

## Towards a Framework for Evaluating Immersive Business Models: Evaluating Service Innovations in *Second Life*

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### Abstract

*Virtual worlds may be enabling technologies for the next generation of business models, practices and innovations in service. We situate our research within the field of service science and aim to evaluate service innovations. Because of Second Life's visibility as the de facto virtual world for commerce, we apply an immersive business evaluation framework against existing and hypothetical Second Life innovations. We then develop a framework based on Media Richness and Task Closure Theories to evaluate these cases. We thus progress toward theories of immersive business and concomitant evaluative frameworks for immersive business models. We posit the following characteristics of potential Second Life innovations based on our analysis: 1) feedback and interactions between users are not dissipated; 2) tasks that are profitable enough to support can be started and closed by users within Second Life; and 3) users are compelled to form a social presence, which is then leveraged.*

### 1. Introduction

*Time* magazine's Person of the Year for 2006 was *You* [15]: "look at 2006 through a different lens and you'll see another story, one that isn't about conflict or

great men. It's a story about community and collaboration on a scale never seen before. It's about the cosmic compendium of knowledge *Wikipedia* and the million-channel people's network *YouTube* and the online metropolis *MySpace*. This is a landmark recognition for the set of enabling technologies included in what is called Web 2.0. This also should serve as a reminder that only roughly ten years removed from when everyday people started using the WWW, its next version gained this much esteem. It is a call to ask and investigate what's next, to envision a Web/Internet 3.0. We believe that a significant piece of this vision will be the *3D Internet*—a Web of three-dimensional, computer simulated *virtual worlds*, visited by real people who interact with others, and are served by businesses that are hosted in these worlds [17, 32].

One of the most interesting things about virtual worlds is the notion of a goods and commerce. There may be for example a virtual car, which has apparent physical properties such as color, and can be driven in the world. Yet that car is not physically built. There is no manufacturing in a virtual world; if there is commerce, it is rooted in the transaction of services.

When we, as management and computer science researchers, became interested in investigating commerce in this truly novel domain of virtual worlds,

we sought a frame of reference for our investigation. We realized that the research would entail a scientific study of services that almost by definition are innovative because the virtual worlds in which they are performed did not exist until a few years ago. Therefore we situate our research within the burgeoning field of service science [6], and specifically as an investigation of new business models and service innovations enabled by emerging technologies [33].

There are numerous virtual worlds [4] on the Internet. Most fall under the category of Massively Multiplayer Online (MMO) games. These are capable of supporting thousands or more players connected via the Internet, playing simultaneously in a persistent world where world events occur continuously and effects of player actions persist [3]. The largest ones are fantasy role-playing sites such as *World of Warcraft*, *GuildWars*, and *RuneScape*, with eight, three, and one million subscribers, respectively [2, 30, 34].

In this scale of number of subscribers is a virtual world whose *raison d'être* in part is commerce is *Second Life* [22]. *Second Life* debuted in June of 2003, and is the product of the privately owned company Linden Lab. It is often described as a game, in the broad sense that its users participate because they enjoy it, but unlike for example *World of Warcraft*, there are no competitions or points to be won. It is intended, as its name indicates, to provide its participants with a "second life"—an alternate world in which the character, or avatar (an incarnation of the user) explores, mingles, chats, shops, works, attends concerts, or, in general, engages in a myriad of different pursuits.

Many of these activities, especially shopping represent commerce opportunities, and with over seven million participants, including numerous small entrepreneurs and multi-national corporations, *Second Life* is the ideal place within which to evaluate and test out virtual, or *immersive*, business models and service innovations. Said a representative from *American Apparel*, a retailer who has created a presence in *Second Life*: "There's a gap between the current online shopping experience and the next generation. A virtual world can at least bring you closer to the store experience without actually bringing you there. I'm not convinced *Second Life* is that answer, but it is a step along the path" [37].

So as in the early days of e-commerce, norms are being extemporaneously developed, which means that currently there is no generally widely accepted, academically-oriented framework for assessing immersive business models. We view this as a truly exciting research opportunity, and present our pursuit towards developing an evaluating framework grounded

in established scientific and management theories in this paper.

