Tailoring Infrastructures: Supporting Cooperative Work with Configurable Email Filters

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Abstract. In fragmented work settings like network organizations or virtual organizations, monolithic approaches to implement support for collaboration would require the actors involved to agree on the usage of the approach or tool under consideration. As the autonomy of actors in these settings makes this hard to achieve, we suggest an exploration and an increase in the end-user tailorability of basic software infrastructures to enable even actors in these settings to tailor their collaboration support to their needs. An example for this strategy is illustrated by using email as a basic groupware technology. We use server-based email filters to improve the coordination of work processes and increase group awareness in these settings, and focus on making it easy for end users to understand and tailor the technology according to their needs. We use and enhance concepts from the discussion on the "tailorability" of CSCW systems (a visual filter composition language, a component-based architecture and additional support for exploration and documentation) to implement and evaluate our prototype.

1 Introduction

Computer support for cooperative work has not only become a key success factor for organizations, but also the enabling technology for new forms of inter-organizational cooperation and distributed work. Virtual organizations ([21];[16]) evolved as a new form of joining core competencies of different actors (individuals and organizations) to offer products and services beyond the skill and knowledge of the individual actors.
Comparing the technologies and tools used in virtual organizations to those in traditional forms of organizations we find heterogeneity rather than homogeneity, different tools, technologies and usages rather than a uniform, standardized groupware platform. Cooperation usually takes place in a heterogeneous infrastructure with some shared standards and basic technologies, but with many different tools and usages (cf. [26],[29]). Like in other collaborative settings, there still remains the necessity to be able to flexibly configure the infrastructure that is collaboratively used according to new or changed work contexts [9]. This characteristic of “Tailorability” has up to now mostly been explored for monolithic CSCW tools or frameworks (e.g. [14], Wang and Haake 2000). But there is the opportunity as well as the need to transfer tailorability to the domain of heterogeneous software infrastructures. From a user's perspective on their collaboration infrastructure as a whole, the tailoring support should mark "Group Tailoring Hot-Spots" of the infrastructure.

As a consequence of the technological heterogeneity encountered in virtual organizations, and a lack of motivation among actors to agree on shared standards, it is often email that remains most common denominator of cooperation technology. Important groupware functionality, like awareness support of workflows or cooperation structures is then usually not available in these settings.

In our work we explore the idea of fostering group support in heterogeneous software infrastructures by using server-side email filters to implement a lightweight technological support for group collaboration in these settings. Using standard email protocols and standard web technology we try to avoid interference with the technological infrastructure of the users. Rather than providing as much groupware functionality as possible we focused on providing end-user friendly means to tailor the functionality to the given requirements of a specific collaborative setting. Here, we applied and enhanced concepts known from earlier research on tailoring and end-user development [23].

2 Related Work

2.1 Exploring Infrastructure Technology for Collaboration Support

There are various experiences to consider in the context of our work. A number of publications have recently paid more attention to the fact that support of collaborative work does not often operate on a stand alone basis, but rather is embedded in a technological infrastructure ([3], [5], [8], [4], [23]).

Dourish ([3],[5]) elaborated on the problems that the ‘layeredness’ of infrastructures, particularly the necessity to rely on lower layers of infrastructure when constructing a tool infrastructure for collaborative work, causes in the context of the development of collaborative systems. He also presented a concept of collaboration support that intertwines with the file system of an operating system instead of providing a separate tool [4]. Hanseth and Lundberg [8] addressed the role of standards in software infrastructures. On the one hand, standards are necessary to provide the compatibility among software tools, but on the other hand, standards also define structures of in- and exclusion of information and resources in collaborative