INTRODUCTION

Digital distribution for electronic commerce, sometimes described as pure electronic commerce (Choi et al. 1997), has great potential for both reduced cost and new creation of value for consumers. Consumer content such as news, books, music and entertainment software no longer requires physical packaging, shipping and retail display. There are of course many barriers that have prevented the mass market from using the new distribution channels (MacInnes et al. 2002) but reduced cost and disintermediation will make it compelling over the long term. Mobile entertainment is an example of a new pure e-commerce service that can create substantial value.

Content distribution through the Internet has been a bountiful phenomenon for consumers. As Internet Service Providers (ISPs) moved toward flat fees, consumers were increasingly able to obtain high quality content at an incremental price of zero. This meant that content providers received no revenue directly from Internet users while bearing the cost of their access. Newspapers, radio stations, television networks and game services struggled when attempting to charge users, usually relying on meager advertising revenue and cross-subsidy from physical distribution to justify their Internet operations. The primary

Abstract

It has been difficult to develop a profitable business model for Internet content. The emerging medium of mobile communications promises a new opportunity for this type of business because the gatekeeper for the medium, the wireless network provider (WNP), has greater control over what customers can feasibly do with their mobile devices. Higher barriers to entry and usage costs for mobiles should lead to the development of content business models that are more likely to generate profits. Within the mobile value chain, the WNP has the greatest bargaining power and can thus negotiate the largest share of profits. This paper examines the transformation of an industry as it moves toward a mobile, as opposed to Internet, focus. Mobile games are expected to generate substantial revenue but service providers will have to examine where they fit within the new value chain. The most appropriate strategy for WNPs is to leverage their control over wireless infrastructure and customer relationships. The management complexity of such a strategy is high but it is likely to generate the greatest profits.

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reason for this difficulty is that much of the content that consumers wanted to access was easily substitutable due to the low barriers to entry for Internet content provision.

The nature of mobile communications, however, promises a substantial improvement in profitability for content developers and distributors. Bandwidth limitations imply that a limited number of carriers, referred to here as wireless network providers (WNPs), will continue to charge users for access to the mobile spectrum. This gives WNPs the ability to charge for things that have been difficult to obtain revenue from on the Internet. For example, Virgin Mobile believes that users will be willing to use short messaging service (SMS) to play chess, thus generating revenue of approximately £8 for the 80 messages required for a single game (Wearden 2002). They believe this even though there are many online locations to play chess for free. Whether this specific model works is not as important as the general message: consumers are expected to pay for access to mobile content. This appears to be the model that mobile operators want to offer to customers. In contrast to Internet-based entertainment, mobile content providers will have to share revenue with WNPs. This presents an opportunity for the content provider to partner with the WNP and limit the number of potential competitors. The WNP is essentially a gatekeeper that can choose to provide exclusive content.

This paper presents a case study of mobile service provision, describing the transformation of the value chain (Porter 1985) and alternative business models for interactive entertainment. This is a fascinating period to study mobile services because the structure of the industry is in flux and so many participants are at an incipient stage. The primary advantage that mobile entertainment has over other forms is that it can be efficiently used to capitalize on down time. Users may not want to watch a video or play a game on their mobile phone if they are at home and have access to more immersive technologies but they may very well do so if they are waiting at a bus stop.

Like other mobile content services, such as music, gambling and information, it is difficult to predict the size of the games market when it matures. The one certainty is that it will be substantially larger than it is now. The ARC Group projects 848 million users worldwide in 2006, up from 43 million in 2001 (ARC Group 2001). Durlacher claims that revenues will exceed $8 billion in 2005. By the same year, according to Datamonitor, 80% of US and European users will play games on wireless devices (Wrolstad 2001) Entertainment already accounts for 52.5% of mobile phone usage in Japan (Houck 2001). The growth of wireless Internet access could also spur this market.

This paper begins by placing itself in the context of previous research on business model and value chain analysis. It then proceeds to describe the transformation in the mobile services value chain and the implications for business models. It then examines how this market may grow and the impediments that it faces, concluding with success factors for mobile games providers.

**LITERATURE REVIEW**

The emergence of the Internet as a commercial outlet has brought great opportunities for businesses. At first, the presence of an electronic network was seen as an opportunity for companies to reduce their transaction costs and deal directly with their customers (Wigand and Benjmin 1995). The Internet has indeed led to the development of business models that would not have been possible in physical commerce. In spite of the great expectations for e-commerce there were some major disappointments. As pointed out by Rogers (2001): ‘the heart of the e-commerce Revolution – using on line sales to replace traditional marketing channels at a lower cost, with more customization and higher levels of customer convenience – has not produced a business model that allows firms to translate Internet productivity into profits.’ This became evident in the first quarter of 2000 when the Nasdaq stock index collapsed and many Internet-based enterprises entered crises from which they never recovered.