To that end, the paper is structured as follows. In §2, we describe *Second Life* in more detail. In §3, we present a first-pass practical evaluation of existing and hypothetical *Second Life* innovations. In §4, we progress towards a framework based on theories from the Management Information Systems fields and apply them to these innovations. Finally in §5, we present concluding remarks and outline future studies to further refine frameworks and theories of immersive business.

## 2. Second Life

*Second Life* provides users with the experience of participating in a virtual world as avatars, which can be customized in a variety of ways. In addition to their more mundane abilities like walking, these avatars are also provided with the ability to fly and teleport. Importantly, *Second Life* is a social experience, with users able to see and communicate with each other, both publicly and privately, through media including instant messaging and a voice communication system that is currently in beta testing [25].



Figure 1: *Second Life* Homepage ([www.secondlife.com](http://www.secondlife.com))

*Second Life* has enjoyed considerable attention from both the news media and from real world businesses. Much of the attention paid to *Second Life* has been propelled by its embrace of open source software, which allows its users to design their own environments and virtual goods, and by its allowing users to retain intellectual property rights for their creations. Goods and services can be traded in both Linden dollars, which have a currency exchange of

about L\$250 to one US dollar, and in real world currency. Several users have become Second Life entrepreneurs, making a real world living by selling virtual goods and services, such as clothing, furniture, legal advice, and sex [16].

The extent to which users can customize their experiences is attractive to businesses and public figures as well. In the public sector, for example, Sweden has created a virtual embassy in Second Life, Democrat contenders John Edwards, Hilary Clinton and Barack Obama have opened campaign offices, and extremist French politician Jean-Marie LePen provoked a virtual riot when avatar protesters attacked his Second Life office [24]. Educators have also noted its potential, and schools including Harvard have conducted classes in Second Life [20].

Businesses have invested in a variety of business models on Second Life, despite a lack of any clear, indisputable evidence that a Second Life presence will provide a healthy ROI in the short term. Among the businesses that have established a presence are American Apparel, which sells both virtual and real clothes; Dior, which unveiled a new line of jewelry; LaCoste, which held a voting contest among avatars to choose a new clothing model; and Vodaphone, whose Second Life centre does not sell items but instead provides free virtual goods and an opportunity to explore the brand. For many, involvement with Second Life may be more an exercise in branding, or an opportunity to get a head start on the learning curve that they believe will be necessitated by a future demand for immersive online retail experiences. Several companies report that the opportunity to chat live with Second Life users is providing them with invaluable market research [40].

Whether the ROI of an innovation can be directly measured or whether the effect of running marketing and advertising campaigns is more indirect, there needs to be yardsticks against which innovations can be evaluated. However, practical frameworks to evaluate business practices and models on virtual worlds are not yet available. In the following section we present a practical framework for evaluating different kinds of service innovations in Second Life.

### 3. First-Pass Practical Evaluation

This framework is based on criteria used to assess student assignments from a graduate-level course on Services Science Management and Engineering taught at York University in Toronto, Ontario from January 2007 to April 2007. As part of their investigation into service innovations, students were asked to choose a services business or type of service (existing or made

up) and discuss innovation for that service business or type of service in a Second Life environment. Students looked at the innovation goal (such as attracting a new demographic, increasing customer satisfaction, building mind-share, growing revenues, cutting costs, building new partnerships, etc.) and how the Second Life paradigm could help achieve that goal. For example, what technical capabilities exist or would have to be made available in Second Life? Or how will peoples' second lives use, engage with, interact with the service?

One convention differentiates between e-commerce and e-business this way: e-commerce is the use of the Web and Internet to directly support selling and buying, whereas e-business is the use to support all business activities, including but going beyond e-commerce. Since we want to be inclusive of innovations beyond strict buying and selling on Second Life, we will abide by a similar convention to differentiate between *immersive business* (conducting business in virtual worlds), a subset of which is *immersive commerce* (buying and selling in virtual worlds).

Through a review of innovations currently available in Second Life and an analysis of the service innovations chosen by students for their assignment, we have categorized immersive business innovations into the following three classes: *immersive prototyping*, *immersive event simulation*, and *immersive commerce*.

