Bluegrass: Embedding a Virtual World in a Collaborative Software Development Environment

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ABSTRACT
The Bluegrass project is exploring how a 3D virtual world can provide distributed software teams with the benefits of being co-located. Our prototype virtual world is embedded in a collaborative software development environment and complements that environment’s capabilities with collaborative visualizations, meeting support, and socialization tools. In this demonstration, we will show the current state of our prototype.

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Collaborative virtual environments, collaborative software development, computer-supported cooperative work.

ACM Classification Keywords
H5.3. [Information interfaces and Presentation]: Group and Organization Interfaces – Computer-supported cooperative work.

INTRODUCTION
Distributed software development teams face numerous collaboration challenges. For co-located teams, a transparent, shared, physical workspace fosters awareness and encourages ad-hoc meetings and socialization [5]. Virtual worlds can build on this metaphor by arranging people in a spatial, collaborative environment [1]. Bluegrass is a virtual world embedded within Rational Jazz Team Concert [4], a collaborative software development environment. It complements Jazz’s capabilities with facilities for visualization, meeting support, and socializing.

THE WORLD IS A VISUALIZATION
The Bluegrass landscape is shaped by social information about software teams instead of software data. As seen in Figure 1a, a developer entering the Bluegrass world appears at a place allocated for the team. A large tree with the team’s name acts as a landmark for the team’s space in the world. Around the tree are personal gazebos and meeting areas (Figure 1e). The placement of teams is automatically computed from team information available in Jazz.

Transient information in Bluegrass appears as bubbles that float and fade away. Avatars and other objects in Bluegrass automatically emit bubbles at a regular interval to indicate their presence (Figure 1c). Figure 1b shows that the dots emanating from the Work Item team area are bubbles from a gazebo (left), an RSS feed (middle), and a user (right). These bubbles can be seen from afar and highlight activity within the world.

MEETINGS INSTANTIATE IDEAS, GENERATE WORK
To complement the existing collaborative aspects of Jazz, Bluegrass focuses on synchronous meetings for bringing software teams together in the virtual world.

The Bluegrass meeting area resembles a patio. Within the meeting area, a top-down perspective (Figures 1f-h) is used and different surfaces can be projected onto the floor (e.g. a calendar). Anyone can create and manipulate objects on the floor. Figures 1f-h step through an example software team meeting. The team uses application sharing to project a list of work items and creates three related tasks for discussion (Figure 1f). The team projects a voting floor and moves tasks for triaging (Figure 1g). Then the team projects a calendar to assign tasks for certain dates (Figure 1h).

The tasks manipulated in Figures 1f-h resemble sticky notes on a whiteboard. These objects are created by chatting; the chat bubbles can be persisted and moved by clicking and dragging. These bubbles can also be annotated with different icons. (Figures 1g-h show tasks with different annotations like check marks and Xs.) A right-click menu option allows any participant to transform a sticky note into a work item that can be tracked in Jazz. The text is used to pre-populate a work item form supplied by Jazz. This helps move abstract concepts and conversation back to the software development context.

SOCIALIZATION THROUGH SOCIAL NETWORKING
By co-locating them in a shared virtual space, distributed team members can mingle and build up a sense of community. This sense can be broadened by incorporating social networking services. Bluegrass taps into Beehive, an internal corporate social networking service similar to Facebook [3], to encourage casual conversation. Bluegrass examines
Figure 1: Bluegrass – (a) virtual world inside Rational Jazz Team Concert; (b) objects and avatars can emit bubbles viewable from afar; (c) different bubbles can be emitted, (d) such as a screenshot from a social networking profile that can be persisted; (e) team meeting areas provide top-down spaces used for: (f) application sharing and persisting chat bubbles as tasks to discuss, (g) voting and marking up bubbles with annotations like checkmarks, (h) assigning calendar tasks tied back to Jazz’s work item system

...a user’s profile in Beehive, and portrays bits of profile information as bubbles. The bubbles are shown using icons that represent contacts, photos, and lists (Figure 1c). Clicking will create a persisted, moveable card with more information (Figure 1d).

Virtual worlds, being synchronous environments, are amenable to group games that can help in team-building [2]. Photos from Beehive can be transformed into jigsaw puzzles via a right-click menu allowing users to play together. Social network services complement virtual worlds by providing an asynchronous channel for communication. Within Bluegrass, users can post screenshots of their virtual world activities back to their profile page.

DISCUSSION
In this demonstration, we’ve shown how a virtual world can support social aspects of distributed software development through visualization, meeting support, and social networking service integration.

People appreciated the “fun” aspects of Bluegrass—the colorful landscape, the cartoony avatars, and the tidbits of Beehive data exposed about colleagues. A corporate customer remarked that virtual worlds like Bluegrass can “bring back the fun to software development.” While “fun” does not necessarily translate to greater productivity, it may lead to community-building for a distributed software team of strangers.

At the same time, there were plenty of suggestions for improvements to the meeting tools, the integration of Bluegrass within Jazz, and improving the deployability of the system. This has led us to rethink our approach for using virtual worlds to support collaborative work: the challenge of blending virtual worlds into a collaborative context is not about creating the highest fidelity immersive experience. Rather, we need to explore what are the minimum, essential elements of a virtual world that can make a difference in collaborative work. This is the focus of our future work.

REFERENCES