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Property rights, legal issues, and business models in virtual world communities

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Abstract This paper uses a business model framework to help identify the issues that developers of virtual worlds have to address as their enterprises mature. While most virtual worlds have adopted subscription models there is an increasing trend toward selling digital items directly to users. This arises from the emergent markets linking real world currency to items existing on company servers. This practice has resulted in controversial and unresolved legal issues. Communities that arise from virtual worlds can be classified according to level and type of control. Lack of control can lead to a Hobbesian world of predation and vigilantism. Strong developer control can be exerted to protect users but communities adopting shared governance with users are likely to become more common.

Keywords Virtual communities · Property rights · Virtual worlds · Online games · Item trade · EULA

The rapid growth of Internet usage has enabled many new online communities to develop. A particularly interesting phenomenon that has arisen through Internet communities is the virtual world (VW). This paper identifies the challenges that developers of VWs will face in their efforts to find viable business models as they go through the second phase in the dynamic business model framework identified in [31]. These include challenges to control over their creations.

The financial success of online communities based on multiplayer game environments has been a bright spot among the many failures in electronic commerce initiatives. While this form of business has existed for less than a decade, it is growing rapidly and has become a mainstream form of entertainment in some areas of the world. Game environments are becoming more immersive and compelling and if this rate of improvement continues, such as through growing broadband penetration, they are likely to become as common as other forms

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of entertainment. This paper analyzes the issues facing developers of game communities in their goal of establishing viable business models.

1. Virtual worlds background

Since the advent of online games, many users have found real world value in the objects that they obtain in VWs. Users received over $5 million in exchange for digital game items in the final quarter of 2003, a 30% increase over the previous quarter [9]. This has occurred in spite of the efforts of some developers to shut down accounts of people engaging in this trade. The desire by some users to pay cash for digits on a server is a fascinating social phenomenon.

VWs existed prior to the commercialization of the Internet in the form of the multi-user domains (MUD), first developed by Richard Bartle and Roy Trubshaw in 1978 (Massively Multiplayer, 2003). Advances in technology allowed these text-based communities to develop into graphical worlds. The first commercially successful graphical world was Ultima Online, released in September 1997, and remains among the largest VWs with 200,000 subscribers, in spite of rapid technological advance by its rivals. Its success spawned hundreds of development projects, of which the most well known are Everquest, the largest in North America with about half a million subscribers, and Lineage, the largest in the world with four million users and 2003 revenues of $156 million (Massively Multiplayer, 2003). The latter was developed in Korea and has grown to become a mainstream phenomenon in that country, in part due to the rapid growth in broadband connections there. More Koreans play Lineage than watch television at night [28]. Virtual worlds were relatively immune to the bursting of the Internet bubble due to their immediate profitability. Currently there are hundreds of virtual worlds in development. As virtual reality technologies improve, broadband adoption grows, and subject matter covered becomes wider, there can be little doubt that online worlds will eventually reach mass markets throughout the developed world.

Few people could have anticipated the growth of small businesses oriented toward profiting from eBay in that company's early days. The auction site was initially seen as a service for collectors and a way of recycling unused items that would otherwise be sold at garage sales. Virtual communities have a similar potential to create new businesses. Virtual property is attractive as a source of income for traders because it has low transaction costs, is entertaining, and enables people with time to experiment with arbitrage. Many people enjoy the process of buying low and selling high and are willing to engage in such activities as a hobby.

Many of the early virtual worlds, such as Ultima Online, Everquest, Asheron's Call, and Dark Age of Camelot, have followed a swords and sorcery theme of medieval magic. While this may seem a narrow niche, many of the early adopters were familiar with Dungeons and Dragons among other fantasy environments. As a result, digital items have included swords, armor, jewelry, rugs, magical scrolls, and real estate such as houses and castles. Each of these games enables trade in these items through currency such as platinum pieces or gold. Persistent game items and currency almost always have real world value. This is also true of powerful characters that can only be developed by players over time. Non-fantasy themed games can just as easily develop virtual property that people value. The Sims Online has pets, garden gnomes, and a currency called simoleans. Even non-world like game environments, such as collectible card games can have digital items with real world values such as cards, avatars, and tournament tickets that players use as a de facto currency.

The advent of trade in virtual property will constrain the artistic freedom of game developers. It creates opportunities for new business models but increases risk and the level of involvement required by developers in the ongoing maintenance of the virtual world. Game

items that players use can no longer be seen as trivial and entirely subject to the discretion of the developer. When users associate these objects with values in real world markets, the developer might become liable for loss due to circumstances within its control. For example, systems used should be safe from hacking, cheating, and scamming. The company Arctic Ice in China did not sufficiently secure its systems from hacking and in 2003 lost a lawsuit in Beijing's Chaoyang District People's Court to a game player who lost virtual property (China Daily, 2003) [24]. This may be the first case of its type in the world but others are certain to follow. Game companies have hoped to protect themselves against litigation by explicitly claiming in end user license agreements (EULAs) that virtual property has no real world value. If courts find, however, that users have a reasonable expectation that these items hold value, the claim made in the EULA may not be sufficient to protect the developer.

