Is Group-Awareness Context-Awareness?
Converging Context-Awareness and Group Awareness Support

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ABSTRACT

This article discusses the interest of emerging a unified view for group awareness and context information on groupware and context-aware systems. Group awareness corresponds to an important concept on Groupware applications, allowing individual users to be kept aware of group’s activities and status. Context is defined by ubiquitous computing as any relevant information that can be used to characterize the situation of an entity. We assume that group awareness information should be considered as context information and handled as such. Group awareness information is often employed for decision making, contributing to users’ activities and decisions, but it gives also an important clue about user’s context, characterizing individual’s actions regarding the group. As such, group awareness may be used for adaptation purposes, adapting the system behavior, the supplied content or its services. Besides, architectural concerns adopted on context-aware system should also be considered when developing new groupware applications that are more and more designed as context-aware systems.

KEYWORDS


INTRODUCTION

Group awareness is a well-known concept from Groupware Systems. It refers to the knowledge that group members have about the group and its activities (past, present and future activities) (Dourish & Bellotti, 1992; Kirsch-Pinheiro et al., 2003). This information is commonly used for helping decision making, since it promises to group members a common ground for their own activities inside the group. Presenting this information offers an important knowledge about the current status of the group, allowing group members to better evaluate the relevance of their own activities for the group and its goals.

Group awareness support is becoming even more strategical in today working environments. Indeed, in the last decades, different phenomena and technologies have affected working habitudes. Teams are more and more independent, geographically distributed, mobile and cross-projects and

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organizations. Keeping track of the teams’ activities and status in such dynamic environment is a challenge that CSCW (Computer Support for Cooperative Work) community has dealing with these last years (Dourish & Bellotti, 1992; Schmidt, 2002; Borges et al., 2005; Decouchant et al., 2013; Gallardo et al., 2018; Schmidt, 2002). Different challenges have been considered on group awareness support, including architecture, user interface, privacy and information overload (Gutwin & Greenberg, 2002; Kirsch-Pinheiro et al., 2003; Kirsch-Pinheiro et al., 2004; Nunes et al., 2007; Blümml & Meßner, 2017; Gallardo et al. 2018; Wuertz, et al., 2018; Li et al., 2017). Teams today are interested on keeping their work activity anytime, anywhere, being supported by the technology, receiving the most appropriate information and service when needed. These needs lead to consider adaptation as an important functionality on Groupware systems.

These adaptation concerns are approaching Groupware community to another community also concerned by such pervasive environments: the ubiquitous (or pervasive) computing community. On Ubiquitous Computing, the focus is mainly on adapting system behavior to the execution context (Baldauf et al., 2007). The notion of context is actually quite similar to the notion of group awareness, being defined as any information capable of characterizing the situation of an entity (Dey, 2001). This information, that often refers to physical and execution environment (e.g. user’s location, device available memory, network connection, etc.), is traditionally applied for adaptation purposes. Context-Aware Systems (Baldauf et al., 2007; Dey, 2001) observe it in order to adapt accordingly their own behavior. They perform adaptation tasks in the behalf of the user in order to propose her/him the most appropriate service or content. Challenges considered by those systems are also multiple, including context acquisition, modelling, distribution, reasoning and quality concerns (Baldauf et al., 2007; Bellavista et al., 2013; Bettini et al., 2010; Kirsch-Pinheiro & Souveyet, 2018a), just to cite a few.

Both notions of group awareness and context information can be seen as an information capable of characterizing user’s interactions, individually or as a group member, but their treatment is not the same, since the focus for consuming it is not the same, according the community. For group awareness on CSCW community, the focus is on delivering this information to the user, while on context awareness on Ubiquitous Computing, the focus is on adapting the system behavior in a transparent way. Even on mobile Groupware Systems (Kirsch-Pinheiro et al., 2004; Wang & Reani, 2017), these notions are distinguished and handled separately: the first is delivered to the user, while the latter is used for adaptation purposes. However, group awareness information offers an important clue about user’s context, characterizing individual’s actions with regard to the group and its status. Inversely, context management architectures offer interesting lessons learned for group awareness support. For instance, such architectures prone loose coupling between application and context management tasks, freeing the application from collecting tasks, which allows considering collecting context information beyond application perimeter.

In the position paper (Kirsch-Pinheiro & Souveyet, 2018b), we advocate that group awareness information should be considered as context information and handled as such. In the present paper, we extend this initial paper, by presenting a deeper literature analysis and considering particularly architecture implications. Indeed, by considering group awareness as context information and giving it a similar treatment, we may reach a more dynamic and proactive behavior on groupware systems, favoring the development of applications that may adapt their behavior (content and services) to current usages and technologies, as well as to the group and its activities. We advocate here that a unified view can emerge from both, simplifying groupware architecture and information treatment. To illustrate this point, we discuss the use of a context distribution mechanism for distributing both group awareness and context information among group members according to their current context.

This position paper is organized as follows: we first introduce the domains CSCW and ubiquitous computing, on which basis our analysis. Then, we discuss the notion of group awareness and its treatment on Groupware systems, before introducing the notion of context and its application on context-aware applications. After, we discuss similarities and dissimilarities between both concepts,
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