MIS Quarterly

SPECIAL ISSUE

STEPPING INTO THE INTERNET: NEW VENTURES IN VIRTUAL WORLDS

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When the call for papers for this special issue went out in the fall of 2007, there was a lot of hype around virtual worlds, with organizations such as Toyota, American Apparel, IBM, Reuters, Sun Microsystems, and Wells Fargo experimenting with Second Life as a potential platform to reach consumers. Anshe Chung was touted as the first online personality to exceed one million U.S. dollars from profits earned inside a virtual world. However, in accordance with Gartner's hype cycle, after the initial spike in hype in 2006, virtual worlds quickly entered into the phase Gartner refers to as the "trough of disillusionment." As enticing as the initial press reports were around the potential of virtual worlds for creating new forms of value, during the disillusionment phase individuals and organizations discovered what we have long known in MIS: if you build it, they will not necessarily come.

With the publishing of this special issue in fall 2011, we are now, however, seeing the emergence of virtual worlds from the "trough of disillusionment" onto the "slope of enlightenment," entering a phase where real benefits, rather than hyped expectations, are starting to hit the mainstream with potentially transformational technologies. Far from calls that "Second Life is dead" (Livingstone 2011), revenues in 2011 from the virtual goods industry, an industry that was virtually nonexistent a few years ago, are expected to reach $7.3 billion globally, of which $2.1 billion are projected to be in the United States (Sorom 2010). According to KZero (2011), there were 1.185 billion registered users in virtual worlds in the first quarter of 2011, more than double the number of users in 2009. The largest segment of users (561 million) is between the ages of 10 and 15 (KZero 2011). In the past year, we have seen an increase in the pace of virtual world developments, such as in open source and browser based worlds—BlueMars, OpenSim, OurBricks, realXtend, and the recent launch of Kitely—all of which are reducing the threshold to entering virtual worlds and moving the industry toward the productivity plateau. Due to the fast growth of broadband Internet access and computing power, individuals and organizations in a variety of industries are stepping into the Internet and experimenting with new ways to use virtual worlds as a complementary means to the real world for communicating, collaborating, and organizing economic activity.

As virtual worlds move beyond the hype stage, organizations and users are becoming more adept at experimenting with these technologies in ways that offer practical benefits that will become more widespread. Chances are that if you talk with college students today, many cannot imagine why people would prefer to spend time in a virtual world like Second Life over Facebook. However, if you ask a 10 year old, chances are she will say that the avatar experience is far more appealing than just reading about what other people are doing on Twitter or Facebook. If you ask someone over 40 (the people who grew up in the "real world"), chances are she will not understand why young people spend so much time doing either (for more on what college students think about virtual worlds, refer to the blog posts on Nordic Virtual Worlds Network http://nordicworlds.net/2011/03/06/what-do-students-think-about-virtual-worlds-some-reflections/). Over the next 5 to 10 years, as virtual world technology moves into second and third generations and these young virtual world users age, the demographic of virtual world users will also mature, making virtual world adoption and use more widely accepted. And as the virtual gaming generation continues to enter the workforce, their demands will fundamentally change how and where socializing and work occur to the extent that we will most likely see the borders between work, play, and learning dissolve or at least be reshaped.

This suggests that the insights from the research presented in this special issue are indeed timely and relevant. All of the papers in this special issue have in common the examination of the virtual world context (i.e., 3D immersive, computer-simulated environments where users are represented by avatars through which they interact in real time with other avatars, objects, and the environment). While the technologies underlying virtual worlds will change over time, the theory-based research in this special issue, although performed in the early stages of the technology, will continue to inform research and practice in important and enduring areas, such as (1) how the rules system imposed by virtual world creators influences both virtual world and real world interactions, (2) how perspectives around the design of information systems need to adapt and change to account for the flexibility and variability in virtual world environments, (3) how users engage in sensemaking around these technologies, (4) how the person–avatar relationship is established and developed, (5) how engaging in a virtual world environment creates a more immersive user experience, and (6) how virtual world experiences impact co-creation, innovation, purchasing, and other human–avatar behaviors.