It is therefore important for game developers to understand that games existing on servers where players can exchange or buy items require an entirely new mindset and skills compared to previous models. Developers are creating marketplaces. They need to understand economic theory and practice in the areas of money supply, inflation, input / output models, and arbitrage. They also need to ensure that their systems have a similar level of security to those of banks, particularly if the business model chosen explicitly recognizes that virtual property has real world value.

A successful game runs greater risks and this can be called the control paradox. Lack of control over behavior can attract a large number of users but little oversight could eventually lead to the demise of the business altogether due to anti-social and illegal activities. The control tension between members and developers will be further explored below.

2. Literature review

2.1. Profit motives in virtual communities

Technological advances are fostering new ways of interacting with people and new business models. This section presents scholarly work in the area of virtual communities. In these studies we see that online communities have evolved from being primarily scientific in the early years to becoming gathering places where people come together to share personal interests. We are now seeing yet another transformation where sophisticated technical capabilities are making it possible for the development of virtual worlds where people are not only interacting with others but engaging in commercial transactions.

Online communities began to appear soon after the advent of the Internet. Initially these groups were research oriented but once the network became available to universities people began to develop communities around their personal interests. These were for the most part people's hobbies and entertainment [36]. In these early days the most common technologies were e-mail and listservs that later evolved into bulletin boards and MUDs where people began to create fantasy worlds [8]. These were forerunners of today's graphical virtual worlds.

As online communities have evolved so has the research about them. Scholars have documented the effectiveness and use of virtual communities in society to foster, for example, civic behavior [3] and social resistance movements [12]. Companies have also realized the organizational and commercial and potential of this social phenomenon. As scholars have pointed out, virtual communities can be used to create, gather, organize, and manage knowledge [5, 11, 19, 39].

Virtual communities have been used as a management tool in organizations. Marketing departments have found that people's fascination with the product or service can help a company develop relationships with customers to generate loyalty [21, 39]. These communities nonetheless have not been easy to maintain and companies are often not prepared to deal with potential criticism expressed in these forums [29].

Scholars that have analyzed virtual communities, in general, have classified them according to their type of activities and membership. For example, [18] identified four categories of online communities: communities of transactions, communities of interest, communities of fantasy, and communities of relationship. Similarly Klang and Olsson [22] divides them into community networks, professional societies, personal societies and the "third place," where people go to meet with new and old friends. They also classify communities in for-profit and not-for-profit for both individuals and organizations. Klang and Olsson [22] identify four types of communities: the forum, the shop, the club, and the bazaar. The bazaar involves activities where the members themselves are buying and selling physical and now virtual products as well. This transition from non-commercial to commercial communities has resulted in exciting new developments. When companies first established VWs they probably believed that the primary revenue source would be from subscription fees and they probably did not expect users to see profit opportunities in the community.

Ginsburg's [17] study of chess communities documents how there were numerous people willing to pay for an Internet Chess Club membership and, even in a structured game such as chess, members introduced "chekels," a monetary unit that could be exchanged for dollars. It is thus not surprising to see that the social aspects of these communities are rapidly transforming into commercial opportunities for users as well. Many developers have wanted to discourage the profit motives of users. Lack of control from the company has resulted in unexpected concerns. Even though there are millions of people around the world who are active in these virtual worlds, scholars have only recently begun to understand the dynamics of these communities. This paper focuses on commercial developments and the opportunities and challenges for the developer as well as for the user associated with this type of activity.

2.2. Property rights in virtual communities

This section highlights the scholarly work that has been done in the area of property rights related to the Internet and, more specifically, recent contributions in the emerging research surrounding VWs. The Internet has often tested the limits of property rights law. Even in the early days of the Internet there was discussion of copyright for postings to bulletin boards. As soon as the Internet began to acquire greater capabilities, such as a graphical interface and hyperlinks, other challenges began to emerge. The publishing industry has had to adapt and develop new business models, but is still in flux [20].

With the commercialization of the World Wide Web, companies began to understand the importance of the medium for marketing and sales. Because it was possible to buy a domain name equal to a company's trademark, people began to profit from the sale of names that they bought before many companies realized the importance of the medium. Mueller has documented these debates [33]. The creation of Napster brought forward the issue of online legal and illegal music distribution. In this respect scholars have written about the ways intellectual property can be protected online [16, 27, 35]. Along with recommendations to protect intellectual property, there have also been concerns about the overprotection

of property on the Internet and a call for a more balanced approach to this new medium [23, 25, 26, 37]. This is the type of debate that is likely to be repeated in the context of property ownership in virtual worlds.

Faster processors, greater bandwidth, and sophisticated graphics have led to virtual communities where people are no longer simply talking about their hobbies. As Castronova has shown, thousands of people generate income by engaging in digital transactions. The income they obtain can be exchanged for real money through eBay and other marketplaces. As Castronova has famously pointed out, the GDP per capita of Everquest, is roughly equivalent to that of Russia [10]. Many people spend substantial amounts of time in these worlds and through their activities they can accumulate assets with real world value.

