierarchy Process (AHP) and uses the intensity of preferences of group members rather than simple voting procedures. This approach offers several advantages over simple voting mechanisms, including a much richer picture of both individual and group positions and more equitable decision-making. A prototype system, with a user-friendly graphical user interface (GUI), has been developed and used to analyze an experimental group decision process over the Internet.
This permits a wider range of users, including those with limited typing skills, asynchronous communication across many time zones, and a larger number of participants than conventional systems. An agenda for further research is outlined.

INTRODUCTION

Groups have no doubt been making decisions since prehistoric times. From early diagrams in mud or sand, groups have moved to flip charts and erasable white boards. But these innovations have not really changed the process. Group Support Systems (GSS) offer the potential of new ways for groups to work together, but most reported usage is still for systems that simply supplement face-to-face meetings. The computer screen has replaced lines in the sand, and enforced structures (e.g., facilitators, agendas, brainstorming, and voting) that well-organized groups have always used. But there is no fundamental difference in the process.

Hammer (1990, p. 104) argues that we need to re-engineer the workplace, not simply automate existing procedures. “Instead of embedding outdated processes in silicon and software, we should obliterate them and start over.” The same argument can be applied to the group decision-making process. There is a clear need for GSS that can effectively support larger groups working asynchronously. This type of system does not need to be more effective than face-to-face meetings to be valuable (Fjermestad & Hiltz, 1998). Because of the high costs of bringing people together, and the time lost in doing so, a system that allows them to be consulted remotely offers considerably more value than most GSSs studied so far.

Research in GSS has concentrated on two main streams: (1) the design and evaluation of features and technology; and (2) the effects of the technology on group decision outcomes and processes (Williams & Wilson, 1997). This paper belongs to the first of these categories, providing a more theoretically sound and richer voting procedure that should be well-suited to decision-making over the Internet. Our main focus is the design issues of the GSS, which must be addressed before more meaningful research on the decision-making process can be undertaken (Fjermestad & Hiltz, 1998). An Internet-based asynchronous GSS, allowing global participation and using the intensity of preferences, operates in a profoundly different way from traditional face-to-face meetings. The more sophisticated voting mechanism should help address the communication and cultural issues that face global virtual teams (Dubé & Paré, 2001). Participants can articulate their positions in considerably more detail, allowing consensus to be measured on more levels than simply the preferred alternative. Some future research opportunities are outlined in this paper.
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