The diversity and range of issues that can be examined in virtual worlds, since they mirror, model, and extend the myriad interactions available in the physical world, make virtual worlds an interesting context for study. One of the unique contributions of this special issue is providing readers with insights about a wide range of methodologies and theoretical perspectives that can be used as the basis for future research. For instance, the methodologies in this special issue range from content analysis of end-user licensing agreements to the creation of virtual world places with engaging activities as part of field experiments and simulations. In one study based on action research, the authors created activities in Second Life where avatars were invited to cocreate solutions to "Ideation Quests," addressing problems related to product design and sustainable living. Another study combined biometrics using facial scans, body scans, and body mass index to render an avatar that shares its appearance with its real world person. Yet another study examined how a real world place (a hospital) was able to brand itself by creating a replica in a virtual world, which was then transcribed by the authors into a two-dimensional experience using screenshots and audio. This combination of virtual world and real world experiences enables researchers to examine a variety of theoretical frameworks about human and/or avatar behavior, attitudes, and intentions, using methodologies that allow for the experimental context to be created without the typical costs and constraints of real world experiments.

Before we continue with an overview of the themes and articles in this special issue, we will clarify the use of terminology in this introduction. The term *user* indicates a participant in a virtual world, regardless of the type of participation (e.g., player, actor, participant). A *person* is the user in the physical world, and an *avatar* represents the user within the virtual world. The term *creator* refers to the individual and/or organization creating the virtual world and who determines the rules and enforces the licensing agreements.

Virtual World Creation and Design

At the most fundamental level, virtual worlds are reflections of their creators. As such, the first topic explored in the special issue examines the design decisions of virtual world creators and the implications for person and avatar behaviors under different design strategies. Although we adopt the term in this special issue of virtual worlds loosely to represent any type of 3D computer-simulated environment, there is a great deal of diversity in virtual world designs, which have interesting implications on outcomes. For instance, prior research describes how virtual worlds can be mapped along two key dimensions: a fantasy–realism dimension and a progression– emergence dimension (Schultze and Rennecker 2007). The progression–emergence dimension indicates the extent to which the activities in the world are scripted and

dictated by the worlds' creators (e.g., virtual world games such as World of Warcraft) or emerge through interactions with other avatars (e.g., social virtual worlds such as Second Life). Virtual world creators must not only consider how to model their worlds along these two dimensions, but must also make significant decisions about who can create artifacts and how, who owns the intellectual property that results from the work and/or play invested in the game, and how decision making and control are balanced between the creators of the virtual world and the users who inhabit it. Once these basic decisions are made, there is still the major challenge of actually designing the information system underlying the virtual world.

In the article "The Control Over Virtual Worlds by Game Companies: Issues and Recommendations," Christophe Roquilly examines what he refers to as the "5Cs" or five key factors that creators use in the development and control of their virtual worlds. The first four Cs are related to the design of the virtual world—copyright, code, creativity and community—and are powerful, interlinked components that creators use to determine what is and what is not possible in their virtual world. For example, the more a user is restricted in terms of creativity due to the scripting of the virtual world, the more a virtual world creator must use strict computer codes authorizing users to only perform actions provided for within the script of the virtual world. The fifth C is a complementary component—contracts—that creators then use to reinforce control over users. By examining the EULAs (end user license agreements) and TOS (terms of service) of 20 different virtual worlds (free to play, box to play, and pay to play), Roquilly develops insights on how virtual world creators strive to create sustainable business models by manipulating the 5Cs to exert a certain level of control over the services put at the disposal of users. These insights reveal that virtual worlds are not just simple gaming environments but complex operations embedded within a prosperous and highly competitive global industry. For example, property rights are becoming increasingly controversial on an international scale and, paradoxically, the EULAs and TOS of the companies investigated actually presented greater legal risk for the virtual world creators than they provided security. Key recommendations are then provided about how contract provisions must be aligned to support the chosen business model to make informed decisions that benefit both users and creators.

