Chapter VII
Engineering Mobile Group Decision Support

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ABSTRACT

This chapter investigates the potential of mobile multimedia for group decisions. Decision support systems can be categorized based on the complexity of the decision problem space and group composition. The combination of the dimensions of the problem space and group compositions in mobile environments in terms of time, spatial distribution, and interaction will result in a set of requirements that need to be addressed in different phases of decision process. Mobility analysis of group decision processes leads to the development of appropriate mobile group decision support tools. In this chapter, we explore the different requirements for designing and implementing a collaborative decision support systems.

INTRODUCTION

Mobile multimedia has become an essential part in our daily life and accompanies many work processes (Gruhn & Koehler 2004, Pinelle, Dyck, & Gutwin, 2003b). Mobile technologies are now indispensable for communication and personal information management. Their combination with wireless communication networks allows the usage in various business relevant activities (such as group decisions). This chapter investigates in the potential of mobile multi-media for group decisions. It builds upon the characteristics of group decision support with respect to mobile decision participants. Mobility analysis of group decision processes leads to the development of appropriate mobile group decision support tools. Research in-group decision support mainly focuses on the support of communication processes in-group decision scenarios. Research in mobile computing concentrates on technological achievements, on mobile networking and ubiquitous penetration of everyday processes with mobile technolo-

gies. This chapter concentrates on the facilities of mobile multimedia for group decision processes based on structured process analysis of group decisions with respect to mobile decision participants. The following section defines the theoretical foundation of group decisions in order to agree on an exemplary group decision process. Following this, a taxonomy for the complexity of group decision is presented as the foundation for requirements of mobile group decision support systems. The chapter closes by outlining the implications for the design of mobile group decision support systems.

GROUP DECISION THEORY

The ongoing research in this field focuses on group decisions as communication processes, in which a set of more than two people need to reach a mutual result, need to answer a question or to solve a problem. A group decision occurs as the result of interpersonal communication (the exchange of information) among a group's members, and aims at detecting and structuring a problem, generating alternative solutions to the problem, and evaluating these solutions (DeSanctis & Gallupe, 1987).

The aim of decision support tools is the minimization of decision effort with satisfactional decision quality. Following Janis and Mann (1979), decision makers, within their information process capabilities, canvas a wide range of alternative courses of action. Surveying the full range of objectives to be fulfilled and the values implicated by the choice, they carefully weigh the costs and risks of consequences. Decision makers undertake an intense search for new information or for expert judgment that is relevant to further evaluation of the alternatives. Furthermore, a decision maker needs to be aware of decision constraints (money, time, norms, etc.), must respect actors and their needs affected by the course of action, and lastly has to document decision for further post decision process evaluation and argumentation.

Vigilant information processing and a high degree of selectivity ought to save the decision maker from unproductive confusion, unnecessary delays, and waste of resources in a fruitless quest for an elusive, faultless alternative.

Nowadays technology can assist decision makers not only in selective information retrieval and algorithmic methodology in the judgment of alternatives. They can also direct the decision makers in a process-oriented walkthrough of decisions to avoid post-decisional regret.

PROCESS-ORIENTED VIEW ON DECISIONS

In order to support human actions as efficiently as possible with information technology, a formal process needs to be identified. Examples of decision process-models are given by Simon (1960) and Dix (1994).

According the decision process model of Herbert A. Simon (1960), the group decision process consists of the following phases and sub processes that are interdependent (illustrated in Figure 1):

- **Pre-decision phase:** Selection of the decision topic/domain, Forming of the group (introduction of the decision participants)
- **Intelligence phase:** Collection of information regarding the problem (in-/outside the group), Collection of alternatives
- **Design phase:** Organization of information, Declaration of each participant's position regarding the decision topic, Discussion of the topic and various alternatives based on existing information, Col-

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