

Managing the Adoption of Personal Information in Co-located Work Groups

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ABSTRACT

In this position paper we present our work on group knowledge artifacts [8] and discuss how these are constructed from personal knowledge introduced to a group by its various members. It is our belief that a better understanding of the process whereby personal information is adopted by a group and then negotiated into shared group knowledge could be used to better inform the design of support systems for co-located work groups. We explain why we think that supporting this process is an important step towards improving group effectiveness and a particular challenge for co-located work groups.

Author Keywords

Work groups, group effectiveness, group information management, knowledge artifacts, co-located meetings.

ACM Classification Keywords

H5.3. Group and Organization Interfaces: Theory and Models.

INTRODUCTION

In this position paper we present our work on group knowledge artifacts [8] and discuss how these are constructed from personal knowledge introduced to a group by its various members. It is our belief that a better understanding of the process whereby personal information is adopted by a group and then negotiated into shared group knowledge could be used to better inform the design of support systems for co-located work groups. We explain why we think that supporting this process is an important step towards improving group effectiveness and a particular

challenge for co-located work groups.

GROUP EFFECTIVENESS

It is always difficult to answer the question ‘what is an effective group?’ or more immediately ‘is this group being effective?’. In academic literature many measures have been proposed that depend on whether the focus for success is the immediate task in hand, the ongoing success of a group or the development of individuals within the group.

We believe that group effectiveness should be a broader metric than an immediate measure of group performance [7], although providing an environment that enables the level of performance required is also very important. Group effectiveness should also include measurements of the group’s cohesiveness and whether completing a task together has increased the member’s ability and desire to collaborate again in the future [3].

In order to support groups so that they can be effective in this broader sense, the flow of information between individuals and groups needs to be better understood and supported. To work towards this goal, we are researching how considering knowledge as artifacts can help inform the way that information moves from being the property of the individual, to their group and then back to the individual. We are also observing how the negotiation process that changes an individual’s knowledge into group knowledge also changes the knowledge itself.

Sarmiento and Stahl [9] demonstrated that collective creative work comprises a synergy between immediate and long-term interactions. Shaping knowledge from information in a group setting is a fundamentally creative process, and so understanding how group information management supports long-term group effectiveness is important if useful design options are going to be identified.

KNOWLEDGE ARTIFACTS

Usually, when we talk about artifacts, we are referring to tangible, physically present items that have a clear boundary and also a clear purpose. For example, something

like a mobile telephone or a chair could be described as an artifact.

Stahl [10] extended this concept by suggesting that knowledge could be a type of artifact that is used in group work. When we consider knowledge in this way, it is clear that many activities that groups undertake with physical artifacts are also performed in identical or very similar ways when working with information.

One key similarity is the ownership of knowledge artifacts. We use the term 'ownership' to describe who has the right to decide how an artifact is used and there is a clear distinction between knowledge that is owned by an individual within a group and knowledge that is perceived to be property of the group as a whole.

Defining the boundary of knowledge artifacts is more difficult than for artifacts with a physical presence. The type of knowledge artifact that is useful for a problem solving co-located group is the type that has information relevant to the group and a purpose for which its members all have a shared understanding. The purpose for the information gives a boundary to the information that is within a single knowledge artifact.

GROUP ARTIFACT ADOPTION

All group artifacts begin as individually-owned artifacts that are sponsored and negotiated into the group, or rejected by them. This negotiation process has also been extended to include knowledge and information [11].

One of the main difficulties in adopting information into the group as shared knowledge is for the knowledge to exist as a group-level artifact and for all group members be sure that they understand the shared knowledge in the same way.

In a study of problem solving co-located groups [8], we observed that activity-focused interactions were used to push the group between a number of distinct states that allowed them to break down complex, unstructured tasks into something more manageable. From this, we developed a Taskwork Support Model that was intended to improve awareness both within groups, and for designers, so that a group's capability to break down complex tasks could be improved.

We identified that the key component of supporting activity focused interaction was to support effective group artifact adoption, especially group knowledge artifacts, as turning shared information into agreed shared knowledge provides a problem-solving group with most of the tools it requires to break down and complete complex tasks.

The groups observed used the process of breaking down the task to develop new knowledge artifacts and then used the knowledge artifacts to continue breaking the task down. This low-level use of the task-artifact cycle [1] is supported by repeated negotiation processes that shape what becomes group knowledge from an aggregation of individual perspectives.

The study comprised weekly co-located meetings for each group's members to coordinate the work they had undertaken individually through the previous week and to identify and schedule further activities for the coming week. This meant in practice that group members collected information individually and then decided from this which information they wanted to present to the group and how they were going to present it. As such, the personal information had already been transformed into personal knowledge – ie, a particular interpretation and application of the information – by the time it was presented to the group.