In the second article, "Design Principles for Virtual Worlds," Alok Chaturvedi, Daniel Dolk, and Paul Drnevich apply a design science lens to examine the design, development, validation, and use of virtual worlds. The authors first develop their argument that virtual worlds are a new class of information system since they are characterized by a different dynamic governing the relationship between requirements and users. Based on a literature review, the authors identify the key characteristics associated with agent-based virtual worlds to discern their design requirements: on the one hand, deep design structures reflecting conventional modeling and simulation system architectures, and on the other hand, emergent structures capturing the unpredictable user–system dynamics inherent in emergent knowledge processes. This review leads the authors to suggest that virtual world design requirements challenge extant information system design theory. To illustrate this, the authors then develop a large-scale, complex, mirror virtual world, the Sentient World, which was based on Afghanistan districts with over 2.5 million agents representing citizens of Afghanistan. A set of deep structure and emergent structure design principles are then developed and discussed. One of the key observations is that, like any open system, over time a given set of conditions may lead to a multitude of end states (multi-finality) and many different conditions may lead to the same end state (equifinality).

Virtual Worlds as Occasions for Sensemaking

Once virtual world creators establish their 5Cs and design structures, users are invited to inhabit the world. Users are then confronted with the significant challenge of how to make sense of this new environment through their participation and interactions with other avatars, objects, and the environment. According to John "Pathfinder" Lester, a virtual world strategist previously with Second Life and now with ReactionGrid, one of the major reasons why the hype around virtual worlds did not develop into a real wave of innovation is that people were stuck in their old ways of thinking and thus replicated experiences from the real world into the virtual world (Brown 2011). For instance, avatars do not get tired so they do not need to sit, yet so many of the virtual meeting spaces mimic a real world conference room or classroom with chairs and tables. Even though virtual worlds offer the technical freedom to transcend the norms and constraints of real life, users often still perceive it to be socially unacceptable to see a naked human-like avatar running through a crowd (Schultze et al. 2008). This gives rise to the need to better understand how users make sense of virtual world environments and how they perceive the value associated with virtual world experiences.

In their paper, "Arguing the Value of Virtual Worlds: Patterns of Discursive Sensemaking of an Innovative Technology," Nicholas Berente, Sean Hansen, Jacqueline Pike,

and Patrick J. Bateman explore how individuals make sense of the potential value of virtual worlds. Using a Toulminian analysis for deconstructing practical reasoning, the authors captured, analyzed, and elicited patterns of the arguments based on the essays that 59 management professionals wrote about the value that these new technologies offer real world organizations. The rationale underpinning the study is that at this point, the organizational value of virtual worlds resides largely within the discourse, yet it is this discourse that will contribute to the shaping of the future reality of virtual worlds. Not only is this study of interest for practitioners in terms of the arguments both for and against the real world organizational use of virtual worlds, but it is also of interest from a methodological standpoint. The researchers go beyond prior work in the IS field by using Toulmin's model as a methodological device to assess patterns in practical discourse and show how this perspective can be used to capture the dynamics of sensemaking across a variety of intellectual traditions.

Person–Avatar Relationship

One of the very first occasions for sensemaking in a virtual world is trying to make sense of the relationship between the person and the avatar. Does the person view the avatar as a created object or thing, as an extension of self, or possibly as a child or offspring? In most virtual worlds, a person assumes an identity as an avatar and chooses or creates a representation of self through this avatar. Clearly, this presents interesting possibilities and questions because the avatar may resemble or differ from the identity of the person behind it. Additionally, there is a duality to avatar identity in that there is the actual form of the avatar that is either created by a person or predefined by creators and optimized for the specific role the avatar enacts (e.g., an avatar in a warrior class in a virtual world game like Everquest), and the accoutrements of the avatar, such as the avatar's clothing, adornments, and tools. Similar to the physical world, people spend considerable amounts of time and/or money on their avatar's appearance in order to create the desired identity and image they want to project to others. How one's avatar appears to oneself and to others is critically important for understanding engagement in virtual worlds since the avatar is the embodiment that enables communication and interaction with other avatars, objects, and settings in the virtual world.

In the article "What If Your Avatar Looks Like You? Dual-Congruity Perspectives for Avatar Use," the person–avatar relationship is examined to better understand how the appearance of a person's avatar impacts that person's attitudes toward the avatar and intentions to use the avatar. Kil-Soo Suh, Hongki Kim, and Eung Kyo Suh extend previous research by combining the two previously investigated perspectives of avatars: (1) the value expressive perspective in which the avatar is viewed as another self through which people express values and person characteristics, and (2) the utilitarian perspective in which the avatar is viewed as a product or tool used to conduct realistic tasks. The authors map these perspectives onto two psychological processes: self congruity and functional congruity, and develop a model to examine users' attitudes, evaluations, and behavioral intentions toward an avatar in a realistic, task-focused virtual world. To generate avatars resembling their users, the authors used various 3D and virtual reality techniques to generate both facial and body similarity. A virtual clothing store was then designed where avatars could try on and evaluate shirts and jeans. The findings suggest that the more the avatar's facial and bodily appearance resemble the user, the higher the levels of person–avatar identification, emotional attachment, and intention to use the avatar. This implies that for realistic, task-focused virtual world contexts, such as shopping, matchmaking, or exercise, avatars that mirror the user should increase the likelihood of cognitive connection and avatar use.