End user license agreements establish terms and conditions with respect to users activities and the content they provide: "[u]nder Sony's EverQuest EULA, every click and motion in the game is defined as 'uploaded content,' to which the player waives any and all rights of control [8]." Dibbell states [13] that EULAs are often ambiguous and many of the activities of the players justify their ownership of the items. These ownership issues need to be addressed. Ondrejka [34] found that in the Second Life VW users were creating items for sale from scratch using the world's modeling system. Because of the effort that users have put into obtaining and creating virtual property, many dislike the terms and conditions imposed by the developers [34] and there is debate about the property rights claims for items [23]. Some scholars have thus made some initial recommendations for a broader system of copyrights that can accommodate property ownership claims in these worlds [23, 41]. The debate over these ownership issues has only just begun and the results of this debate have the potential to radically change business models.

2.3. Business models and virtual communities

Business model literature has grown rapidly over the past five years and is helpful in understanding the challenges that VW developers and users are likely to face in their attempts to develop profitable businesses based on virtual property. This paper uses MacInnes [31] as the basis of analysis. After an extensive literature review it provides a four stage dynamic business model framework. Because business models are conceptualized here as a dynamic process we define business model as a dynamic process that encompasses a company's activities that would allow it to capitalize from the value it provides to customers which include technical efficiencies, environmental considerations, revenue streams, and innovation over time. The factors that affect the success of a company's business model at its early stages are different from those affecting the business at a more mature stage. In the first stage technical issues are of greatest importance. The second stage involves environmental factors such as laws; regulations regarding aspects such as copyrights, privacy, freedom of expression; and their affect on adoption. In the third stage, developers can begin to incorporate traditional business model factors such as revenue streams, marketing, and customer support. The fourth stage focuses on factors that will sustain the business. Figure 1 presents the four stages. It should be noted that the process is iterative and as the company evolves, new technical, environmental, and traditional business model factors will emerge.

Corporate and user models around virtual communities are beginning to emerge and companies still have many elements to work out. The following sections address each of the factors in the dynamic business model framework that can contribute to the success of a business model. Based on these factors it is possible to specify the challenges that virtual world operators will face as they move through different stages of development.

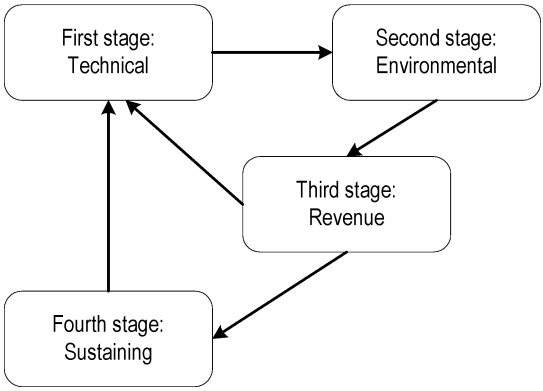

Fig. 1 Dynamic business model framework

3. Business model framework applied to virtual worlds

In the early stages of technological advance, technical factors are crucial to the success of the business. In the VW industry, technical factors can destroy a company because people have created assets in these VWs that hold considerable value. If these assets are lost due to technical problems or a security breach, a developer could be sued if it does not compensate the user. Thus in virtual worlds, where people hold property that may be valuable, security of the company's servers must be a priority. Privacy, security, and the integrity of the marketplace are factors that Duh [15] found will be of critical importance in this first stage because members need to have confidence in the VW provider.

Many of the technical aspects faced in the first stage of business models have been overcome. VWs are passing through the second stage where they have to overcome environmental factors. Environmental factors include legal, societal, and general economic limitations. Vasilopoulou et al. [42] point out that issues of regulation and policy are critical to this effect. Similarly Schroder and Yin [38], determined that security, organizational, and legal issues are the most difficult to overcome when companies make the transition from a traditional business model to one centered on electronic commerce. The legal issues that both of these papers identify will also play a role in these businesses as it is not yet clear in a legal sense, for example, who owns property in VWs, or whether the convertibility of virtual currencies gives VWs banking functions. As VWs appear to parallel the real world, governments may want to intervene when illegal activities occur or to protect assets if there is inflation.

The third stage of business model development focuses on traditional concerns such as revenue sources, customer value, costs, and infrastructure management. From the authors that have looked at single factors Wathne and Heide [43] emphasize the use of strategies that increase switching costs as a way of maintaining customer loyalty, or look at a way of creating and maintaining communities within the context of the business as a way of supporting and enhancing the economic activity from a website. VWs have high switching costs as a result of the property and persona that a participant in such a community develops over time. They may find it costly to switch to another VW and have to begin another persona and develop new relationships. It is important to note, however, that transfer of digital items into real world currency lowers switching costs. Wathne and Heide also suggest developing complementary products. Some companies running online games offer physical products that can be exchanged for their digital versions.

Amit and Zott [1] identify efficiency and novelty as two factors that can make a business successful. VWs provide novel features for their players and they are virtually limitless as users can add content, improving the richness of the experience. Among the most challenging factors that companies developing virtual worlds face are member development, community development, and asset management [44]. With some users developing their own businesses, developers lose some control.

4. Environmental challenges

In the second stage of the dynamic business model framework there are many environmental challenges to overcome. These are related to the legal, societal, and general economic limitations. Among these challenges is the control over property and the ability of players to profit from the activities taking place in the virtual world. The main challenges for virtual worlds at this stage are the legal issues regarding the ownership of virtual property and trade of these items.