**Immersive Prototyping.** Using an immersive environment such as Second Life to prototype service ideas can be an effective way to receive feedback on new ideas or try out new ways of delivering a service in order to improve implementation and delivery in a real environment. Examples of services innovations involving immersive prototyping that will be evaluated in this paper are:

- Evaluating virtual spaces: Starwood Hotels developed a Second Life version of its new concept hotels, Aloft. Though these new hotels won't physically open until 2008, the Second Life version opened in 2006. The aim is to test-market the design, including observing the spaces and furniture to which people gravitate and avoid, and traffic patterns, and to receive feedback from visitors. There is a physical replica of the building in White Plain, NY, whose details including aesthetical and architectural ones will be completed with the help of feedback and observations received from Second Life [18].
- Design Evaluation: Creating designs in Second Life and making them available to

avatars could allow a company to determine which designs would be most popular in real life. The items prototyped (e.g. car designs, T-shirt prints) in Second Life could be sold or given away in Second Life and their various popularities computed to determine which designs have the most promise in real life. An interesting hypothetical case is to move threadless.com, a Website in which visitors collectively select and publicize submitted T-shirt designs.

**Immersive Event Simulation.** Using an immersive environment such as Second Life to simulate real-world events to study people’s reactions to them is a service that can be provided. A big part of the service is to embellish the Second Life environment with customized features—e.g. forklifts to be used in dealing with a disaster—to make the simulation realistic as practicable. Examples of immersive event simulation services will be evaluated in this paper are:

- **Emergency Simulations:** Department of Homeland Security [21] and UC Davis medical Centre are but a couple of examples of organizations that are embellishing Second Life to develop simulations to train emergency response workers. In the latter case, workers simulated rapid setup of medical facilities in case of a national crisis [7].
- An interesting hypothetical case is a service that allows for simulating the planning of a wedding, including simulating the wedding day itself. Weddings can be complicated projects that cause much anxiety. The opportunity to virtually walk-through significant steps towards the wedding may relieve some anxiety for the wedding party.

**Immersive Commerce.** The very nature of the Second Life economy provides opportunities for companies and individuals to engage in commerce services in Second Life. In some cases, the goal is to exchange virtual goods for Linden dollars and in other cases, the goal is to use the Second Life environment to increase commerce activity in real life. Examples of immersive commerce will be evaluated in this paper are:

- **Retail:** The American Apparel Second Life space allows a person to purchase real-life clothing, much as it would be done via Website, as well as purchase virtual clothing for his/her avatar (at a price of less than \$1US).
- **Banking:** Virtual bank branches could be opened in Second Life that link directly to real-world bank branches. The virtual

branches could be used to deposit and borrow Linden dollars and the links to the real branches would provide easy ways to exchange Linden dollars for real-world currency.

**Evaluating Service Innovations Using a Practical Framework.** The example services innovations listed above can be evaluated using the following criteria:

1. **Uniqueness:** Does the innovation meet a need that cannot be met using more traditional service delivery paradigms or environments (such as a traditional Website, face-to-face store, phone, email, or mail)?
2. **Technical Feasibility:** Is the innovation technically feasible in Second Life?
3. **Collaborative Nature:** Does the innovation make use of collaborative aspects of Second Life?
4. **Social Implications:** Does the innovation potentially have problematic social, privacy, and legal implications?

The following table presents a framework for evaluating each of the six examples of Second Life service innovations presented in this paper using the four criteria above.

	Uniqueness	Technical Feasibility	Collaborative Nature	Social Implications	Overall Evaluation
<b>Immersive Prototyping: Hotel</b>	Using SL feedback to modify physical replica is novel	Currently being done	Yes in the sense that many provide feedback	There may be some privacy concerns	Highly Innovative
<b>Immersive Prototyping: threadless.com</b>	SL does not offer much more than traditional web	Many designs would be feasible in SL	Designs are judged by collective but not necessarily synchronously and	There are few social implications	Somewhat Innovative
<b>Immersive Event Simulation: Medical Centre</b>	Somewhat novel: In essence, a simulation within a simulated world	Feasible	Very collaborative	Few	Highly Innovative
<b>Immersive Event Simulation: Wedding Planning</b>	Similar to above	Feasible	Not as many opportunities wherein collaboration with large #'s of people is needed	There are few social implications	Somewhat Innovative
<b>Immersive Commerce: American Apparel</b>	Yes insofar as they are selling virtual goods	Feasible	Not much	Few	Somewhat Innovative
<b>Immersive Commerce: Banking</b>	SL does not offer much more than	This is technically feasible in	Unless it facilitates avatar to	There are large tax and legal	Not innovative

	traditional web other than a 3D bank branch	SL	avatar commerce, it is not overly collaborative	implications & are subject to Linden Labs' laws	
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**Table 1. Evaluating Service Innovations Practically**