Content-related industries such as books, newspapers and music have not generated substantial revenue on the Internet. These industries, much more than traditional ones selling physical goods, have found it difficult to compete against the abundance of free content. There are many reasons why they have not been able to translate their technology investments for Internet transactions into profitable business models. As Rogers (2001) points out, Internet markets resemble the economic model of perfect competition. There are low barriers to entry (and exit), intense competition due to the large number of players and products, rapid diffusion of knowledge and technology to consumers and competitors, as well as low product or service differentiation and brand loyalty. These are factors that apply to both digital and physical goods.

O’Reilly (1996) identifies characteristics of the publishing industry that could lead to successful business models. These elements nonetheless could also make it difficult for the industry to earn profits. The characteristics that he identifies are:

1. low barriers to entry made possible by easy-to-use desktop publishing;
2. abundance of niche publishers, from small to large publishing conglomerates that enable 50,000 books to be sold in the US every year;
3. abundance of business models due to the many outlets that publishers use to sell their content;
4. the presence of an open market where anybody can publish;
5. a large number of players that contribute to the success of the industry;
6. technology that is available to everyone; and
7. universal access – people can buy books from multiple outlets.

While these factors make it easy for anybody to become a publisher, it is challenging to attract and retain customers when there are such low barriers to entry.

There have been many studies of business models for the Internet (Alt and Zimmermann 2001; Fedwa, 1996; Goldman 1995; Mahadevan, 2000; Timmers 1998). They have generally focused on the conventional Internet and not mobile communications, which presents distinctive issues. Table 1 applies the business models that Timmers identified to mobile commerce.

Scholars who have studied content industries have identified some business models that could allow content producers to successfully sell their products. O’Reilly, for example, believes that brand names and trademarks are key elements for differentiation when there are abundant opportunities to consume content. He argues that there is room for creative use of advertising revenue as a way of providing useful information to potential customers. Because there is a vast amount of content he suggests designing user interfaces that makes it easy to find information. He also advocates the use of subscriptions.

Palmer and Eriksen (2000), on the other hand, identify ‘personalization, archiving and versioning, cost savings though low cost reproduction, subscription and pay per use revenue approaches and three approaches to advertising, including retail, classified, and more highly targeted market intermediation’. They found that while some content providers were successful generating revenue using these models others did not and provided much of their content for free. They therefore were primarily attempting to identify some of the models that content providers have used but for which they have not necessarily generated revenue. Studies of digital distribution for content industries have focused on the Internet. While some of the elements that they have identified could apply in a mobile environment others cannot because of the limited bandwidth and processing power of these devices as well as barriers to entry for wireless network provision.

Mobile commerce is in many respects different from traditional Internet commerce. While it has many limitations it should lead to successful revenue generation for content. In

Table 1. Adapting Timmers’ Business Models to Mobile Commerce

<table>
<thead>
<tr>
<th>Timmers’ business model</th>
<th>Explanation</th>
<th>Difficulties in a mobile environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration platforms</td>
<td>Tools for companies to collaborate on projects such as design</td>
<td>The mobile environment may be used for small collaborative projects but it is limited for more complex graphically intensive ones.</td>
</tr>
<tr>
<td>e-mail</td>
<td>A collection of e-shops</td>
<td>Although not impossible, the limited screen space of a mobile device can make it difficult for a user to navigate.</td>
</tr>
<tr>
<td>e-procurement</td>
<td>Electronic tendering and procurement for large businesses</td>
<td>Mobile phones may receive some usage in the field but these tend to involve large, complex, and often automated contracts that may not be appropriate for a mobile device.</td>
</tr>
<tr>
<td>Third party marketplace</td>
<td>Services provided by a third party: an interface to supplier products</td>
<td>Since these are intermediaries that support other businesses, users of mobile devices may have little contact with this type of company.</td>
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<table>
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<tr>
<th>Timmers’ business model</th>
<th>Explanation</th>
<th>Opportunities in a mobile environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-auction</td>
<td>Electronic implementation of a bidding mechanism</td>
<td>Mobile devices can help keep bidders aware of auction prices and enable them to submit bids.</td>
</tr>
<tr>
<td>e-shop</td>
<td>Web marketing: the use of the Internet to advertise</td>
<td>Mobile communications opens new avenues for advertising such as customizing ads for the location of the customer.</td>
</tr>
<tr>
<td>Information brokers</td>
<td>Information services</td>
<td>Many mobile users will be willing to pay for information.</td>
</tr>
<tr>
<td>Value chain integrator</td>
<td>Integration of multiple steps in the value chain</td>
<td>The mobile value chain offers many opportunities for integrators. A successful WNP, for example, will also be involved in marketing activities and aggregation.</td>
</tr>
<tr>
<td>Value chain service provider</td>
<td>Provision of a specific function of the value chain such as payment</td>
<td>While not all elements of the value chain can be accomplished through mobile devices, it is possible that some of them could. Mobile devices be used for payment, for example, as a replacement for ATMs and cash.</td>
</tr>
<tr>
<td>Virtual communities</td>
<td>Aggregation of members that share an interest</td>
<td>Mobile phones have been used to bring people together. More advanced communicators can bring people in closer contact with those who share their interests.</td>
</tr>
</tbody>
</table>
In this paper, we analyse specifically mobile games. Although it is only one of the content industries, the lessons from this industry can be applied to others. This paper focuses on two of the generic elements of business models identified by Alt and Zimmermann (2001): revenues and technological constraints.