4.1. Property rights and trade of digital items

Developers of online games have taken a wide range of approaches to virtual property that can be represented on a continuum. On one side are those that forbid any sort of exchange of virtual property outside of the game environment. On the other are those that sell a wide range of virtual items to players.

The general trend has been toward the recognition of virtual property and the attempt to profit from it. Shortly after the first commercial virtual world, Ultima Online, was established in 1997, eBay auctions appeared where players sold items that they had obtained in the game. Developers did not anticipate this phenomenon and they initially viewed it as a benign way of gaining additional publicity for their game. When Everquest was released two years later trade in its items developed into a thriving eBay market with thousands of auctions. eBay suddenly halted these auctions in 2001 when the game's developer, Verant, asserted that they constituted a violation of its terms of service and intellectual property. To date, Verant is the only company that has entirely shut down eBay activity in its online items.

Mythic Entertainment, creators of Dark Age of Camelot, has allowed eBay auctions to proceed even though they violate its end user license agreement. They also, however, took legal action against a particularly flagrant violation of the EULA. A company named Black Snow Interactive hired three shifts of unskilled Mexican labourers to harvest in game assets for later sale on eBay. The case was later dropped when the company ceased operations [14].

Many publishers, such as Electronic Arts (The Sims Online, Ultima Online), Microsoft (Asheron's Call), and NCSoft (Lineage) have tolerated trade in game items. Some games have incorporated virtual property ownership into their business models. While EA began by tolerating such trade in Ultima Online, in 2002 it began selling advanced characters for $29.95, thus gaining a share of the market itself and giving legitimacy to the idea that users can pay to avoid spending the time to develop a character. Microsoft also decided to permit the trade of game items for Asheron's Call and obtains a share of the trade by charging a fee to users who want to transfer accounts to others [14]. EA now offers the same service for all of its online games.

Linden Labs, the developer of Second Life, has made virtual items and real estate an intrinsic part of its business model. It allows players to buy and sell property but monthly subscription fees are in part determined by the amount of property the player owns. In January

2004, for example, an auction was held for a 65,000 square meter island in the game. The purchaser paid $1,200 to Linden Labs for the property plus a $195 monthly maintenance fee in perpetuity [2]. The purchaser revealed himself as representing a marketing company with clients in the fashion industry. Apparently, the goal was to use this virtual space in part as a promotion tool. The developer not only receives income from this but also could benefit from the development of its world by a motivated party with professional skills. Linden Lab continues to auction property and charge land maintenance fees in lieu of a traditional subscription fee. Users are enticed to pay these fees because they can charge for the content that they develop in the world. The developer will also reward contributions to the world that it appreciates with payments in U.S. dollars. Second Life was also the first VW to explicitly recognize the user's intellectual property rights over anything the user creates and owns on the game server. This means that players can realize real world profits from their content and businesses within the game without violating terms of service.

Developers of online role playing games are not the only ones offering virtual property that is being bought and sold for real world cash. A number of companies have tried to develop virtual versions of trading cards. The business models in all of these cases involved selling electronic cards or bundles of random cards. The value proposition is the same as in the real world. Users expect that some of these cards will rise in value beyond what they paid due to rarity and increases in demand over time. The first attempts, Sanctum and ChronX, were original designs of online only games but they had weak marketing and failed to develop sustainable businesses. In 2002 the first and most well-known trading card game, Magic the Gathering, launched an online version that has been financially successful, with many players spending thousands of dollars on virtual cards. The company receives millions of dollars in annual revenue without charging a subscription fee through direct sales of game items. Many users were dubious about the idea of paying more for the online versions of cards than they would for "real" ones but developer Wizards of the Coast, a subsidiary of Hasbro, overcame this barrier of perception by offering to redeem full sets of online cards for physical versions. This appears to be the first time that an online virtual entertainment asset has been linked to a physical one. The Lord of the Rings trading card game is now offering an online version that sells digital cards but does not offer redemption for physical versions.

Trading card games were preceded by sports cards and the most well known company in that area, Topps, has created a new online community based on trading digital versions of its cards that are limited in number and linked to mint versions that can be redeemed at any time. They have also used the Internet to provide new value to these cards by enabling collectors to compete with each other on their portfolios, and on the performance of the players they "own." They further keep track of the fluctuation in value of cards so that it is easy for collectors to see the potential for growth in their digital investments.

Perhaps the most ambitious attempt to link virtual assets to real world values is Project Entropia, a space fantasy role playing game. It was designed to enable people to set up virtual businesses where they could create and trade items potentially for profit. The developer would not charge a subscription fee but instead would build in a sort of depreciation to the items so that users would have to pay to maintain them. They would put money into the system through direct payment but could also withdraw real world money from the system at an official dollar exchange rate. This is a complex undertaking because it must balance user goals of entertainment and profit seeking potential with the need to maintain stable macroeconomic policy so that the community as a whole could not extract more real world money than they put in. So far this model has had few users but this could be due to failings in execution rather than concept.

4.2. Pitfalls for developers

In addition to the status of property rights there are other environmental challenges for developers. These are related to liability issues in the case of technical or business failure, privacy, and the regulation of activities that are subject to government restrictions. It should be noted that these environmental factors are also related to the technical challenges of the first stage. These technical issues are already part of the iteration illustrated in Figure 1 where the evolution of the business is leading to additional challenges in the technical realm. Virtual worlds transcend national boundaries and thus may face conflicts of jurisdiction.

