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Moving First Life into SecondLife: Real World Opportunities for Virtual Teams and Virtual World Project Management

Virtual Worlds, like SecondLife, are proliferating into "first life" – our everyday world – and are already having an impact on organizational practices involving virtual teams and virtual project management.

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Consider a world where you can: conduct training sessions and bring together experts from around the globe in a single, common environment where learning is possible; hold effective meetings in a shared space where distant resources and people can come together to communicate, laugh, and create artifacts quickly and easily; and, coordinate a project with ease and overcome cultural barriers to team effectiveness. These scenarios can be realized with virtual world (VW) technology.

A VW is an instantiation of a metaverse – a fully immersive 3-dimensional virtual space in which people interact with each other through the use of avatars and software agents. This virtual space resembles the real world, or first life, but is without its physical limitations [1]. Until recently, most people thought of VWs as social or gaming environments. However, VWs are getting attention in first life because they have capabilities for new ways of education, learning, organizational communication, and even virtual project management.

Organizations such as IBM, STA Travel, Sears and Circuit City are exploring potential uses of VWs in a business context through Linden Labs' SecondLife (SL). [2]. Table 1 provides examples of how companies are using SL.

SecondLife Projects	Examples
Meet and greet customers, host employee meetings, conduct global interaction and collaboration.	IBM
Conduct marketing and e-commerce in a virtual showroom.	Sears
Provide product information and updates.	STA Travel
Create a virtual campus and online collaborative learning.	Harvard Law School
Communicate vision and build relationships with the public and customers.	NASA, IBM
Host a virtual museum for brand recognition and e-commerce.	International Spaceflight Museum
Provide a 3D hospital with free online consultation on resources for medical conditions or issues	Health Info Island
Conduct market research and test hotel designs.	Starwood Hotels
Interview, recruit, and hire employees	Ogilvy Interactive, TMP Worldwide Advertising & Communications LLC
Training simulators and Learning Programs	MIT, IBM, Nike, EMC

Table 1. Examples of SecondLife Projects

Whenever someone hears the term "SecondLife," the immediate reaction is often that SL is just a gaming environment. In reality, SL is being taken seriously by a growing number of successful organizations and entities. Innovative companies have found ways to use this particular VW to implement new practices and ideas and to enhance existing practices in a new context. Even so, many companies are asking why they should spend time exploring these VWs. We examine this question and provide insight on how VWs and their inherent technology capabilities might be used, specifically in terms of virtual team interaction and virtual world project management.

Virtual world projects (VWPs) are projects that exist entirely within the realm of a VW, such as SL. VW project management (VWPM) is the process of managing a project through coordination, communication, and control within the bounds of a VW environment. VWs offer the potential to enhance collaboration and VWPM through the unique *technology capabilities* that these worlds provide. Using VW technology capabilities, virtual teams gain access to richer, more engaging environments to help overcome barriers to collaboration. Our goal is to highlight the technology capabilities that are unique in these new environments and provide an example of those capabilities by describing a virtual world project we conducted in SL. We also discuss opportunities and challenges for businesses interested in taking advantage of VWs.

Virtual World Technology Capabilities

What is unique about virtual worlds? VWs allow you to create a world of your choice complete with buildings and artifacts that perform specific tasks, such as playback of recordings, display of slide shows, or access to brainstorming tools. Avatars

in VWs can walk, fly, and even teleport to other areas. Avatars can interact with other avatars or they can explore the world independently.

The ability to interact with objects and people through another medium is not unique. What is unique about VWs is the vividness of the environment and the technology capabilities that provide opportunities to enhance interaction and collaboration. These environments can support virtual team collaboration in ways that are not possible with current collaboration technologies [3].

Current collaboration technologies such as web conferencing, video conferencing, and video walls strive to emulate face-to-face communication, but they have yet to achieve that goal. For example, video conferencing provides communication through what is negatively referred to as "talking heads." Video walls such as HP's Halo provide more life-size images and depth perception, but even these technologies present a physical boundary such as a wall or computer that separates individuals. Virtual worlds are unique because physical boundaries no longer exist. VWs provide 3-D life-like communication in which avatars represent people and interact within a shared virtual space. Avatars interact directly with each other and with the environment. VWs bring people together in real time to enable collaboration and allow avatars to explore simulated worlds [4].