This analysis hints that there may be fewer innovation opportunities with immersive commerce than with immersive prototyping or event simulation. For strict buying and selling of real-life goods, a Second Life store or bank may be worse than a 2D Website. Starwood’s prototyping of Aloft is more compelling than threadless.com because the former really cannot be done via a Website. Also UC Davis’ event simulation is a more compelling innovation than wedding planning because it really exploits Second Life’s capability to model interactions between large numbers of participants, which for the most part isn’t necessary for wedding planning.

#### 4. Theoretically-Grounded Evaluation Framework

Any real thought of immersive business truly only came to light with the raised visibility that Second Life has garnered circa 2005-6. The notion of immersive business is so new that practical frameworks as presented in the previous section are rare, never mind evaluative frameworks that have more theoretical grounding. In this section, we motivate and present such a framework, which we have initially grounded in theories from the Information Systems field.

It is reasonable to evaluate immersive business innovations based on management research frameworks from strategic management such as the Value Chain [27] or Resource Based View [1], or from marketing, such as Mass Personalization [13] or Services-Dominant Logic [38]. We motivate our evaluative framework from another yet perspective, management research in Information Systems. We do this for the following reason. The rationale for many immersive innovations is that the innovated service is superior to both the traditional e-business and traditional physical experiences; that is, the immersive experience is better than the “clicks and bricks” experience. It would seem natural then to apply frameworks that were used in the incipient days of e-business to show when and how “clicks” would be superior to “bricks and mortar.” Many of these models and paradigms came out of the Management Information Systems field.

A noteworthy one is Media Richness Theory (MRT), which is founded on the assumption that individuals, groups, and organizations process

information to reduce uncertainty and unequivocal [10, 14]. Uncertainty is “the difference between the amount of information required to perform the task and the amount of information already possessed,” and equivocality is defined as the ambiguity inherent in the task caused by conflicting and inconsistent interpretations and expectations. When tasks entail processing highly equivocal information, as is required for example in collective bargaining, then the medium that supports communications and information processing must be rich. Therefore face-to-face meetings between participants may be necessary. Conversely if processing of unequivocal information such as filling out a standard form is the task then a less rich medium such as an email may suffice [8]. A face-to-face meeting is “rich” because gestures, facial expressions, surrounding contexts, and other sensory cues provide rich supplementary information beyond spoken or written words.

Richness is characterized by the ability to provide feedback, multiplicity of cues, variety of languages usable, and ability to provide personal focus. Of course, the cost of having a meeting is much more than that of e-mail, which does not require synchronization or co-location. However e-mail is devoid of much of what makes a face-to-face meeting “rich.” In this theory, a hierarchy is presented from the richest media, which is face-to-face; to telephones; to written, addressed documents; and to the least rich media, unaddressed documents [9]. MRT has been applied to explain preferences between e-mail and voice mail [11], and between different technologies for computer-supported workgroups [5].

MRT is a highly acknowledged theory for agents’ media choice that focuses on the fit between the task and the medium (for reviews of other research that focuses on task and medium, see [28, 35]). An alternative class of research focuses instead on availability of communicators and social environment as determinants for media choice [23, 31]. Important within this class is Task Closure Theory (TCT). This theory posits that the ability to effectively “close” a task is a key driver for an individual’s media preference and adoption [26, 36]. In particular, the availability of the recipient and the sense of social presence supported by the medium affect the perception that the task is closed. For instance, closure is achieved by clicking on the “send” button in e-mail. In contrast to MRT, face-to-face may not be a preferred, not because of costs, but because closure cannot be achieved unless the recipient is available.