Engaging in a 3D Environment

One of the main assumptions cited as a key differentiator of virtual worlds over more traditional technologies is that there is something unique to the 3D environment of virtual worlds that provides a richer, more immersive experience. A key characteristic of virtual worlds is that they can be deeply engaging. According to theories of media richness, 3D environments are objectively rich because there is synchronous contact; the visual stimuli, objects, and environmental designs offer a variety of social cues; and communication occurs through multiple channels, including audio, visual, and text. How these different properties interact to create an experience that is highly engaging for users is still not well understood, especially in emergent, social virtual worlds where activities are not pre-scripted. MIS research has a rich and diverse set of findings about what makes computer-mediated communications engaging, including constructs such as telepresence, social presence, intrinsic motivations, playfulness, cognitive absorption, and flow. When a user becomes engrossed in an activity, a high level of focus and concentration has usually been achieved, and users often report that they lose track of time or have a distorted sense of time when involved in virtual world activities. However, much of the prior research has been conducted by examining 2D information systems, with a predominant focus on systems that are used to enhance workplace productivity. How do we predict and explain the acceptance, use, and usefulness of

management information systems that are designed to facilitate conversations, collaborations, and interactions that are engaging and fun? What does "deeply engaging" mean and how is it achieved in a 3D virtual world? Given the importance of these questions and the lack of prior research in the 3D context, the next three special issue articles focus on aspects of 3D immersion, how it is achieved, and the outcomes in behaviors, attitudes, and/or intentions as a result of being immersed or fully engaged in virtual world activities.

The article "Enhancing Brand Equity Through Flow and Telepresence: A Comparison of 2D and 3D Virtual Worlds" examines the fundamental question: Are 3D virtual environments more immersive than their 2D counterparts? In this research, a virtual world tour in Second Life of a real world hospital was replicated as a user-controlled slideshow to compare the effectiveness of 3D versus 2D in terms of building brand equity. Fiona Fui-Hoon Nah, Brenda Eschenbrenner, and David DeWester find that the 3D virtual environment induces higher perceptions of telepresence and enjoyment, which in turn positively impact brand equity. Surprisingly, however, the research also found that the 3D virtual world experience induces a direct, negative effect on brand equity. This suggests that while virtual worlds may provide an experience that is more immersive and engaging, having to navigate and interact in a virtual world may be too distracting to result in positive branding.

The next article, "From Space to Place: Predicting Users' Intention to Return to Virtual Worlds," examines the specific and unique properties of 3D virtual worlds that can be used to create a sense of place, resulting in deep involvement and cognitive absorption. Lakshmi Goel, Norman A. Johnson, Iris Junglas, and Blake Ives examine how a person forms place attachment in the virtual world context, where what is originally perceived of as a space is transformed into a place as a person, through his or her avatar, engages in an interactional process during which he/she relies on sensory perceptions, becomes aware of others and objects in the environment, and engages and attaches meanings to these interactions. One of the key distinctions still between virtual worlds and the real world relates to sensory perceptions since currently virtual worlds only offer sight and sound without smell, taste, and touch. In this article, the authors introduce four key attributes as characteristics of place—aura, focus, nimbus, and boundaries—which reflect the properties that enable users to describe interactions among avatars and between avatars and objects. Based on a lab experiment, the study's results indicate that the key dimensions of awareness of place (social awareness, task awareness, and location awareness) contribute to cognitive absorption, which in turn predicts the intention to return to a virtual world.