**INDUSTRY VALUE CHAIN**

The mobile games industry is substantially different in structure from the traditional games industry. This can be demonstrated by examining the value chains of both. Game developers, publishers and platform providers face new challenges when they choose to enter the wireless sector.

As shown in Figure 1, the more mature game value chain consists of hardware developers, software developers, game publishers and retailers/aggregators. In contrast, the mobile game value chain replaces the latter two functions with mobile service providers (MSPs). Mobile service provision can be further broken down into six component areas: game platform provision, game co-enabling, wireless network provision, content and application aggregation, promotion, and measuring and billing. We now examine each part of the value chain in more detail.

- Hardware developers produce gaming platforms such as video game consoles and graphics chips. The mobile value chain replaces these with device developers who produce screens, handsets, processors, and in some cases may incorporate embedded games purchased from developers. They receive revenue primarily from the retail sale of their equipment. Their main location in the value chain is at the beginning because developers make design choices based on available hardware.
- Game developers design and programme the game. In some cases, they are employed by large publishing organizations but in most cases, they are relatively small groups focused on the creative process of development. There are some developers that focus on the wireless market while others have tried to migrate some of their talent from traditional markets toward wireless. This category may include the same organizations that are involved in this stage of the traditional industry. As in the traditional industry, the barriers to entry for developers are low enough and there are a sufficient number of people who want to be involved in game development that this group tends to have limited bargaining power. Developers can be funded by one-time fees, royalties, revenue sharing, and licensing fees for engines used in developing other products.
- Game publishers fund, promote, and distribute the products of developers. In the case of traditional games, they sell shrink-wrapped boxes to bricks and mortar or Internet retailers. Online games are made available by content aggregators such as Yahoo.com and Pogo.com. Some software vendors choose to be the exclusive aggregators of their own content, such as Sony's Station.com and Bluebird's Battle.net. The mobile game industry replaces these two intermediaries with a number of MSPs.
- Game platform providers attempt to integrate wireless games from many developers. They include entities that are focused on mobile games platform development, such as Cash-U and Mforma as well as traditional online players trying to leverage their previous experience in new wireless arena, such as Terraplay. They receive revenue from one-time fees, licensing fees, revenue sharing and development fees.

- Game co-enablers include all of the entities providing location, payment, content and advertising services to the operators. Their revenue comes from one-time fees, revenue sharing, and percentage of revenues generated by their payment systems.

- Wireless network providers are mobile carriers such as AT&T and VoiceStream as well as mobile data network providers such as GoAmerica. The latter are sometimes referred to as the companies that outsource the network. WNPs are well positioned in the mobile gaming value chain because they are able to leverage their control over infrastructure and customer relationships. As they are the ‘owners of customers’, they decide whether to put mobile games into their product portfolios. They receive revenues from usage, subscriptions, sponsoring and revenue sharing agreements.

The WNP or a partner with skills as an aggregator or publisher may do the final tasks in the value chain. Content and application aggregators may evolve from traditional content and entertainment providers such as Walt Disney or Viacom but the WNP may choose to be its own aggregator. Examples of wireless portals include Vivendi’s Vizzavi, BT’s Geni, or branded portals like Room33 from Sweden, IOBox, and AOL Anywhere. A WNP can choose to let a game publisher promote its own brand. It can also choose to let the publisher buy wholesale access and bill its own customers. The next section focuses on the level of involvement by WNPs in the provision of games to customers.

**BUSINESS MODELS FOR THE MOBILE GAMES INDUSTRY**

We will now examine the profitability of mobile games business models from the perspective of wireless carriers. The relationships pertaining to the game business are represented graphically for each model in Figure 2. Solid lines indicate strong relationships such as customer ownership while dotted lines indicate weak ones.