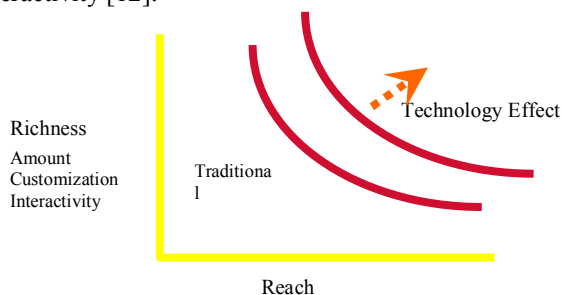
The basis of this theory is that enhanced ability to achieve closure will lead to lowered task fragmentation and job stress. The need for closure however may be moderated by the degree of social presence deemed

required. For example, as much as it may be desirable to bring closure to an unpleasant task such as laying-off an employee, it is not socially acceptable to do so via e-mail or voice mail. TCT has also been applied to explain preferences and adoption of e-mail [19] and groupware [29].

By fusing elements from these two theories, we can distill the following factors that affect adoption of information technologies:

- From MRT
  - Feedback capability
  - Multiplicity of cues
  - Language variety
  - Personal focus
  - Cost
- From TCT
  - Recipient/participant availability
  - Social presence

We can arguably generalize that physical commerce entails richness of media but at higher costs, whereas e-business facilitates task closure and drastically lowered costs but sacrifices media richness and social presence. The litmus test of an immersive innovation is whether it leads to a more advantageous trade-off, e.g. drastically lowered costs with only a marginal decrease in perception of social presence. The graph in Figure 2 from 1997 illustrates an advantageous trade-off of e-commerce versus physical commerce. It denotes that sites like eBay and Amazon can reach significantly more customers than traditional merchants, but yet not greatly sacrifice richness of customization and interactivity [12].



**Figure 2: Reach/Richness Trade-Off of Traditional E-Commerce**

We can now evaluate the potential innovations from the previous section according to a lens rooted in Media Richness Theory and Task Closure Theory.

**Evaluation of Feedback capability.** A physical site with attentive sales representatives will generally provide greater interactive feedback capability than a Website. Because of the expectation that feedback will be heard, customers will more readily provide feedback, as opposed to clicking on the “Contact Us,” button on a Website, an exercise which many

customers may believe is futile [39]. One of the few advantages of a Website is the completeness and efficiency of archiving and searching textual feedback from customers. In contrast, a comment made to a service rep may not be acted upon and never recorded.

A truly innovative service would offer both types of advantages. We believe that immersive prototyping a la Starwood Hotels can. There is the opportunity to provide feedback when and while the user is actually experiencing the hotel. To some extent, this opportunity is actually better than say real-world surveys since in Second Life, and unlike Websites, there is a natural fluidity in switching between locomotion and dialogue. It would be the immersive equivalent of walking around the physical hotel, making comments, and having all of the comments recorded for later perusal.

Another compelling innovation is immersive event simulation like the UC Davis Medical Center case. A real-life simulation would be preferable but is likely to be substantially more expensive, e.g. the cost of co-locating participants, and disruptive, e.g. shutting down city blocks to run a real-world simulation of, say, a terrorist attack. However in order for an immersive simulation to be compelling, what can be learned from a simulation cannot be substantially less than a real-world simulation. In the case of UC Davis Medical Center, the lesson-learned is how emergency workers react to and interact with each other in simulated scenarios. The simulation is a closed system within which feedback and interactions are not dissipated, but rather observed and recorded. That is, the capability to support participant feedback inherent in this immersive event simulation is the single important aspect that makes it compelling.

The ability to take advantage of feedback capabilities in immersive environments is an example of a measure of Uniqueness in our practical framework. The Starwood Hotel example scored very high in the Uniqueness criteria and the UC Davis Medical Center example was rated somewhat novel.

**Multiplicity of cues.** Obviously relative to virtual worlds, there are many more cues in the physical world and less in a Website. A truly innovative immersive service must exploit the additional 3D cues possible over a Website. A service that does not cannot be considered innovative. For example, evaluation of the aesthetics and functions of a hotel benefits greatly from immersing an avatar in a 3D hotel. However a simple T-shirt is for the most part a 2D object. Therefore the case of a hypothetical threadless.com site on Second Life would not be considered innovative. Even though this case is an example of immersive prototyping, 2D prototyping is sufficient for such a simple product.

