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SECOND LIFE AND OTHER VIRTUAL WORLDS: A ROADMAP FOR RESEARCH

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Abstract

Virtual worlds like Second Life are becoming important tools for, among other activities, socialization, social networking, entertainment, collaboration, and business development. These environments offer information systems researchers a unique opportunity to study how these environments are built and managed by operators, how they are used and misused by users, and the impact that they have on users, communities, organizations, and societies at large. This panel is designed to introduce the information systems community to this topic. We have assembled both academic and practitioners involved in building, managing, and using virtual worlds to discuss a roadmap for research on virtual worlds.

Keywords: Virtual Worlds, Synthetic Worlds, Online Games, Virtual Reality, Human Computer Interaction, Second Life, World of Warcraft, Research Frameworks.

Introduction

The term *Virtual Worlds* describes online immersive "game-like" environments where participants engage in socialization, entertainment, education, and commerce. As a genre, these environments are classified as massively multiplayer online (i.e., MMO) virtual environments.

MMOs have grown dramatically in popularity. As of January, 2007, World of Warcraft, was supporting more than 8.5 million members. While game-focused MMOs rely on fantasy and role playing (e.g., World of Warcraft, EverQuest, Final Fantasy, Dungeons and Dragons), others (Massively Multiplayer Online Social Games, or MMOSGs) have been designed to enable socialization through the building of shared interest communities. What is unique about these MMOs is that they are designed to function as realistic trading areas for exchange of virtual objects created and maintained exclusively within the virtual environment. Most support commercial activity, such as the buying and selling of "virtual" property. For example, Linden Labs designed Second Life to enable members to build their own environments, generate social networks, and engage in a virtual economy using a synthetic but convertable currency "Linden Dollars." Members can create objects, then sell them. Examples of current economic activities include: buying and selling (or renting) land, building stores then leasing them, as well as a range of "work for hire" services such as architecture, scripting, and advertising.

Of particular interest, however, is the rapid move by leading "brick and morter" companies such as Sears, Circuit City, Reuters financial services, IBM, and others to set up shop within Second Life for the purpose of inter-linking the "in-world" virtual economy with the "real-world" economy. For example, a member can "shop" for products in the Circuit City virtual store: when a product is chosen, the member is taken to the "real" e-commerce site for the actual purchase. Thus there is both a "virtual" and a "real" economy emerging, and a complex of research issues that explain how they link together.

Virtual worlds also offer opportunities for education and training. Harvard Law's Berkman center has built a large collaborative environment in Second Life, and holds regular seminars there. IBM, Reuters and others have built large facilities designed to host scientific and business meetings involving hundreds of avatars. ISWorld has an island. Training applications are enabling medical students to "go inside" a beating "virtual" heart, and first-responders to react to a "virtual terrorist" attack.

The Research Challenge

Although viewed by many as being little more than inter-linked video games, virtual worlds have emerged as a rich and complex platform for research. Virtual worlds may be viewed as vast laboratories for examining a host of social science research problems. Castronova (2006, p.1) suggests that large multiplayer games are “social science research tools on the scale of the supercolliders used by physicists.” They offer researchers a "laboratory" where people behave in ways that often are nearly identical to how they behave in the real world while.

For research purposes, these environments can be built, managed, operated, and controlled in a way unlike any other social science research environment. For example, the emergence of a "dual economy" based on synthetic "Linden Dollars", but with real-world currency convertability is being studied, not only by academics, but also by government authorities worried about online gambling, cyber-porn, money laundering and tax evasion. As an example, a large pharmaceutical company is experimenting with an interface that takes a pre-existing database of organic molecules and then "builds" them in the virtual world so that researchers can "walk around inside the molecule and discuss its structure." A number of researchers in law, public policy, and economics have published on questions addressing regulation and governance of virtual worlds, and the emerging virtual economy (Castronova 2006; MacInnes 2006; Malaby 2006). Legal scholars have published on the relationship between "real world" and "virtual world" problems. There are emerging crime issues in virtual worlds, problems with enforcement of contracts, problems with protection of intellectual property, and a host of issues that revolve around the use of "synthetic money" for providing real services. For example, Lastowka and Hunter (2004-2005) address the issue of whether virtual properties that are bought and sold in virtual worlds should be considered property in the legal sense. Similarly, Lastowka and Hunter (2004) provide a "normative" account of virtual property while Roche and Van Nostrand (2007) examine the issue of identity theft and torts in virtual worlds. More research is needed to understand how existing local and game-wide economies operate, how rules and codes of behavior develop, and how the activities of participants in these games translate to real-world consequences.