Developers of virtual communities that incorporate digital property should be aware that there are many potential dangers. When they create items that have real world market value there will inevitably be disputes about ownership and theft. Virtual property creates incentives for hacking and stealing passwords. Keeping daily back-ups in several locations is crucial to avoiding a legal and public relations disaster. It is also important to design the system so that it minimizes the probability that account information can be stolen. For example some games have used the same user name on the account as the avatar name, and it is thus accessible to anybody in the game. If a user has a substantial amount of virtual wealth it is relatively easy to target that user since half of the information needed for hacking is known. It is also important that reminder questions be difficult for a stranger to answer. Stealing accounts will be easier if the question asks something trivially easy to guess such as "what is your favourite colour?" Above all, virtual world providers have to abandon the mindset that they are providing "just a game." Providers must establish and enforce appropriate rules, avoid making arbitrary decisions, and act to protect the value that exists in these virtual items. Those who continue to develop as they did before the advent of virtual property will soon find their legal bills mounting.

Developers should also plan for an end game. If they begin to lose money how are they going to escape liability if they shut down their world? EULAs may not provide sufficient protection if courts find that users have a reasonable belief that their items hold real world value. The legal system may be forgiving in cases such as Everquest, where the developer acted to shut down trade in game items. Developers that want to maintain creative control and ensure that players are on a level economic playing field may want to follow this lead.

With real world value comes opportunity for financial gain through fraud. This is mixed with a wide demographic that involves many young people with low financial resources, a sense that the activity is recreational (i.e. non-serious), and little understanding that theft of digital assets can be considered crime in the same way that burglary is. Online worlds also bring together people from many countries, which may have different attitudes, laws, and enforcement regarding intellectual property. Presumed anonymity reduces the perceived risk of online theft to the scammer. As a result, there have been many successful scams in online worlds. They include exploitation of design defects in trading systems, PayPal fraud, password seeking trojan downloads, and fake emails requesting passwords. Developers have to anticipate these activities and act quickly to punish them and minimize the probability that they can be repeated. At the same time the policing function can be difficult. Developers must also protect user privacy and deal with a mountain of claims of illegal activity of which many could be false.

Another problem that developers face is that they are the creators of a complex economy. Savvy users will exploit even slight design errors to achieve financial gain. Whenever there is a mechanical way of changing an input into a more valuable output, users will attempt to develop macros to do this automatically. This has been referred to as "gold farming" and

has been a successful strategy in several virtual worlds. The problem is that this debases the currency used in the game and makes the economy unstable. Virtual fortunes can be wiped out, perhaps with legal consequences if the developer is found to have been negligent. At minimum players may lose confidence and terminate their subscriptions. The move toward user created content also has implications for server stability. Outside code may cause server crashes unless the tools for creating content are closely integrated with the game. Addressing these problems will make virtual world platforms resemble operating systems in terms of function and complexity.

The cross-border nature of virtual worlds can result in a number of issues. Some activities in a VW may violate laws of some jurisdictions but not others. For example, business models built around profiting from the sale of digital items sometimes provide incentives that are similar to gambling [30]. For example, Magic Online and Lord of the Rings offer tournaments that require digital objects as payment and provide digital objects as prizes. Some jurisdictions may consider this to be gambling. There can also be age restrictions on gambling. Asheron's Call and Everquest have both had online casinos where users can play a game of chance to convert game currency into rare items [7]. Since both the currency and the items are easily convertible into real world cash there seems to be little difference between this activity and other types of online gambling. Some laws distinguish between games of skill and chance. Many governments have reporting guidelines and taxes on gambling winnings. It is also not difficult for players to create their own unregulated gambling businesses inside virtual worlds. Companies use their terms of service to put the responsibility on players to ensure that they are not violating local laws but this may not be sufficient to avoid legal action. Although gambling in virtual worlds is currently under the radar screen of governments this is likely to change.

Some virtual worlds may include adult themes, particularly in role playing games where the players create their own characters and the things that they say and do in game are difficult for the developer to control. Many virtual worlds may need to consider age verification for access to certain parts of games. Peter Ludlow, a University of Michigan professor, was doing research for a book on the Sims Online. He established an online newspaper (www.alphavilleherald.com) that included interviews that he conducted with users. He found cases of scamming, cybersex, and adult activities potentially involving minors that concerned him and reported these to the developer and in his newspaper. One of the more interesting developments was a protection racket as mafias were created to use the in-game reputation system to extort money in exchange for not destroying a user's reputation. In the absence of intervention by the developer, users responded by organizing a counter-mafia [28]. Electronic Arts did not appreciate the publicity he was bringing to the world and shut down his account, expropriating his virtual property. U.S. courts may be forced to rule on whether virtual worlds, while owned by private companies, are nonetheless public gathering places and thus subject to free speech laws. Developers have to consider how to manage negative publicity that players can create. Having a communications strategy is crucial and yet has been strangely neglected in a number of cases. Electronic Arts took a particularly big risk in releasing the Sims Online and allowing adult activities to potentially damage its successful offline brand, which is particularly popular with teenage girls.