In virtual worlds such as Second Life, users are expected to actively engage in and cocreate the virtual experience. The success of Second Life and other virtual worlds rests on the creative ideas and energy of users, rather than the creators of the virtual world platform. In these user-generated virtual worlds, where users purchase or rent the "land" and build for themselves, one intriguing question is how do you get users to engage and cocreate places that will be appealing to other users? In the article "Co-Creation in Virtual Worlds: The Design of the User Experience," Thomas Kohler, Johann Fueller, Kurt Matzler, and Daniel Stieger draw upon the perspective of the different types of value that an individual can derive through the act of co-creation. Building on previous research in 2D environments, this research examines how the virtual world environment must enable different aspects of an experience, such as the pragmatic experience (information regarding what is happening and/or the purpose of the activity), the sociability experience (a sense of community among participants), the usability experience (quality of the experience), and the hedonic experience (the activity is mentally stimulating and a source of enjoyment). Through action research where the authors engaged with more than 300 avatars in a series of "Ideation Quests," the authors develop a set of design principles for creating virtual co-creation systems and then discuss a set of interesting theoretical and practical contributions. For instance, designers should pay considerable attention to the collaborative dimension of virtual worlds, both facilitating and encouraging the sense of community developed through the co-creation activity. To date, many virtual world environments suffer from usability problems, which significantly detract from the experience and an individual's motivations to cocreate with the host.

Virtual World Economies

One of the important distinguishing features of virtual worlds such as Second Life is that users, not virtual world creators, retain property rights over the goods and services they create. This establishes a new form of market economy where users can buy and sell virtual goods and exchange money from the real world into and out of the virtual world. This raises a number of interesting research and practical questions about how corporate entities can attract and retain potential customers within the virtual world environment by making use of the unique features offered with this new medium. Having an immersive experience in a virtual world has significant marketing potential, especially if it can be shown that product placements in immersive activities are more effective at generating sales and brand loyalty than static marketing channels, such as print and web-based advertisements.

However, as yet there is little understanding of how to effectively market to virtual world participants through avatar-oriented activities, or how avatars are a new form of consumer capable of making purchases of both virtual and real world products and services.

This question of how to promote virtual world sales is explored in the last article of this special issue, "An Odyssey into Virtual Worlds: Exploring the Impacts of Technological and Spatial Environments on Intention to Purchase Virtual Products," which examines intentions to purchase virtual goods. Animesh Animesh, Alain Pinsonneault, Sung-Byung Yang, and Wonseok Oh adapt the stimuli–organism–response theoretical framework to examine how the environmental stimuli of the virtual world impact an individual's experience, which renders the response of intentions to purchase. Using data gathered from 345 survey participants in Second Life, the research combines aspects of the unique features of virtual worlds in terms of the density of the population of avatars in an area and the stability of place and how these features result in an immersive experience for users. One of the interesting findings is that users react differently to environmental stimuli: users who are casual as opposed to regular virtual world participants seemed to be more agitated in highly dense environments. Casual users may be overwhelmed by the presence of many unknown avatars, which may then detract from their being able to develop a strong sense of social presence and flow. This may then negatively impact their purchase intent as the mental state of flow has a strong, direct impact on intentions to purchase virtual goods.

Future Research

We hope that by presenting some of the important issues framing the field of virtual world research, this special issue will help move the field forward. Contrary to claims that virtual worlds, and thus the relevance of virtual world research, are dead, we think that MIS researchers have much to offer to theory and management practices in this new and emerging area. In addition to the issues presented and discussed in the articles of this special issue, below we highlight a few additional areas that offer exciting research opportunities that have emerged since the call for papers.

Learning and Collaboration

Interest in game-based learning through virtual worlds has considerably increased in the past few years. Educational institutions are experimenting with new ways of learning for students of all ages while human resource departments are developing training programs for a variety of functions. From learning a foreign language to medical surgery to how to negotiate with a client or implement strategy, virtual worlds foster participatory, collaborative learning in a safe and engaging environment. They allow users to take on different roles in simulated surroundings and to learn from each other through conducting projects or tasks that might be impossible for the single learner or, for that matter, impossible to conduct in the physical world. Virtual worlds allow users to confront difficult problems, test what happens when they make certain decisions, and experience the consequences associated with those decisions (e.g., your patient dies or you lose your market dominance). Virtual worlds allow users to progress at their own pace, offering different levels of challenges and capabilities to ensure a skill–ability balance for users. Users receive immediate feedback and information about how they are progressing toward goals, which is difficult to mirror in a real world environment where feedback and goals are defined by teachers and managers. This enables experimentation, reflection, and the development of critical thinking, which has important theoretical and practical implications for training work teams, designing educational materials, and developing human resources in real world organizations.

