Chapter IV
Engineering Mobile Group Decision Support

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ABSTRACT

This chapter is about mobile multimedia and its usage in group decisions. With respect to the complexity of mobile decision scenarios, this paper presents the foundation for engineering mobile group decision support systems. Mobile multimedia allows the adaptation of information technology to the increasing mobile work practice with location independent access to information resource. This spatial and temporal flexibility strongly affects group behaviour in decision scenarios. As a prerequisite for identifying the potential of mobile technology a set of indicators is identified. Using these indicators an exemplary decision process is presented and evaluated according potential for mobile support and mobile needs. Analysing the scenario leads to particular implementation requirements on interaction, spatial distribution, and temporal distribution to be respected in mobile group decision support systems.

INTRODUCTION

Mobile multimedia accompanies our daily work process in a ubiquitous way (Gruhn & Koehler, 2004; Pinelle et al., 2003a). Mobile technologies are 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 the potential of mobile multimedia for group decision. 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 techno-

logical achievements on mobile networking and ubiquitous penetration of everyday processes with mobile technologies. This chapter emphasizes the facilities of mobile multimedia for group decision processes on the base of structured process analysis of group decisions with respect to mobile decision participants. The theoretical foundation of group decisions – in order to agree on an exemplary group decision – will be defined in the upcoming section. Afterwards taxonomy for the complexity of group decision is presented as foundation for the requirements of mobile group decision support systems. This chapter closes with the implications for the design of mobile group decision support systems.

GROUP DECISION THEORY

Group decisions as communication processes focus on particular contexts in which a set of more than two people need to reach a common result in answering a question or in solving a problem. A group decision occurs as the result of interpersonal communication (the exchange of information) among the members for detecting and structuring a problem, generating alternative solutions to the problem, and evaluating the solutions (DeSanctis et al., 1987).

The target of decision support tools is the minimization of decision effort with satisfactional decision quality. Following Janis and Mann (1977), decision makers, within their information process capabilities, canvas a wide range of alternative courses of action. They survey the full range of objectives to be fulfilled and the values implicated by the choice; carefully weigh the costs and risks of consequences. Decision makers intensively search for new information or expert judgment that is relevant to further evaluation of the alternatives. Additionally a decision maker needs to be aware of decision constraints (money, time, norms…), respects actors and their needs affected by the course of action, and documents 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

To support human actions as efficient 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 (Simon, 1960), the group decision process consists of the phases and sub processes illustrated in Figure 1. The mentioned sub processes are strongly interrelated and followed in a cyclic manner.

The given decision process by Simon gives a very basic and generic view on the complex topic of decision activities, but it allows us to keep the focus on the entire problem of mobile contexts in decision scenarios without handling the underlying complexity. According the taxonomy by Dix (Dix, 1994) shown in Figure 2, these process phases can take place under various circumstances. Decisions can either be spatial or temporal distributed or both. In case of spatially distributed decision groups, the participants involved in this process benefit from the communication facilities in mobile technology (wireless wide area networks or ad hoc networks).

Considering asynchronous decision scenarios, personal direct communication between the decision participants needs to be respected as well