Adoption and Diffusion of Groupware In Software Engineering Projects

Sarah Drummond and Cornelia Boldyreff
Department of Computer Science
University of Durham, Durham DH1 3LE, U. K.

1. Introduction

Software engineering tasks, during both development and maintenance, typically involve teamwork using computers. Team members rarely work on isolated computers; networked computers are commonly used. An underlying assumption is that software engineering teams will work more effectively if adequately supported by network-based groupware technology and project management tools.

This research is investigating the provision of such network-based support for software engineering teams, both geographically distributed and co-located. The immediate objective is to provide network-based support, specifically groupware and distributed project management, for students working on Software Engineering Group (SEG) projects in the Department of Computer Science at Durham and to develop and trial SEG projects involving staff and students from a number of universities. The long term objectives are to develop more flexible support for group working among university students and their staff supervisors for project work and tutorials in general.

2. Distributed Group Working

In the period 1996 to 1998 we have been participating in a project with UMIST and Keele University on "Developing a Virtual Community for Student Groupwork" [1][1] This project focuses on student collaboration within geographically distributed projects with the primary objectives to give students experience of working collaboratively in geographically distributed teams using Desktop Video Conferencing(DVC), to develop staff experience of operating this type of distributed project and to produce deliverables which will enable such projects to be successfully implemented in other institutions with maximum benefit at minimum risk or cost.

We have at each site created a Collaborative Working Laboratory dedicated purely to providing a collaborative environment for the students to realise the potential of collaborative technology within higher education with same-time/different place as well as exploring the role of asynchronous communication mechanisms such as shared document storage i.e. BSCW (Basic Support for Cooperative Work) [2] and Lotus Notes.

During the adoption phase in the JTAP project, different controlled, software engineering exercises were carried out to evaluate various groupware tools' usability with respect to various software engineering task These pilot exercises involved groups of three students from each university taking part. Synchronous modes of communication were used which included: shared whiteboard, chat tool, video and audio.

2.1 Results Point the Way to Trial Usage and More Evaluation

Based on these initial short distributed exercises we are undertaking more sustained trials in the academic year 97/98 within the JTAP project and locally. Distributed projects will be undertaken over a seven week period and involve a selection of final year Computer Science students.

The local projects here at Durham, will involve diffusion of the BSCW and desktop video conferencing tools into our departments SEG projects from October to May 1998.

3. Software Engineering Groups at Durham

Software Engineering Group (SEG) projects have run successfully since 1984 within the Department of Computer Science and presents the first opportunity for the student to work as part of a group, to divide up work among several team members and make technical decisions as a group - a not uncommon real-life parallel. The SEG project typically follows the waterfall lifecycle model. Since 1996 the deliverables from the project are written in HTML and submitted via the World-Wide Web (WWW).

3.1 Creation of a Virtual Environment

Further work carried out over the summer of 1997 has enabled the introduction into the SEG work of an asynchronous tool - BSCW (Basic Support for Cooperative Work).

In the first phase of the further development of SEG, a virtual environment, SEGWorld [3] based on BSCW has been developed. SEGWorld is Web-based and essentially provides a repository for all the relevant teaching materials associated with SEG projects as well as facilities for posting notices to students, providing access to software tools relevant to student project work and private workspaces for each group's work.

3.2 Conclusions and Future Work

The immediate objective of this work is to provide network support, specifically groupware and project management, for Software Engineering Group (SEG) projects in Computer Science. The support developed so far takes the form of basic support for computer-based collaboration and co-ordination as well as associated on-line training.

Within this first phase of diffusion, we are building up resources to support software engineering education using synchronous and asynchronous modes of

communication. We have set up a second, larger dedicated collaborative working laboratory with commercial and public domain software. Web-based training guides to instruct the students in the use of both asynchronous (BSCW) and synchronous (DVC) modes of communication have been developed.

Wide scale diffusion will occur during the coming academic year as the SEG projects are undertaken by all second year Computer Science students at Durham. By its very nature, the SEG project is an exercise in collaboration among the students working in a group. Some of the newly introduced practical exercises will specifically focus on introducing the students to computer-support for collaboration based on tasks which previously were done without the benefit of such support. It remains to be seen whether or not computer support results in improved quality of student groups' work which will be assessed using the same marking scheme as in previous years.

The long-term objectives are to develop more flexible support for group working among Computer Science students and their supervisors particularly for project work and tutorials. As well as the usual academic supervisors, we intend in future to explore the possibility of students working with remotely based industrial supervisors.

References

[1]   J. 2/140, "Developing a Virtual Community for Student Groupwork," : http://cssec.co.umist.ac.uk, 1996/98.
[2]   GMD-FIT, "Basic Support for Cooperative Work (BSCW)," : http://www.gmd.de/.
[3]   C. Boldyreff, Drummond,S.A., Walker,R., "Web-Based Support for Software Engineering Group Projects," : http://www.dur.ac.uk/~dcs1sad/ecscw97/ecscw97.html Presented at ECSCW 97, Lancaster University, 1997.