Today, the vast majority of human resource managers would be surprised if a job applicant's CV were to come across his or her desk in which the applicant lists "WoW Guild Leader" as a work-related experience. Yet some job listings require this already today. Thinking about this more closely reveals that the skills acquired as a guild leader are precisely the skills demanded today by just about any organization that wants to be successful, including (1) leading a large virtual team of people with diverse demographic backgrounds from across the world without any formal authority over these individuals, (2) successfully developing and implementing strategies under pressure, (3) networking to acquire necessary information and resources, and (4) building trust and managing cross-cultural conflict without face-to-face communication. As the gaming generation enters the workforce, questions arise such as how these skills can be transferred into real world work situations and how managers who have several different generations reporting to them can best accommodate each generation's communication preferences.

Seeing the benefits of the anytime, anywhere global collaboration in virtual worlds, there is an increasing demand by multinational corporations to implement 3D virtual environments to improve work processes. Platform providers such as Teleplace, SAIC, Avaya, and ProtonMedia enable multiple persons engaged in diverse tasks spread across different time zones to collaborate in a secure corporate setting. Given the difficulties that we have in real world organizations with

managing the types of discontinuities associated with virtual teams, there is ample opportunity to investigate team processes and leadership in virtual world corporate settings.

Organizing Economic Activity

In 2006, Edward Castronova stated, "Clearly, if social activity migrates to synthetic worlds, economic activity will go there as well" (p. 255). We are witnessing this today as the market for virtual goods is growing at an exponential rate. While well-established companies in the gaming industry are responsible for a significant portion of this growth, another driving force is the rise of the avapreneur, or an entrepreneur conducting business through his/her avatar in a virtual world (Teigland 2010). In virtual worlds such as Second Life and Entropia Universe, avapreneurs develop and sell virtual products and services to others in the virtual world, receiving payments that can then be extracted and converted to real world currency. While the majority of financial transactions are micropayments of less than a few U.S. dollars, the record for the most expensive virtual good continues to be broken—the latest being the sale in February 2010 of a virtual egg for USD 70,000 and then in March 2010 of a virtual asteroid for a total of USD 635,000 in Entropia, providing the avapreneur with a net profit of around USD 500,000 in the span of five years. The skills necessary in this new world of commerce are already being built at a young age and that age is steadily declining. In the virtual world of Stardoll, with more than 50 million users interested in fashion, girls aged 12 are already experienced international entrepreneurs as they develop their own brands through the design, marketing, and sale of virtual clothes to an international customer base.

This ability to acquire and assimilate knowledge about customers in global markets as well as to leverage a network of partner organizations across the globe has been found by international business researchers to be critical to the successful internationalization of any firm. These activities have proven, however, to be particularly challenging for small- to medium-sized firms (SMEs) due to their limited financial and managerial resources and limited network and information resources. For example, in new product and service development, in which more than 50 percent of new products or services fail in any enterprise, a poor understanding of customer needs is one of the main culprits of internationalization failure in SMEs. Virtual worlds offer promise in leveling the competitive playing field between large multinationals and SMEs as they eliminate traditional resource constraints, providing SMEs with a platform for interaction and collaboration with innovation partners, customers, and other stakeholders worldwide. Indications of this trend are already being seen within service and creative industries, such as music, film, and fashion.

As a result, we are beginning to see the agglomeration of economic activity in which value creation is conducted by a variety of pro-ams, avapreneurs, freelancers, entrepreneurs, not-for-profits, and firms all within a virtual world. For example, in Second Life, the fashion industry comprises a complex web of actors consisting of top models, modeling agencies, and schools; photographers and photo studios; advertisers and fashion magazines; animators and avatar scriptors; shop and furniture designers; real estate and store owners; and of course fashion designers, all of which are spread across the globe. This virtual agglomeration of economic activity is in direct contrast to regional agglomerations of an industry (also known as clusters) in the traditional Cartesian sense in which individuals, organizations, and firms are in close geographical proximity to each other and attract others to translocate from across the world. This development is of considerable importance to economic geographers and in particular to regional and national policy makers as they have been promoting cluster development for more than a decade as a vital strategy to ensure regional and national competitiveness in today's turbulent economic environment.

