Supporting Co-located SCRUM Processes in Global Software Development

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Interest and Experiences
The software development paradigm is changing with the rise of geographically distributed, global software development (GSD). Increasingly, organizations shift all or part of their software development offshore [1]. Several studies show that compared to co-located projects, GSD projects are more likely to be unsuccessful due to geographical, temporal, and cultural distances, which hampers close collaboration [7].

As part of the NexGSD project\(^1\), we aim at providing knowledge and tools for organizations to excel in software development on a global scale. In particular, we ask how collaborative technologies can help distributed teams to collaborate in a global software development process while maintaining an agile approach [3].

In this design process – and of particular relevance to this workshop – we build on our long-term research into the design of multi-device co-located groupware systems based on the activity-based computing (ABC) paradigm [2, 6]. Specifically, we are designing the ‘Distributed SCRUM Board’ (dBoard), which is an interactive scrum board supporting both co-located and remote scrum processes like stand-up meetings.

\(^1\)http://nexgsd.org
Open Research Issues
Software engineering methodologies which are effective in supporting practitioners in co-located settings, like agile and lean, have been applied to distributed arrangements without carefully considering the implications on the very same practices that made these methods successful. Often overlooked, these mismatches are capable of hindering cooperation and eventually can pose serious threats to the fulfillment of projects.

During the past years, we have studied scrum teams in companies with different levels of scrum adoption [4]. We have observed both experienced scrum practitioners comfortably performing distributed stand-up meetings in dedicated rooms detached from the office in which the development team would spend most of its time, as well as more novice scrum adopters struggling while trying to fit, within distributed realities, practices that were originally intended for co-located teams.

Particularly relevant for this workshop are observations done at the Danish software engineering company ‘Gamma’. Gamma cooperates closely with two geographically distant partners: one located in Germany with which they cooperatively develop the software, and one located in Singapore that represents the client interests. Gamma has recently decided to embark into a complete process change that is rapidly bringing them from a plan-driven software development approach to scrum. Gamma is currently in a transient state of such process in which the effects of such managerial decision are emerging. The change has been welcomed by its two partners; however, insofar, it has been embraced fully only by the Gamma development team.

Among other scrum practices, Gamma opted to adopt also the use of a scrum board to keep track of the project status and coordinate activities within the team. The scrum board is a physical artifact located within the development team office and is used to provide a clear overview of the status of the tickets part of the ongoing development iteration (i.e., sprint). Similar to other kanban boards, a scrum board has the following collaborative properties:
- being always on and visible to the team members, it provides an awareness mechanism;
- it is physically reconfigurable;
- it allows to quickly organize tasks; and,
- it supports work practices like the standup meetings.

Our observations at Gamma focused on standup meetings: a scrum practice during which each team member has a predefined time frame to describe to the other team members what was done yesterday, what will be done today, and what represents a blocker. When we started working with Gamma, they had recently decided to switch from the physical version of the board to a digital one. The rational behind this decision was twofold: on the one hand, they struggled with keeping the board synchronized with the virtual issue tracking system provided by the Team Foundation Server system (TFS); on the other hand, they tried to involve more the German team in the process shift by granting them the possibility of remotely monitoring and interacting with the board. A plugin available for TFS that mimics the functionalities of a scrum board was used for this implementation.

Figure 1 shows a picture from a standup meetings at Gamma in which the TFS plugin is being used to guide the meeting. As it can be seen, a special arrangement is created to support the meeting: a table in the middle of the room (always the same) is raised, the monitor on such table is turned towards a larger area of the room, and the
magnification feature of the operating system is used to allow all the participants to see the ticket being discussed.

![Figure 1: SCRUM stand-up meeting done at the Gamma company.](image)

The observations revealed that there was a clear mismatch between the level of support from the system and what was needed for a co-located meeting. However, the observations also revealed that this mismatch was not a primary concern to the practitioners. In fact, they learned to adopt and bend their practices to overcome—or rather live with—such shortcomings (e.g., visual impediments and not enough space in front of the display).

Comparing with the list of collaborative properties above, we observe that the digital scrum board used at Gamma compares to the analog one as follows:

- it does NOT provide an awareness mechanism as it is NOT always on and visible to the team members but only when needed;
- it is NOT physically reconfigurable, but it can be partially reconfigured virtually;
- it still allows to quickly organize tasks;
- it still supports work practices like the standup meetings; and, additionally,
- it is automatically and seamlessly synchronized with the issue tracking system, hence, can be accessed by the German team.

Given the limitations of this arrangement, we decided to investigate a novel technological solution, namely the ‘Distributed SCRUM Board’ – dBoard (see Figure 2). The dBoard is designed to:

- provide all affordances that the analog version of the scrum board facilitates in a co-located arrangement;
- augment the analog counterpart providing a seamless integration with the issue tracking system (like the TFS plugin); and
- provide easy access to the remote site by using video as a virtual window (or media space) that could bridge between two remote offices (i.e., in Denmark and in Germany).

**Workshop Goals**

The motivation for attending this workshop is threefold. First, we think we can contribute with a set of highly relevant real-world case (see e.g. [4, 5]). The scrum processes that we have studied at Gamma represent a sophisticated mixture of adopting technology for both co-located and remote collaboration and awareness. By working with Gamma, we have had the opportunity to observe how the tools used to support a co-located work practice intended to improve coordination and awareness
were substituted with rudimentary and not fully thought through digital substitutes to support distributed team cooperation.

Second, we offer our initial design of the dBoard as a technology for supporting co-located and remote collaboration simultaneously. The design builds on our studies of companies like Gamma and seeks to overcome the distinction between whether collaboration is taking place co-located or remote.

Third, we would like to get input on the further design of the dBoard. In particular, we are investigating how multiple devices can be integrated into the use of the dBoard. A common observation in scrum meetings is, that participant bring their own devices, and in particular laptops that contain related material (like source code, bug reports, project plans, etc.). As part of the NexGSD project we are concurrently designing support for management of such material on personal computers using a temporal metaphor [8]. However, it is (still) a completely open question what multi-device configuration of a scrum meeting should look like.

Bio
The authors are all affiliated with the PIT lab and work on the NexGSD project. Our main research interests are CSCW, HCI, and Software Engineering. We all love to design, implement, and evaluate collaboration tools for global software development projects. Jakob is the professor, Morten his PhD student, and Paolo is a post doc.

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References


