The Role of Wiki Technology in Student Global Software Development: Are All Students Ready?

Olly Gotel[1], Vidya Kulkarni[2], Long Chrea Neak[3], Christelle Scharff[1]
[1] Seidenberg School of Computer Science and Information Systems,
Pace University, New York, NY, USA
{ogotel, cscharff}@pace.edu
[2] Computer Science Department, University of Delhi, New Delhi, India
vkulkarni@cs.du.ac.in
[3] Computer Science Department, Institute of Technology of Cambodia, Phnom Penh,
Cambodia
longchrea@itc.edu.kh

Abstract

Since 2005, students from Pace University have been collaborating with students from the Institute of Technology of Cambodia (ITC) and the University of Delhi in India to work on globally distributed software development projects [1, 2]. Typically, ITC undergraduates act as customers and testers, Pace undergraduates act as developers and lead contractors, University of Delhi graduates act as database subcontractors, and Pace graduate students act as quality mentors and auditors. This presentation will describe our experiences and lessons from using Wiki technology to bring these students together in spring 2007 on the development of a single integrated software system specific to ITC – a library system for the ITC Computer Science department.

Presentation Objectives

The spring 2007 project was divided into three sub-components, with students from across the three locations participating as members of global sub-teams in the development of each of these components: a *Librarian/Administrator* component, a *Guest/Student/Professor* component and an innovation component focusing on the use of future information dissemination media within the Cambodian library. Since the students needed to develop a shared system architecture and user interface for the overall project, communication and collaboration tools were to be critical to their efforts; the teams had to share their work products and synchronize their tasks to deliver a fully integrated software system by the end of the semester. This presentation will highlight how Wikis constituted the coordination backbone for this project and facilitated wider quality assurance activities, whilst also drawing attention to some surprising differences in the perceived value of using Wikis for professional software development purposes across the three locations that is perhaps deserving of further study.

A Wiki was established and maintained for each sub-component of the project. Each Wiki contained all the documents and artifacts that were produced by the sub-team, including a description of the software engineering process followed, the contact information of the global sub-team and its members, the requirements, design and testing material, and PowerPoint and video presentations of the team's work. This material was all editable by the students at the three locations. By the end of the semester, the mantra was "Update your Wiki morning, noon and evening" to ensure

timely information exchange and accurate project status information. A common first response to questions would be "Did you check the Wiki?" In addition, all the material that was associated with the integration aspects of the project was posted on a separate Wiki shared by the three sub-teams. This Wiki was used to evolve an agreed architecture for the system, approve the database design, gain feedback on user interface mockups, clarify details of the deployment environment, communicate who was in charge of developing what features of the system, and to manage the integration and system-level testing documentation. Please see *http://atlantis.seidenberg.pace.edu/wiki/gsd2007/StudentsProjects* for the various student Wikis.

Wikis as the Coordination Backbone of a Project. While the process for development and communication across the three institutions has evolved over three years, creating a collaborative tool-based environment to support student working has proven more difficult. 2007 was the first year in which Wiki training was actively provided for some of the students and where Wiki use was required (as opposed to all students being left to learn about Wikis on their own and for use to be optional). Compared to the previous years, this switch in emphasis improved the following aspects of the overall project experience:

- It permitted all the students and instructors to get up to speed on the project quickly;
- It empowered students at each location to contribute ideas;
- It increased productivity, since students found Wikis easier to maintain than web pages (which were used more extensively in previous years), in turn making updates simpler and the turn-around time required to get feedback shorter, whilst also avoiding claims of lost documents in email exchanges;
- It provided a way to share the expectations of students at the different locations as to each other's roles and responsibilities, thereby monitoring each other's progress; and
- It promoted a better understanding of the software engineering process, practices and tools that were being used in the project.

Wikis to Facilitate Quality Assurance Activities. Pace graduate students acted as mentors to ensure that the Pace undergraduate students were doing what they needed to do to assure a quality result, and they were also charged to help them perfect techniques and practices that had been introduced in the classroom. Mentors were to act as internal eyes for the project and to raise any early concerns to the instructors. The auditors were to review the artifacts delivered and the processes used to deliver them. Auditors were to act as external quality gatekeepers and to keep the mentors informed of any emergent problems. The roles of mentor and auditor were greatly facilitated by the use of Wikis since these permitted the graduates to always have an up-to-date picture of the global project at any one moment in time, and to track its progress.

Culturally-based Wiki Perceptions. Prior to the project, the US instructors visited Cambodia to meet the students and to explain their role on the project. They also introduced the students to the technologies that would be used to support the development and communication processes, including Eclipse, blogs and Wikis. Wikis were then used at the beginning of the project for social bonding activities to illustrate the working philosophy to be followed to ensure for transparency and shared

awareness. Despite prior training and early use however, the Cambodian students were reluctant to use Wikis during the development stages of the project -- they had to be reminded to check the Wikis regularly and to post their work. By contrast, while new to Wikis and in receipt of little prior training, the Indian and US students had no such problems in using Wikis as intended, although the Indian students regarded such tools to be more on the periphery than those tools actively used to support development. We observed that students from different countries have had varying levels of exposure to the latest Internet-based collaborative working tools and have had different experiences of (and scholastic emphasis placed upon) the kinds of communal working that such tools take for granted. This results in divergent perceptions as to the potential value of learning about and using such tools for professional software development practices. This observation has important implications and obviously needs more in-depth study.

References

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