In sum, VW technology is unique in the following ways:
- 3-D life-like conversation and interaction
- Purposeful non-verbal communication including the ability to touch
- Ability to control avatar appearance, avatar behavior, and the environment

The technology provides 3-D life-like images, which allows for interactive communication. Avatars can touch things in the environment. They can move objects, they can touch other avatars, and they can create their own in-world objects. This provides an opportunity for immediate feedback not just in communication, but also on project deliverables.

People can control the appearance of their avatar, including its hair color, style of clothing, and body type. People can also control their avatar's behavior, through verbal and non-verbal communication cues. The technology provides purposeful non-verbal communication with deliberate body language, gestures, and non-verbal expressions, including touch. In real-world communication, some nonverbal communication cues occur automatically, such as a change in facial expression, which may provide more information than the listener intended. In VWs, the ability to deliberately control cues that are near-automatic reactions in the physical world is a new concept in virtual team collaboration and interaction. For example, avatars can take deliberate actions such as smiling, clapping their hands, and jumping up and down. These capabilities provide the opportunity for people to express themselves and express feelings in a controlled way.

In addition to appearance and behavior, people can control the appearance and functions of their environment. They can implement additional tools such as voting and brainstorming tools. These features can enhance the collaboration process or help manage specific tasks on a project.

Finally, individuals can choose their preferred method of communication whether it be text in the form of individual or group notes, audio, video, facial expressions, body

language and gestures, or internet lingo (e.g., "LOL") in text chat. Thus a person has the freedom of expressing and interacting with others using one or more technological forms. This ability enhances the communication process and makes the interaction between people more interesting.

These and other technology capabilities are available in VWs through advanced scripting and graphics not found in previous forms of collaboration technologies. These capabilities result in features that present a flexible, tailored environment where it is possible to conduct meaningful, contextual, and rich communication between parties.

Table 2 shows the unique technology capabilities of VWs and their support for virtual team interaction and virtual world project management.

Technology Capabilities	Relevance to Virtual Teams and Virtual World Project Management
Various *communication* channels	Provides ability for communication in team meetings. Team members can use freedom of expression. Can eliminate geographic and cultural boundaries. Provides ability to communicate using nonverbal expression.
Representation of people and the real world.	Team members can express themselves through their appearance and can control their behavior.
Real time *interaction*	Provides an environment for real-time problem solving and discussion. Provides improved coordination and control by allowing team members to interact with each other in the VW environment.
Immediacy of artifacts	Real time immediate creation/building of figures, 3D models or images that can be left behind for others to interact with.
Supplemental *tools*	Can facilitate team interaction and provide leadership. Meetings can be recorded and viewed later. 3D brainstorming tools, voting tools, or visual problem solving where avatars "stand" on their vote (e.g., move here for yes, move here for no) Avatar training using software agents.

Table 2. VW Technology Capabilities

Moving First Life into SecondLife

Project managers have many opportunities for moving into a virtual world environment such as SL. We now show how those capabilities were used in a series of experiments that we conducted in SL with project teams recruited from SL residents. Each participant was placed into a virtual world project team consisting of four to five individuals with varying skills and backgrounds. Team members had no prior history with one another, which meant that members had to get to know each other's background and skill set. We provided each team the same set of task instructions. The task was to construct a Rube Goldberg machine that resided on an island within SL. Each team was allowed one hour to complete the task.

We created an island that contained a meeting place for project members. The island had a sandbox area, which allowed project teams to develop their machine. We also developed and made available supplemental tools for participants to use, including a brainstorming tool, a voting tool, and a meeting recording tool. Figure 1 shows one of the teams working together.

Figure 1. SL Participants Collaborating on Rube Goldberg Machine.

Using the features available within SL, we recorded the activities of each project team. Our goal was to examine how these teams interacted and collaborated to complete the project task. Interestingly, we found that those teams that interacted and collaborated using the technology completed the task in the time given. The teams that struggled and did not complete the task were those who also did not take full advantage of the virtual world's capabilities to collaborate and interact. Our experiences suggest opportunities for members of virtual project teams.

Opportunities for Virtual Project Teams

VWs can impact team dynamics in virtual projects by removing boundaries to interaction. It has been argued that the behavior of virtual teams is different than behavior in traditional face-to-face teams [5]. These behavioral differences are the result of geographic distance, temporal distance, and limited face-to-face interactions. VWs can overcome these differences by breaking boundaries in terms of geographic and cultural differences. Geographic distance is no longer an impediment because avatars come together in a shared space to interact with one another. Cultural differences between individuals are minimized using universal Internet language. In addition, people can create a generic appearance, one that is independent of racial or cultural differences.