4.3. Rules of behaviour in a virtual world: yet another environmental challenge

One of the most important considerations for developers is establishing rules that foster a positive community environment and minimize potential losses to participants. At the same time these rules should be flexible to enable governance of the community by the users

themselves. When Ultima Online was first released it quickly degenerated into a Hobbesian world of lawless anarchy where "player killers" were dominant. Developers soon realized that users wanted more structure. The initial rules that developers establish are a constitutional contract [6] and can be designed to reduce users' needs for predation and defense. These rules can include democratic institutions that enable the players themselves to negotiate post-constitutional contracts. Virtual worlds thus involve a great deal of social engineering and the skills required to manage the wide range of potential users are much different than in traditional game development.

Early developers of online worlds have wanted absolute control over the worlds they have created. This is understandable, given that there are profit streams at stake as well as the potential for legal liability. They have also seemed to be motivated by an artist's imperative. They created the world and thus they should have artistic control over it. Players do, however, contribute much of the value of the world. Their presence and activity is required for the world to be valuable. As these worlds evolve, developers should aim to devolve some of the power to users.

One of the main challenges for developers is to establish control mechanisms, a problem that can be called the control paradox. Ownership of game property and player expectations remain unclear. Figure 2 presents the distribution of controls and the likely types of communities that can result from these control levels.

Hobbesian communities emerge when the developer does not set or enforce rules and does not provide the tools to foster governance by the players. Developers do not consistently police user behaviour and may selectively enforce a code of conduct. This results in a chaotic world of scamming and griefing that go unpunished. This can also lead to vigilante activity when users feel that the situation is anarchic. For example, Professor Ludlow's critique of The Sims Online was that Electronic Arts was not exercising sufficient control over the community and only selectively enforcing codes of conduct. As a result a vigilante group that called itself

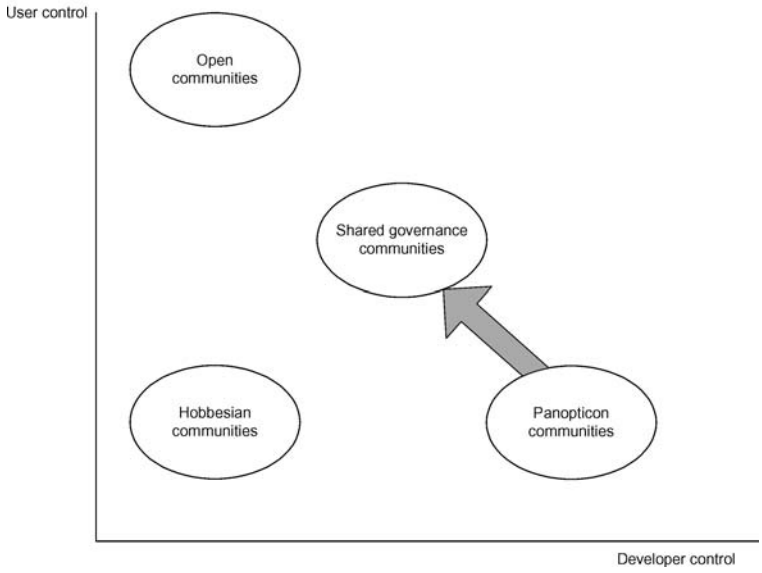

Fig. 2 Control in virtual world communities

"Sims Shadow Government" was formed to protect against the scamming mafias that had formed.

Panopticon communities, in contrast, are under the absolute control of the developer, who sets and strictly enforces rules without input from the players. They have strong and detailed codes of conduct, language filters, and terms of service. They ensure that the entire world is under surveillance in order to prevent socially undesirable behaviour. A particularly extreme example of this is ToonTown Online, a VW that does not allow any typing of personalized messages. The entire interaction with other users is through a menu system. Disney's goal is to create a world that is bulletproof to influences in any way unsafe to children. As a result, the players have no control over the environment and the company monitors and controls everything, including a formal approval process for avatar names. Most developers have aimed for Panopticon communities but there is a trend toward building in greater user involvement in governance. Panopticon communities will remain viable for users who want a controlled experience.

Open communities are entirely under the control of the users. Developers of such a community cede ownership of it to the players and maintain a minimal role if any in its maintenance. Successful open communities will have appropriate tools for self-governance. Many of the text-based MUDs, for example, became open communities. The development of such a community would generally follow open source principles. Sophisticated open communities could be developed in the future under scenarios such as non-profit research funding, turn-over of an unsuccessful business to the players, and volunteer development efforts by skilled and wealthy hobbyists. Given the vast expense of developing and maintaining a VW, there are likely to be fewer successful open communities than developer controlled ones.

Shared governance communities are the most likely scenario for successful future VWs. As developers have gained experience in managing social dynamics they are beginning to understand the incentives and rules necessary to enable joint governance of their creations. Since almost all current VW business models involve ongoing payments to the developer, they will want to maintain some control over community development. Sony, for example, is beginning to experiment with shared governance. Star Wars Galaxies and Everquest 2 are expected to have player run cities with elected mayors and players' councils that coordinate with developers. These are only first steps, however, and the Sony model remains closer to panopticon than to shared governance communities.

