Chapter XLIX
Context Aware Collaborative Working Environments

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ABSTRACT

Collaborative Work Environments are software systems that allow teams, which are nowadays often distributed in location and organization to which they belong, to achieve certain projects or activities. In recent years, the available computer tools that can support such activities have grown; however, their integration is not necessarily achieved. Furthermore, users of such systems need to typically provide a large amount of setup information as the systems are not context-aware and hence cannot gather information about user activities in a simple way, and almost certainly will falter when the context of users changes. This chapter describes the inContext approach: a collection of novel techniques and a

reference architecture to support integration of tools and context information to provide collaborative work environments for the mobile worker of today. We will explore in detail how collaborative services are selected and how context is modeled, and consider the details of team forms.

EMERGING COLLABORATIVE SYSTEMS

People for a long time have conducted work in a collaborative manner; and of course, with a growing amount of service work, network connectivity, and software use, computers have started to play a greater role.

More recently, we are encountering an "always-on" ethic of many knowledge workers; that is, people want to be connected all the time, want to be able to check and receive e-mail, work as if they were in the office regardless of where they actually are, want to exchange documents in transparent ways, and so forth. Considering this view, software support for collaborative work needs to address a multitude of requirements; of course, basic collaboration functionality is essential, but this needs to be available in a context-aware manner that on the one hand provides the required transparency for a mobile workforce and on the other also supports the fact that individuals are generally part of many teams working on a multitude of projects simultaneously. These teams might span organizations, and teams might be of different forms as far as their longevity and other aspects are concerned.

Based on various criteria such as team goal, coupling, time span, and so forth, we classify emerging team forms into Nimble, Virtual, and Mobile teams (N/V/M teams). A nimble team quickly gathers to work on problems that may emerge unexpectedly. Team members can be distributed or collocated in terms of physical space. Team leadership is established in an ad hoc fashion, while peers may take up multiple roles simultaneously. Examples for nimble teams are task forces of specialists for crisis mitigation in health care (e.g., SARS) or scientists organizing a conference at a new location.

Virtual team members collaborate across geographical distance and organizational boundaries and have a somewhat stable team configuration with roles and responsibilities assigned to the team members. Exemplary virtual teams are technical consultants for a mechanical engineering project or a production team for a movie.

Members of nomadic teams are typically involved in several projects at the same time in a loosely coupled fashion.

As the name suggests, the concept and model of mobile teams aims to characterize and support team members that are highly mobile and frequently change their locations and move to different places where they may meet other collaborators. Collocation of peers, without being explicitly planned or scheduled, yields the need to opportunistically collaborate by exchanging data and artifacts in an ad hoc fashion. Experts in a political conflict resolution, musicians providing a composition of soundtracks, or actors providing stunt or dubbing services are some real-world examples.

Hence, modern collaborative working environments need to provide solutions for these issues. They should also be delivering increases in productivity; that is, they must support people in what they do and not introduce an extra burden. To that extent, they must integrate the existing tools of relevance that team members are using (be they public services or proprietary ones) and support complex forms of interactions occurring in the various team forms.

The research focus of the inContext project centers on how to exploit and combine novel techniques in the fields of context modeling and