One of the goals for immersive business design should be to steer the user towards actionable cues but away from distracting ones. The challenge in doing this is one of the reasons why buying at American Apparel's Second Life storefront, at least right now, is not compelling: "The user interface is not particularly intuitive. It took me a while to figure out how to buy something... We've all become accustomed to how an e-commerce site works, but on Second Life, those conventions haven't really been established [37]." As a result buyers are not sure how to approach a transaction. Until these issues are resolved, Second Life storefronts of large retailers may represent marketing and advertising opportunities, but not necessarily venues for direct monetization.

Multiplicity of cues relates to the Uniqueness and Collaborative Nature criteria in our practical framework. Uniqueness measures whether the innovation meets a need that can't be met by more traditional paradigms. In this case, innovations which take advantage of the ability of users to observe multiple cues, score high in Uniqueness. Similarly, innovations which exploit the social nature of the Second Life environment, are most likely using the fact that users can observe multiple cues from others.

**Language Variety.** All media discussed herein support natural language communications, and in fact immersive business and Websites offer the additional flexibility of use of structured data for automatable tasks. Therefore it is difficult to argue that any immersive innovation is compelling based solely on this factor.

**Personal Focus.** Innovations such as customer relationship management software, collaborative filtering, and even RSS feeds have helped establish the paradigm of mass personalization. Still the most powerful way to convey personal focus is to actually have a company representative face-to-face empathizing and focused on a customer. An immersive innovation would use 3D cues to come close to face-to-face; that is, an interaction can be reasonably rich without requiring common physical presence, albeit the communication must be synchronous. The hypothetical Second Life bank, wedding planning event simulation, and Second Life threadless.com could succeed by emphasizing immersive personal focus, which would be beyond what could be offered via a Website.

Personal focus is another example of a Uniqueness measure in our practical framework.

**Cost.** To try to capitalize on personal focus for these hypothetical sites is not likely to be cost-effective however. Virtual banker tellers, wedding planners, and T-shirt consultants have to be employed even if they don't have to be co-located. Even then these sites would not offer the personal focus of a physical site.

Say they don't concentrate on personal focus. We've surmised that they are not substantially better than their Website counterparts vis-à-vis feedback capability, multiplicity of cues, and language variety. Thus they would not be superior to their counterparts versus rich media factors, but would be much more expensive to build and operate, given that their counterparts' Websites are already built and have established customers.

**Task Closure.** This is a powerful concept that explains in part the success of American Apparel in selling virtual clothing in Second Life, but also, the constraints it faces in trying to sell real clothing via their storefront. American Apparel didn't start off trying to sell virtual clothing; their customers demanded it. Yet they acknowledge that the effect of their storefront on real clothing sales has been rather paltry [37]. If a potential customer is tasked with buying clothing, then that task cannot be opened and closed within Second Life. Ideally, the customer would make the purchase at the virtual store and receive the shipped good in a few days. However because not all goods are represented in the store, the customer may get routed to the American Apparel Website, where the goods may be bought, shipped, and received. The task then entails crossing between virtual, e-commerce, and physical worlds with many opportunities for the task to not be closed. Contrast that scenario with the task of buying a pair of shorts for a customer's avatar. This task can be opened and closed entirely within Second Life. The problem there of course is that the nominal price of these shorts is less than a \$1US. This is not a viable monetization model unless the volumes are tremendous, and they really won't be for a while. In the same vein for the Second Life bank, task closure can be achieved within Second Life if banking is related to transactions on Second Life artifacts like Linden dollars and virtual properties. It cannot, if the task entails real-life banking activity.

Task closure also explains why Second Life event simulations are often compelling innovations. The task of learning one lesson in setting up an emergency response clinic can be opened and closed within Second Life.

**Social Presence.** Virtual world task closure can also be achieved when simulating wedding planning. 1) Lessons can be simulated on how to pick a wedding hall, 2) how to handle all the tasks as the wedding nears, and 3) the wedding itself and the reception can be simulated in detail. However simulation for the first two tasks seems like overkill. The third does seem fit to be simulated, but it would seem unrealistic to get many people from the wedding to commit to a time to run a simulation. The key concept to consider here is social presence. For the first two tasks, there is no need for a

large social presence; there would be no complex interactions between many people to study. A website or even common reading material will teach the desired lesson. As for the third, there is a need for a large social presence. However as much the wedding day may be monumental for a few, it really does not warrant the considerable trouble required to achieve social presence for an event simulation. Contrast this with emergency situation simulation, for which the trouble to achieve social presence is greatly outweighed by the public good effects of running the simulation.