In their efforts to exert greater control over a virtual world, developers can impose technical and non-technical controls for both game related and behavioral aspects of the game. Table 1 presents some examples for each of the alternatives.

The controls that developers have imposed have primarily been non-technical, such as through EULAs and codes of conduct. Enforcement of these has often been inconsistent.

Table 1 Types of control

	Controls	
	Game related	Behavioral
Controls		
Technical	Not permitting trades between accounts	Language filters
Non technical	Game role descriptions	EULA Code of conduct Prohibiting eBay trades

5. Revenue streams for developers

Virtual world developers are still experimenting with business models. There are many first stage challenges related to security and they are now facing second and third stage challenges related to the environment and revenue basis. Virtual worlds offer many options for business models. While there are still several second stage challenges that these companies need to overcome they nonetheless need to discover their most appropriate sources of revenue. Most earn the bulk of their revenue through subscriptions although direct sale of digital objects and item transaction fees offer new opportunities. This section presents the basic alternatives.

5.1. Advertising

In the early years of the commercial Internet there was great optimism about advertising supported business models but after banner click through rates declined from 10% to well below 1%, there was also a collapse in advertising CPM rates. Only the most popular sites, particularly portals such as Yahoo, could earn substantial revenue from advertising. As a result, advertising based business models were no longer seen as viable for most projects. In-game advertising has also not caught on and could intrude on the flavour of the game. Ads for Coca Cola would detract from the atmosphere of a swords and sorcery game, for example. Worlds based on modern themes have greater potential. McDonald's, for example, has product placement in the Sims Online while Nike and Levi's are present in the VW There.

5.2. One time fee

Many publishers, such as Blizzard and Microsoft, offer free online gaming services for most of their products as an incentive to drive retail sales of shrink-wrapped boxes. They sometimes try to obtain incremental revenue by combining the online version with advertising but the bulk of revenue comes from the initial purchase. The advantage of the one-time fee is that the mass market understands and accepts this model. This method is, however, unlikely to work for virtual worlds because of the substantial costs involved in maintaining a secure server and databases.

5.3. Episodic

An episodic game involves purchase of new content to refresh the game. In this way developers hope to obtain ongoing revenues from the player rather than a one-time fee. For this model to work it is particularly important to have compelling and addictive content. Otherwise people will not pay for new episodes. NC Soft's Guild Wars relies on this model where exploration beyond the main continent requires additional payment. Some companies use elements of the episodic model when they release expansions to their world that can only be accessed through additional payment.

5.4. Subscription

The most common business model for virtual worlds is the monthly subscription. Games such as Everquest, Ultima Online, and Dark Age of Camelot have all been profitable for their developers. They have been among a relatively small number of successful content oriented business models on the Internet. These companies have also been able to sell retail packages even though they require monthly fees to play. This is indicative of barriers to

digital distribution [32]. Retail boxes are still needed to promote products and companies like Sony even sell subscriptions in shrink-wrapped boxes. One of the reasons for this is the need for alternative online payment methods to credit cards.

The problem with subscriptions is that mass market users are much less willing to make ongoing payments for games. As a result, games that were intended for mass markets, such as the Sims Online, have not succeeded in attracting these users. Hardcore players, however, are willing to pay to play. Early text-based virtual worlds, such as Dragon's Gate and Gemstone made substantial profits for a small operation by charging on an hourly basis. The advent of monthly subscriptions for similar products made meant that hourly rates were no longer viable. The willingness to pay of many hardcore users is much higher than what they are being charged through monthly rates, however. Companies can extract this consumer surplus through premium accounts and tiered subscriptions for additional benefits, including better customer support and features.

One of the advantages of the subscription model is that it protects developers from piracy. This is one of the reasons why VWs have had such great success in China. VWs have faced much lower competition because makers of stand-alone games have avoided selling there due to concerns about piracy.

5.5. Selling of items

Developers can also choose to sell items used in the game directly to users. This is potentially lucrative because the marginal cost of producing digital items is virtually zero. Once a company achieves sufficient volume to offset the research costs of creating desirable digital objects, any additional purchases will have a profit margin near 100%. Users, however, must have a sufficient enough incentive to collect these items. This can be achieved if their real world market value has the potential to increase over time to exceed what the player initially paid for the item. Thus, a successful model involving the sale of items should ensure that they are both rare and useful. This has been the premise of collectible card games since they were established a decade ago. Some of these games, such as Magic the Gathering and Lord of the Rings, have attempted to transfer this model online. Spending money brings advantage to players in this model, in contrast to the approach of subscription-based games, which tend to reward those who spend the most time playing. Another advantage is that people who pay to play in a tournament with prizes, for example, are much less likely to leave before a game is complete, thus resulting in a superior experience for competitive players. While this model is relatively new it will grow as smaller developers adopt middleware tools such as IBM's Business Integration for Games [40]. This approach allows developers to profit from in-game transactions by charging fees that would otherwise accrue to eBay while at the same time protecting players from fraud. Further development also will benefit from advances in micro-payments. In Korea, for example, billing through mobile phone accounts has resulted in many successful micro-payment based games where players can buy items and game time in such small amounts that they can become impulse purchases (Kosak, 2003).

