Chapter 77

Knowledge Management and Project Management in 3D: A Virtual World Extension

Steve Russell
Siemens Corporate Research, USA

ABSTRACT

Project management can be improved using modern interfaces that more naturally show work situations. Employees have deep real world knowledge that can be exploited, and a sense of common purpose among team members that can be enhanced. But, project efforts are currently guided only with structured charts and diagrams that show participants the state of their team’s work activities. These charting tools have become more colorful and visually clear over time to reduce any uncertainty regarding task assignments, interdependencies, and any important schedule delays. However, a three dimensional environment extends the range of vision dramatically. Any team member can see what is currently being developed, the status of the process, and any pertinent actions needing focus, all in persistent and prominent wall displays. Discussions among remote collaborators are facilitated, focused on common views of pressing circumstances. Knowledge retention and transfer is more robust, and is illustrated in more compelling contexts keyed to current work activities. The immediacy of three dimensional world immersion will allow even forgetful workers to see at a glance the state of their contribution as well as the completion progress of those upon whom they depend.

INTRODUCTION

In this chapter, virtual worlds (VWs) are taken seriously as core elements in future work activities. Already useful in simulating and visualizing factories, in conducting meetings remotely, in practicing maneuvers in military and space missions, and in delivering enriched training, VWs are mature enough now to be employed in planning and managing ongoing task activities among coordinated teams of contributors. The focus here is on an innovative implementation of Project Management (PM) in such an environment, and the issues involved in general adoption. The ideas,
tools, and teamwork have already been moved in part into this domain, and there have been findings and lessons that are valuable as further VW project aids are institutionalized.

From a Knowledge Management (KM) perspective, there are also many exciting discoveries and powerful tools which are advancing our understanding of human know-how and shared expertise. Conceptualizations of work environments are already augmented and directed by computer applications and the electronically extended perceptions of reality that this involves. It is no stretch to say that workers and companies are becoming more and more thoroughly cybernetic – with crucial software and digital network components. Lessons gleaned slowly over decades of software experience are now solidified into digital rule-bases and best practice guides. Recent social networking platforms further bind those with similar needs and interests, using high-traffic electronic roadways for discussion, interpersonal query, and morale building. Knowledge has grown over the past sixty or seventy years along with the computer itself, and with the network of links that give light-speed connectivity to vast amounts of information. The breadth and fluidity of this knowledge-base sharing fundamentally changes the thought patterns of human contributors. The social nature of work, with collaborative outsourcing and readily available utilities, deeply alters the roles and duties of previously “individual” contributors. Group knowledge and the emergent intelligence of swarms of collaborators have become impossible to ignore for enterprises. So it is with the even deeper changes been promoted by Virtual Worlds.

Knowledge in a Virtual World has many facets. A worker immediately perceives the location setting, the current task situation, other actors, and potential courses of productive action. Just as in the real world (RW), the time and space dynamics are natural and intuitive and inherently social. This is a key point, so it is worth spending a moment on the differences between the VW capabilities and current methods of understanding and managing work. A list of areas is offered in the following, where immersive, dynamic, and collective presence in a VW enriches and fundamentally extends the power of a worker and the overall workforce.

**Project Management (PM) in a VW: Feasibility and Requirements Definition**

The starting point of a project is the determination of a need or a desired change. Those responsible for building the project plan have to see the future state that is desired – its benefits as opposed to the current state and the path of changes that lead to it. There must be a company vision as well, where the money and time investments are justified in the context of competition, markets, and other enterprise needs. A conceptual vision is elucidated, and the costs and budgeting are financially checked. Affected stakeholders are carefully identified so as to ensure common purpose. While this step can be less formal than later PM steps, it is crucial to “cover the bases” in preparation for a successful project outcome. Enterprises have executed many projects concurrently, so aligning the resources and personnel among them over time is also important. The overall charter, steps, general deliverables, and timelines are discussed.

What can a computer product offer in this initiation stage? As opposed to trying to write out steps and dependencies by hand, a computerized tool gives formal layouts and steps for activities like scheduling, budget management, team communication and documentation. Rather than pasting charts along walls, the formal documentation is managed through a dedicated service. The development is stepped out, and there are sometimes narratives stored which briefly explain assumptions and objectives.

A Virtual World environment adds a deeper clarity regarding the succession of states in the development, and the final state of affairs. A rough drawing or artist’s conception is extended