

# Context-based Modeling of Group Work

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## Abstract

We show the special role that the concept of context plays in collaboration, specially on aspects of communication, interaction and knowledge sharing, reflecting on group work productivity, quality and satisfaction. In this work we address the representation and dynamics of context discussing its implications and opportunities to improving collaborative work support. (A full version of this paper is available at <http://www-sysdef.lip6.fr/~brezil/FLAIRS-05/Araujo-Brezillon.pdf>)

## Introduction

Collaboration is essential for knowledge intensive working processes. Creating an effective collaborative work environment requires more than just codifying knowledge, storing it in information systems and developing access and distribution. It is also a matter of facilitating contact, communication, mutual understanding and sharing.

The transference of knowledge among actors can only be effective if there is a common interpretive focus and context where they can understand each other and communicate. In few words, collaboration supposes the sharing of a focus and a common context for facilitating communication, and the working group behaves rather as a virtual community than as a simple social network (Brézillon, 2004).

Our study addresses the representation and dynamics of context based on previous characterization of this concept (Brézillon 1999). We examine how the context dimensions and the knowledge movement among them takes place in a collaborative interaction. We make considerations on the relevance of turning context and its dynamics explicit in a collaborative interaction and what are the implications of doing this to improve collaboration. We conclude on the possibilities of integrating context into collaborative support applications.

## Context

Each person uses a large amount of knowledge, different from one person to another, to picture a situation. We can define it as **contextual knowledge (CK)**. The contextual knowledge is dependent on the situation (date, location,

participants' background), it is a sub-part of the overall context. Thus, the rest of the context, which is not relevant for a given situation, is called **external knowledge (EK)**.

When an unpredicted event occurs, the attention of the actor is focused and a part of the contextual knowledge will be proceduralized. The **proceduralized context (PC)** is a part of the contextual knowledge that is invoked, assembled, structured and situated according to a given focus. A proceduralized context is built from a sub set of contextual knowledge that is collected, organized, assembled and structured according to the current **focus**.

Imagine a business analyst – James – that received an e-mail from the senior manager asking him to treat a new maintenance request made by one of their clients – Telcoo. While reading the e-mail – the current task and focus at hand – James used part of his contextual knowledge to notice that it was something important and that he should take care of it rapidly. He knew that because the message was sent by his superior and, as he wished to make a good career in Sw&Sw, this kind of behavior was important.

The proceduralized context built by James may also evolve to integrate some knowledge that, up to this moment, has neither been proceduralized nor is contextual (i.e. external knowledge). As a novice professional at Sw&Sw, James was not aware of the importance or relevance of Telcoo as one of the Sw&Sw's most important clients. By searching the organization documents, files, archives or intranet, or even asking another colleague, James could find enough information instructing him that Telcoo is an important client and, so, the request should have more priority among others. Figure 1 illustrates this dynamic.

## Sharing Context

Two persons having the same focus will build two different PCs if they work independently. First, because they have two different bodies of contextual knowledge. Second, because they also have different interpretations of the focus according to their different body of contextual knowledge.

One of the main characteristics of a collaborative work is the fact that all the members of the team should have a same focus that depends on the team focus. Following our

previous scenario, James noticed that the message he received was sent to two other business analysts: Robert and Lucy. He knew Lucy from other development project where they worked together (social information that stayed tacit on James and Lucy's knowledge. It was a proceduralized context built by another virtual community previously at that time and became a chunk of contextual knowledge after). Due to this proximity, he called her on the phone and shared her knowledge about the situation at hand: although it was an important request, she did not also know too much about it; she was in charge with another system deployment; she suggested scheduling a meeting with the senior manager on the next day.

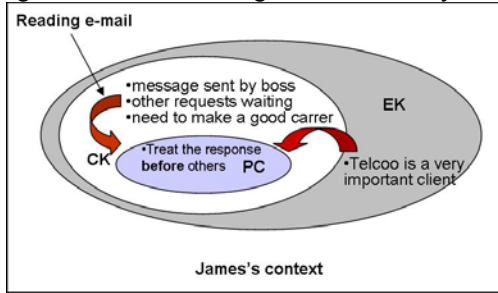


Figure 1. Representation of context dynamic

By talking to Robert, James obtained new information: when the project finished, many system requirements have not been included on the final version due to the required deadline for turning it operational. Users still lack a list of information reports that were not included in the current version.

The team has assumed a context for the task to be performed while trying to make a sense by their own and contextualize themselves on what they were supposed to do. Through interactions, they have almost the same contextual knowledge about the task. The proceduralized context shown in Figure 2 contains all the pieces of knowledge that have been discussed and accepted (at least made compatible) by all the agents. These pieces of proceduralized context then become part of the shared contextual knowledge of each agent, even if they do not remain within the focus of the proceduralized context.

### Conclusion

The **communication** process both influences as is influenced by the underlying context. Effective communication leads to an improved **understanding** (context-based understanding) among participants, of the overall group, and of the task at hand. A shared context allows a simultaneous compatible view of global and local information to make coherent the information and the corresponding action to make (Grimshaw, Mott and Roberts 1997).

The more able to understand a given situation, the more **effective** a group can be in coordinating their tasks. If the

contextual knowledge acts as a filter that defines, at a given time, what knowledge pieces must be taken into account from those that are not necessary or already shared, group actors are provided with a more effective set of knowledge at each moment, turning out to increase their **productivity**.

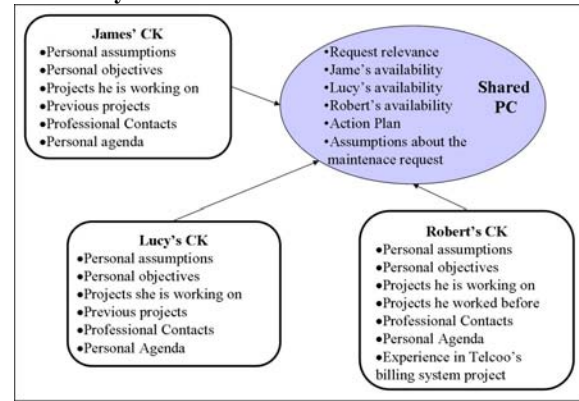


Figure 2. Shared context between James, Lucy and Robert

Developing a strong shared context reinforces the **ties** among the members of the work team (Kimball and Rheingold 2000). Developing ties through sharing contexts is also a way to reinforce **trust** among members.

A group context must be developed as a shared context for maintaining its **cohesiveness**. The shared social space provides a sense of the whole that enables members of a widely distributed group to see themselves in context. Additionally, they reinforce the **cohesiveness** of their current virtual community.

Turning context explicit and helping group members to visualize the ties, cohesiveness and interaction outcomes, can help workers to feel **committed** with the work and to discover possibilities for improvements, and the benefits of working collaboratively (Araujo and Borges 2001).

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