In considering these alternative business models, the developer is also searching for a balance between the interests of the players and its own interests. The tension of control that exists between these two parties occurs because many developers believe that they should have control over the virtual world because they created it and they can best ensure that it evolves in the way they intended. Users on the other hand may feel that they are entitled to some control because they have paid fees and thus should be allowed to do whatever they want including running their own businesses. Managing this tension is one of the factors that will affect the success of a business model.

Table 2 Revenue models, control mechanisms and item trade policies

Title of online game and developer/ operator	Revenue stream	Level of control	Policy on real world item trade
Everquest (Sony)	Monthly subscription and initial fee for shrink-wrapped box	High	EULA forbids, eBay trade banned
Dark Age of Camelot (Mythic)	Monthly subscription and initial fee for shrink-wrapped box	High	EULA forbids
The Sims Online (Electronic Arts)	Monthly subscription and initial fee for shrink-wrapped box	Low	EULA forbids
Lineage (NCSoft Korea)	Monthly subscription, initial fee for shrink-wrapped box, alternative time cards for use in Internet cafés	High	EULA forbids, NCSoft lobbies government for protective rules
Legend of Mir (Wemade/Shanda China)	Monthly subscription, initial fee for shrink-wrapped box, alternative time cards for use in Internet cafés	High, game is operated by a Chinese company through a license from the Korean developer	EULA forbids
Magic the Gathering Online (Hasbro)	No monthly subscription, direct purchase of digital items from developer	High (will confiscate digital items from those who break terms of service)	EULA does not forbid real world trade but puts the risk at the level of the player
Second Life (Linden Lab)	One time fee, non-obligatory rent for online real estate	Low	EULA encourages player development and ownership of digital items
Guild Wars (NCSoft)	One time fee, optional fees for new content	High	EULA forbids

Table 2 presents some of the issues that prevail to this point, the level of control that the developer has over the virtual world and the policy that they have implemented regarding trade of digital items. The table shows that most developers have maintained a high level of control and forbid item trades involving real world currency. Most of these companies gain the largest part of their revenue through monthly subscriptions. There is, nonetheless, a lot of experimentation from companies such as Hasbro, Linden Lab, and NCSoft. It is also interesting to note that the greatest failure of a virtual world to date, The Sims Online, had very little control over player behaviour. As a result many anti-social activities took place without intervention by the operator. This occurred in spite of forbidding real world exchange in the EULA.

6. Conclusion

This paper uses a dynamic business model framework to present the challenges that the online game industry faces. It shows that the initial technical challenges have been overcome but new ones are beginning to emerge as the industry evolves. The technical challenges that happen in new iterations are no longer related to basic functions but to the environmental factors related to the running of a business of this sort. Companies need to be more concerned about security issues in order to prevent losses of digital items that players see as valuable and worthy of trade. While governments have not yet addressed on the status of digital property there has been at least one instance where a Chinese court found a company liable for the loss of digital property. Developers have believed that they are protected by EULAs that prohibit the trade of digital items for real money. They have, however, done little to enforce their rules. Some companies have even sold digital items for their own games, such as EA in Ultima Online. Others have taken a different approach. Linden Lab recognizes that digital items within the world of Second Life belong to players and even companies that wish to advertise real world products.

There are also many environmental factors that these companies need to address. At this point issues such as freedom of expression, control over user behavior, and jurisdictional disparities have not yet received the attention of policymakers because economic activities in these forums are an emerging trend. The expansion of broadband is likely to change this and as the business progresses it will not be surprising to find these companies facing legal challenges similar to those that Napster faced due to its inability to address environmental factors such as copyright protection. It is thus advised that these companies find solutions to these problems before they are challenged in court.

It is clear that along with environmental factors online game developers are still experimenting with revenue models. This paper described several alternatives. The most common is the subscription model but many companies are experimenting with other models such as selling items, additional content, and time-based play. These models will in turn have an effect on the degree of control that players believes they have over the activities they do in the virtual world and the items they own. If for example a developer begins to sell items this is an indication to the players that this is permitted and that players can freely exchange items for real world currency.

This paper thus helps identify the challenges that developers of virtual worlds are likely to face as the industry progresses. Existing literature on business models could not have provided sufficient insight to explain the issues facing this emerging industry. This is why the paper uses the four stage model. By expanding the factors to encompass technical, environmental and sustaining we are able to understand more clearly the actions that companies need to undertake to survive. If, for example, the original Napster executives had addressed copyright issues earlier, i.e. environmental issue under the dynamic business model framework, the company may have developed a business model that protected itself from litigation. It is important to note that there are hundreds of virtual worlds in development and relatively can be successful. A dot-com style crash in the area is almost inevitable but just as the fall of the dot-coms did not mean the end of electronic commerce, some VWs will also continue and thrive.

The phenomenon of online games and virtual worlds remains new and will be subject to debate for many years to come. It requires a major change in the assumptions under which the game industry has operated. There has been a lack of academic work on this fascinating social phenomenon that has only begun to be rectified. Next steps should include case studies so that researchers have more ground on which to build theory. As well, VWs have great potential

for large-scale experiments in psychology and economics, as Bradley and Froomkin have pointed out [4]. The coming years will see many new developments and will be a fascinating time to follow this emerging industry.

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