As shown in figure 1, when the group members convened for their weekly meeting, they identified which personal information they would present to the group as knowledge artifacts. They packaged their personal information with boundaries and a purpose relating to the task, then acted as sponsor for this knowledge by presenting it to their group.

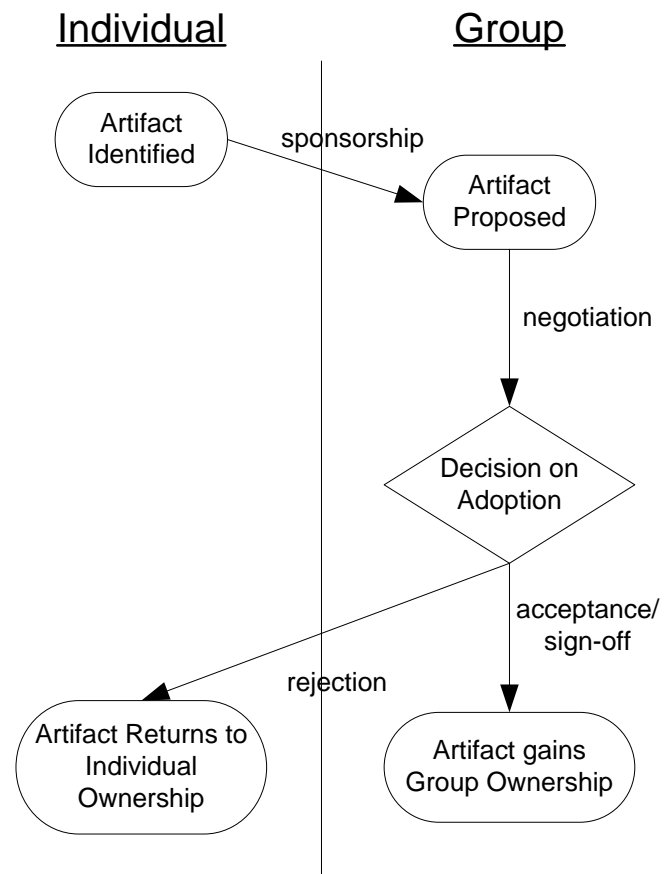


Figure 1. The negotiation process for group artifact adoption, showing the interchange between individual and group [8].

The negotiation process that the group undertakes as its members decide whether to accept the knowledge artifact into the group's domain is also a process that changes the artifact itself.

At this point, the group breaks up the individual's knowledge artifact back into its separate components of information and purpose, each of which has to be negotiated to raise it to a level of shared understanding that represents a group knowledge artifact. The need for negotiation when group members are trying to collaborate can also stem from the diverse backgrounds and perspectives of the individuals involved, as well as the task to hand [6], so these gaps need to be bridged too.

The negotiation process then requires the group to identify the common ground [2] that gives a boundary and a task-related purpose for the group information, which in turn allows them to construct a group knowledge artifact that holds a shared understanding for all the group's members.

If the group members are unable to establish this common ground through negotiation, then they are effectively saying that the group information that they have discussed cannot be packaged in a way that gives them knowledge relevant to their shared task. If this is the case, then the information returns to the individual ownership of the group member that introduced it, for them to reconsider its purpose.

CHALLENGES

A common feature of groupware support systems (GSS) is that they allow the group members to vote on major decisions; for this, they record the information required to make the decision and then they record the decision itself.

It is much more difficult for GSS to support the group adoption of personal knowledge in a structured and formalized way, because the negotiation and voting processes occur very quickly and at such a low level that many possible interventions with technology would introduce an unacceptable overhead for group members to record these outcomes.

This is particularly problematic for co-located groups, because distributed groups often communicate with media that can be easily used to capture the communication and structure it as a GSS knowledge resource. Co-located groups often have far less formal methods of communication, which makes it difficult to capture and adds a new and particular overhead to the group work.

One promising line of investigation for how to support these low-level interactions in co-located groups comes from Malone et al.'s [5] idea of *radical tailorability*, where users are able to modify the reasoning processes of their support systems, as well as the data contained in them. Using this idea, we intend to look at designing support systems where the users can train the level of recording to an appropriate level for the purposes of their group and task, so that the captured group information does not affect the speed at which the group members can interact with each other.

The measure for success of such a system would be one that maintains the balance that a collaborating group needs between servicing its taskwork needs and its teamwork needs [4], whilst recording and structuring more group knowledge to improve the group's effectiveness with respect to its task.

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