The social presence factor in our theoretical framework relates directly to the Collaborative Nature measure in our practical framework. Clearly, service innovations in immersive environments should exploit the collaborative and social nature of the space.

Our theoretical framework addressed several additional criteria not explicitly measured in our practical framework, much of which was addressed practically as Uniqueness. The theoretical framework did not consider the technical feasibility nor social or legal implications of the innovations. The theoretical framework need not address these issues since the realm of what is technically possible will grow significantly with time and social or legal implications are also specific to point-in-time or place perspectives. It is expected that a theoretical framework will exist independent of criteria that change dramatically in relatively short timeframes.

## 5. Concluding Remarks

We believe that virtual worlds and the 3D Internet will serve as enabling technologies for the next generation of Internet and Web based business models, practices and innovations. We call this immersive business. Some part of real-life business entails manufacturing, transporting, and transacting physical goods. In immersive business, there are no physical goods, just services applied to virtual goods. Therefore we situate our research within the field of service science with the aim to understand new service innovations enabled for immersive business. Our ultimate objective is to develop theories of immersive business, from which practical guidelines will emanate. What is required to achieve this objective are some means to evaluate different immersive innovations. Because of the novelty of immersive business, there is however no apparent framework for this evaluation. We address this research opportunity in this paper.

Though there are many virtual worlds, the obvious test-bed for developing a framework is Second Life, which has a participant base of seven million that

includes many corporations who have created storefronts and presences. We believe that promising immersive business models in Second Life can be classified as immersive prototyping, immersive event simulation, or immersive commerce. We then apply a practical, first-pass evaluation of existing and student-conceived models along dimension such as uniqueness, technical feasibility, collaborative nature, and social implications. From this evaluation, we intuit that immersive commerce may not, at least currently, be a primary source of immersive innovations.

We then explore Media Richness Theory (MRT) and Task Closure Theory (TCT) from the Management Information Systems field to develop a more theoretically-grounded evaluation framework. We again evaluate the existing and student-conceived models this time along RMT and TCT dimensions such as capability to provide feedback, multiplicity of cues, language variety, personal focus, costs, task closure, and social presence.

From this evaluation, we make these preliminary propositions:

1. *Immersive models that create a closed system within which feedback and interactions are not diffused have the potential to be innovative.* This is because such models combine the rich opportunity to elicit feedback and support interactions, a positive feature of physical commerce, with the opportunity to the enhanced opportunity to record feedback and interactions, a positive feature of Websites. A case in point is the immersive prototyping done within Second Life to develop Starwood Hotel's new concept line of physical hotels.
2. *Immersive models that productively support task closure have the potential to be innovative.* In a closed system, those that can perform a task within the system stay, those that must leave to perform the task don't come back. Therefore there is a premium on ensuring that tasks can be both opened and closed within the system. And it must be ensured that that task is worth supporting. For instance both UC Davis' emergency response simulation and American Apparel's storefront support tasks that can be opened and closed in Second Life. Yet, solely from the perspective of direct monetization (and not for its marketing benefits), selling of virtual clothing for a buck or less is not compelling.
3. *Immersive models that exploit the need for virtual social presence have the potential to be innovative.* Another aspect that is common to Starwood Hotel and UC Davis cases is that



they are able to build and exploit critical mass. The hotel prototype is limited in value unless large numbers of the desirable demographic group provide feedback. If the task simulated doesn't involve many people and complex, unanticipated interactions and effects between them, it may be cheaper to send training tapes to some workers .

A closed system which does not dissipate feedback and interactions, which productively supports task closure, and requires and exploits large social presence, but does not require the multitude of cues, language variety, and personal focus of a face-to-face meeting is an ideal candidate for an innovative immersive business.

Our future work then is quite clear: to empirically test these propositions in order to refine the evaluative framework, further develop theories of immersive business, and to translate them into practitioner guidelines.

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#### Disclaimer

The views expressed are those of the authors and do not necessarily represent those of York University, IBM, York University, or E-Mergent Management Research.

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