Adding up the economic transactions of the various industries within a virtual world can also be quite substantial. For example, in 2010, Entropia Universe, with its own real cash economy, had a GDP of USD 428 million (in the range of the gross domestic products of smaller developing countries). As a result, national governments are beginning to take notice. The Swedish government granted the first real life banking license to MindArk in order to guarantee the financial deposits of the players of the growing number of planetary systems within the Entropia Universe. Interactive City will provide a venue for social shopping and the ability to shop for products in a virtual world together with one's friends on a variety of platforms (e.g., tablet PC, mobile phone, and PC). The development of alternative modes of payment, such as mobile payments and Facebook credits, will most likely further fuel economic activity and the growth of virtual world economies.

The above economic developments within virtual worlds clearly provide fertile ground for cross-disciplinary research between MIS and a diverse number of fields, such as accounting, economics, economic geography, entrepreneurship and small business venturing, finance, international business, law, marketing, strategy, and public policy. Research questions abound here such as what is the interplay between avapreneurship and entrepreneurship in the physical world as well as between virtual goods, physical goods, and global markets? What are the affordances that virtual worlds offer

organizations interested in internationalization? What are the implications of virtual economies, virtual currencies, and virtual goods profits for today's judicial and regulatory systems? What implications do virtual worlds have for national and regional policymakers?

Conclusion

As the Internet develops from web 1.0, enabling us to connect "to" the Internet, to web 2.0, where we connect "through" the Internet, to web 3.0, where individuals connect "within" the Internet (Kapp and O'Driscoll 2010), many researchers and practitioners are questioning how this development might impact society and the organization of economic activity. Many talk of the new generations entering the workforce, the "digital natives"—those who have grown up never knowing life without a computer, the Internet, a mobile phone, or virtual worlds. They are challenging many of the basic assumptions we have held since the time of the first industrial revolution regarding the firm, employment, and work, and are developing new forms of organizing economic activity. Clearly, it is too early to tell whether we are on the brink of a new Internet revolution and, if we are, what the new forms of organizing economic activity will be and how these will impact society. There are, however, signs in some industries, such as charity, film, finance, and software, of a migration from an economic model characterized by centralized hierarchical firms controlling in-house resources to a model of decentralized social production by communities of globally distributed workers. Virtual worlds are facilitating changes in our economic and governance models and will be even more instrumental as both the technology improves and the next generations who have grown up using these technologies enter the workforce. Will this lead to a mobility of labor that will impact national and organizational competitiveness similar to what we experienced first with the mobility of goods and then with the mobility of financial capital? The questions are many and of deep importance to firms, governments, and leaders.

In conclusion, we think that this special issue is perfectly timed to spark additional research in this area and to encourage researchers to take on new and pressing areas of research. Our hope is that by presenting some of the important issues framing the field of virtual worlds research through the articles and through discussing some of the recent developments in virtual worlds, this special issue will inspire and help move the field forward. The promise, potential, and problems associated with 3D virtual worlds need to be explored if our theories and research hope to reflect the emerging reality of today's organizations and societies. Additionally, our research must inform and help organizations change their processes and views about what is work and how it gets done in order to meet the expectations and abilities of the next generation of workers. We hope that both information researchers and scholars of other disciplines will take up these challenges because it will be instrumental for understanding the social, economic, and political dynamics of the future that will not necessarily adhere to the traditional boundaries and basic underlying assumptions we have been accustomed to in "real" life.

Acknowledgments

The special issue editorial team would like to thank the following individuals who served as associate editors: Brian Butler, Kevin Crowston, Pei-yu Chen, Mike Chiasson Ram Gopal, Marleen Huysman, Blake Ives, Bonnie Nardi, Peter Axel Nielsen, Wonseok Oh, Paul Pavlou, T. S. Raghu, Matti Rossi, Frantz Rowe, Suprateek Sarker, Noam Tractinsky, Tunay Tunca, Cathy Uruquart, and Ramesh Venkatraman. We would also like thank the many reviewers for the special issue, without whom the timely completion of this issue would not have been possible.

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