Finally, as an information system, virtual worlds present researchers in information systems, computer science, and information science with numerous opportunities to observe, build, and refine insights into the underlying infrastructure involving distributed computing, scripting, new systems development and project management methodologies, and the creation of middle-ware that links "virtual world" and "real world" enterprise applications.

Panel Purpose and Format

The intent of this panel is to stimulate research and theory development in the context of virtual worlds. Given that individuals and businesses, both small and large, use these environments to advertise, buy & sell products, collaborate & share information, build social networks, and engage in interactions that mimic interactions in real life, they provide a new avenue of research for IT scholars. We have assembled a panel that will discuss a few of the most compelling research issues presented by virtual worlds. Specifically, the panel will include the following topics and content.

- Introduction to the Panel and Overview of Virtual Worlds (*Mennecke*)
- Video Demonstration of Second Life
- Overview of the Research Roadmap (*Roche)*
- Technology, Infrastructure, and Governance Research (*Konsynski and Bray*)
- Architectures of Virtual Worlds & Inter-Linking with Business Systems (*Lester*)
- Business Strategy Challenges & Emerging Applications (*Rowe*)
- Audience Questions and Discussion (*Townsend*)

Our hope is that this panel represents a useful starting point for dialog and action towards the goal of establishing a fruitful and robust research agenda for virtual worlds.

Note on the Research Roadmap:

The panel includes a report on the findings of a study group assembled in June 2007 at the Columbia Institute for Tele-Information and The Conference Board. The purpose of the study group was to examine the emerging research agenda for virtual worlds from 2007-2015. Using Google collaborative documents and a wiki, the group of 53 researchers, representing 35 institutions first identified then examined a wide-ranging set of research issues divided into seven groups: (1) technology challenges, (2) business strategy challenges, (3) political and governance issues, (4) consumer acceptance issues, (5) cyber-crime and security issues, (6) legal issues, and (7) national security issues.

The panel includes a high-level summary of the findings of the Research Roadmap that focuses on issues of interest to the information systems community. These include (1) technology issues (scripting languages; development languages; interfaces between virtual worlds and production databases; development methodologies), the issues surrounding (2) business strategy (emerging business applications [customer service, bioinformatics modeling of organic compounds, brand building, consumer testing], the entry decision), and (3) legal and crime issues (intellectual property issues, money laundering, pornography, gambling, fraud, contract formation, jurisdiction issues).

Conclusion

Virtual worlds such as Second Life offer scholars an interesting set of opportunities for examining social interaction, technology development, adoption, and diffusion, business development and operations, and a vast array of other topics of interest to researchers interested in information systems and, for that matter, other branches of social science. This panel brings together a group of scholars and practitioners who will address several of the important issues that virtual worlds raise and summarize a research roadmap that was generated by a group of researchers during the summer of 2007. The panel offers participants the opportunity to learn about virtual worlds, to understand the issues that these environments create for users, organizations, governments, and society, and to discuss opportunities and ideas for future research that can be undertaken to better design, build, manage, and use this new technological universe.

Panelist Bios

Brian E. Mennecke (AKA – Gut Noel) is an Associate Professor of Information Systems at Iowa State University. Dr. Mennecke has been involved in online gaming since the early days of first-person-shooters and has been focused on Second Life since late 2006. He has a PhD in Information Systems from Indiana University and has researched topics related to team and group collaboration in virtual environments, spatial relationships in 3-D worlds, taxation issues in online games, and marketing applications in Second Life. He has also been active in research in RL in automated ID systems (e.g., RFID), food security, and the role of technology in collaboration and training.