By removing these boundaries, teams can develop trust. Developing trust in virtual teams is typically difficult because team members cannot interact directly with one another. VWs can enhance the development of trust through:

- the use and control of verbal and non-verbal communication cues;
- simultaneous use of multiple channels of communication and the mix of verbal and non-verbal cues; and
- the use of a playful environment to provide teams the ability to socialize and develop member and group well being.

In our SL projects, we observed that the teams where participants interacted with each other established trust and had successful project outcomes. We also found that appearance was important in the process. We noted that people can control avatar appearance. Participants commented on each other's appearance and some outfitted their avatar in professional attire to participate in the project.

Understanding individual roles and authority on a team are important. Roles often emerge through interaction of team members, and the leadership role is of particular interest. Leadership roles are easily expressed when team members can interact and provide immediate feedback on behavior. Leaders typically emerge through verbal and non-verbal cues, and these cues are lost in a typical computer-mediated environment. However, VW technology allows expression of these cues and more. People can control their avatars, which means they can control their placement in meetings, whether they sit or stand, where they sit, and who they sit next to. They can also control their body language and style of dress. VWs provide an environment where leaders can emerge based on their behavior and actions.

VWs provide immediacy of artifacts for instant feedback. Immediacy of artifacts is the ability of users to jointly collaborate in the real-time creation and use of artifacts such as text, images, and 3-D models. The ability to touch and interact with artifacts immediately can improve team performance. Within SL, the teams were able to immediately share their contributions. For example, the teams created a list of tasks needed to build the machine. They split up each of the tasks and when a team member completed a task, the outputs of the task were immediately visible to the rest of the team. Team members could interact with the artifact, they could see it, move it, and touch it. This interaction allowed for real-time adjustments or changes based on

feedback. Anything within SL can be come an artifact – an idea, a preference, or a decision – and become real through instantiation in 3D space.

Opportunities for Virtual World Project Management

The unique technology capabilities of VWs lead to increased flexibility in how a team behaves, which provides opportunities for VWPM. VWs provide a shared space where teams can meet and interact and where project coordination can be enhanced. Project coordination is a major element of project management, but it presents an enormous challenge in virtual projects. VWs can help minimize coordination challenges through:

- ability for immediate feedback when communicating among team members;
- ability to establish trust through multiple channels of communication;
- removal of geographical boundaries; and
- ability to view one another's artifacts as they are working on them – *immediacy of artifacts*.

In order for virtual world project management to work, there must be a clear definition of roles or a clearly defined leader. One important observation from our SL project is that those teams that did not have a clear project leader struggled with the task. Project management is more effective when a clear project leader is present - a leader who understands the project and can assign tasks accordingly based on skill and experience. The teams that did not have a defined leader struggled to understand the task and assign individual responsibilities.

Challenges

Virtual world environments are not without their challenges. The accompanying box lists some of the challenges to consider when moving first life into SL.

Challenges	
Client software/hardware	Each user must download client software that requires memory and graphics. Audio capabilities of VWs are not robust and desktop must be high-end.
Learning curve	A non-trivial effort is required to learn to operate within the environment in order to take full advantage of its capabilities.
Balancing worlds	Project managers need to recognize that virtual worlds are not a complete substitute for first life; there may still a need to meet in traditional surroundings, in the same place.
Acceptance	Getting buy-in and support for the use of the technology is essential.
Distractions	People's avatars may be tempted to explore and drift away.
Norms of behavior	People may not always show the same respect or restraint when using technology to convey their thoughts.
Uncertainty of behavior	You cannot control the behavior of other avatars.
Representation	Users may have to get used to the idea of working as their virtual *personas*.
Security	SL is a public space with limited security features

Table 3. Virtual World Challenges

Final Thoughts

VWs and their technology capabilities offer virtual teams the potential for new ways of facing the challenges of managing a global IT workforce. To appreciate the impact of VW capabilities on organizations of the future, consider a thought experiment. Imagine you are part of a highly distributed project with participating team members dispersed globally who have come together to work within a virtual world such as SL. Using the VW's technology capabilities, you can immediately contribute to the project by meeting people "face-to-face" through your avatar in a synchronous shared virtual space, you can customize avatars to engender immediate trust, jointly and instantaneously design, build and review richly textured artifacts – actually show people what you think rather than just state it, use 3D brainstorming tools for ideation and ranking ideas, and share virtual objects and documents seamlessly between the VW and other software tools. This is all possible with the capabilities available in today's virtual world technology and there is much to be explored with this engaging and vivid interaction for virtual project teams.

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