Edward M. Roche (AKA – Edo Cleanslate) is the manager of The Conference Board's Council of Telecommunications and is an affiliate researcher at the Columbia Institute for Tele-Information at Columbia Business School. He received an M.A. in International Relations from Johns Hopkins School of Advanced International Studies in Washington, D.C., and an M.Phil. and Doctorate from Columbia University in New York City. He will complete a J.D. in June 2008 and take the California Bar. Ed is the author of several books and papers including Information Systems, Computer Crime and Criminal Justice, and Calculating the Cost of Computer Crime, Miss. L. Rev. Ed's previous work includes serving as Chief Research Officer for the Gartner Group, and Chief Scientist for Concours Group. Ed is the editor of the Wiki on Virtual Worlds http://barracloughltd.com/mediawiki/ and is the Guest Editor for the special issue on virtual worlds in the journal Database.

David A. Bray (AKA - Secure Courier) is currently a PhD candidate researching Information Systems at the Goizueta Business School, Emory University. Prior to academia, David served for 5 years as IT Chief for the Bioterrorism Preparedness and Response Program at the Centers for Disease Control and Prevention (CDC). Prior to CDC, David worked as a senior developer and project manager for Microsoft, Yahoo!, the Institute for Defense Analyses, and the National Institutes of Health. His research focuses on knowledge ecosystems and emerging governance structures within virtual worlds. David is also researching the convergence between virtual worlds and knowledge ecosystems, particularly for large, inter-organizational collaboration efforts.

Benn Konsynski (AKA - Rejin Tenjin; Center for V-BIZ and V-GOV in SL) is the George S. Craft Professor of Decision & Information Analysis at the Goizueta Business School at Emory University. His research interests included electronic commerce, delegation technologies, model management, decision processes, and virtual reality and worldmaking. He is interested in a number of research topics in Second Life, including innovative models of exchange and commerce practice in VW buyer and seller communities, patterns of barter and exchange, alignment of forms of learning and practice, infrastructure and tools for learning, models of service provision for governments and welfare institutions, information and services provision for institutions like CDC, Halle International, etc., and visualization and new tools for collaboration and knowledge sharing.

Michael Rowe (AKA - Ultravox Freeman) is IBM's top expert on virtual worlds. As a member of IBM's 3D internet and Virtual Worlds team, Michael is building the strategy for IBM's growth in the 3D Internet. Michael has spent the last 3 years working in Virtual Worlds including Second Life, There.com and others, assessing how to best leverage this technology for business and collaboration. He graduated from the Grady School of Journalism with a degree in Telecommunications, focused on video Journalism and production. Michael also has an MBA from Duke University's Fuqua School of Business.

John Lester (AKA - Pathfinder Linden) is Linden Lab's Boston Operations Director, coordinating the growth of Linden Lab's Boston-based office. He is also the Academic Program Manager, acting as a general resource and evangelist for educators using Second Life for teaching, academic research, and scientific visualization. John joined Linden Labs in 2005, bringing experience in online community development as well as a background in the fields of healthcare and education. Previously he was the Information Technology Director in the Neurology Service at Massachusetts General Hospital, where he pioneered the use of the web in 1993 to create online communities for supporting patients dealing with neurological disorders. He has also held an academic appointment at Harvard Medical School, where he created online collaborative environments for professors and students to advance the case-based teaching method in medical education

Anthony M. Townsend (AKA – TwinTheaters Janus) is an Associate Professor of Information Systems at Iowa State University. Dr. Townsend became interested in networked and online collaboration with the advent of the first Ventana products, and has continued to pursue research in collaborative environments. He has a PhD in Organizational Behavior and Industrial Relations from Virginia Tech and has conducted research in virtual collaboration and technology and team process. He is currently involved in research into technology and personality, gender and technology, and the role of cognitive style and online decision making.

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