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**Figure 2. Alternative Business Models**

WNP = Wireless Network Provider, GP = Game Provider

Solid lines = strong relationships, dotted lines = weak relationships
Wireless network providers can obtain revenue from games without making any substantial investment. They can simply provide transport services to carry games without having any involvement in the marketing and branding. Revenue streams would come from wholesale agreements with game providers (GPs). They would receive a per-minute charge for WAP, per-message for SMS, or per-megabyte for GPRS. This model has the advantage of being easy for the WNP to manage because there is no need for partnerships. It can provide some revenue from increased usage of devices with little risk. The WNP, however, is giving up the control that it would otherwise have over the customer relationship and the content that is available. It would also not know whether minutes or messages were used for games or for other information services. If the gaming service becomes successful the GP would earn the bulk of the revenue. For this reason, this model is not ideal for the WNP.

The pipe-sales model differs from the pipe by its more direct relationship with the GP as well as increased connection with the customer. GPs can engage in non-exclusive agreements with WNPs, who handle billing directly with the customer instead of through a wholesale agreement. As in the pipe model, the revenue stream is based on minute, message, or megabyte usage. The advantages of the model include ease of management of the relationship with content providers, direct contact with customers through billing, and greater profitability than pipe due to billing services. The disadvantages are that it has some need for partnerships thus requiring management skills. It is higher cost and higher risk than the pipe model. This model has been employed by AT&T Wireless, for example, which distributed content developed by Unplugged Games.

Under the portal model the WNP has strong relationships with both the customer and the GP. It exerts bargaining power over the latter because it controls the customer relationship. In this case both the GP and the WNP promote the product, which the WNP delivers via a portal. The WNP is responsible for billing but does not use its own brand for games. Revenue is received directly from customers and shared with game providers but the GPs can also pay the WNP for better real estate such as a higher place on the menu. The advantages of the portal model include greater opportunities for revenue generation and strong customer relationships. The disadvantages are that it requires strong partnership skills and content management abilities. NTT DoCoMo’s I-mode service is a good example of successful implementation of this model.

The full portal model is the reverse of the pipe. It involves control by the WNP over branding and customer relations. The WNP simply buys games from developers and then markets them to customers as its own products. It completes all of the tasks on the latter half of the mobile gaming industry value chain including wireless network provision, content and application aggregation, measuring and billing, and sales and marketing. It receives revenue directly from customers and can vary the methods of charging based on demand for particular titles. The advantages of the model are that no partnerships are necessary and an overall brand strategy can be adopted. The disadvantages are that it requires substantial financial resources and cash flow. Content and brand management skills have to be high.

The four models for mobile games are represented in Figure 3. Each of the four can be evaluated in terms of relative revenue potential and management complexity. Management complexity can include partnership alliances, brand management, customer relationship management, marketing and sales coordination, measuring and billing capabilities, and provision of supporting functions. The figure shows that WNPs with weak management skills may choose the less lucrative pipe models. This choice would benefit content providers because it gives them stronger connections with customers and a greater share of the revenue. WNPs with strong management skills are better off, however, with the portal strategies which gives them the greatest bargaining power and control over the market.

It is useful then to identify contrasting implementations of the portal model, the one that most benefits carriers. NTT DoCoMo’s I-mode provides a single platform for game developers. Additionally, all of the I-mode enabled handsets are equipped with standardized c-HTML browsers. I-mode generates revenues by charging customers by data transfer as well as by requiring customers to pay monthly subscription fees to game services. I-mode collects payments and shares monthly subscription revenue with the GPs, keeping 9% to 12% of the subscription fee (EMC 2000). In March 2002 there were 32.2 million I-mode users even though access bandwidth is limited to 9.6 kbps (NTT DoCoMo 2002). An advantage of the service is that it is ‘always on’.

Genie is also a mobile portal and is fully owned by BT Cellular. Games are provided through SMS and WAP. Its revenue generation method, however, is quite different than for I-mode. GPs pay Genie to be higher on the menus.
Genie tries to leverage its control over access to customers. Additionally, Genie attracts advertisers that pay for space during game sessions. Genie has also introduced subscription fees for the most popular games.

**Revenue distribution and payment models**

Revenues accruing to the mobile games industry can be apportioned in a number of ways. Game developers often receive a one-time payment for their games. This contrasts with the typical royalty that traditional game developers receive from a publisher. Strong developers may be able to negotiate the licensing fee or revenue sharing options. Game platform providers would prefer to have a share of revenue but this can be difficult to negotiate from the WNP. They may however be able to collect development fees from WNP as well as licensing fees from other game developers that provide games based on their platforms. Game co-enablers include all of the entities providing location, payment, content and advertising services to the WNP. Combining these capabilities with game services, such as games that keep track of player locations, may bring added revenues.

A billing system should ideally be understandable to the client, easy to track, and have the ability to provide automatic revenue sharing. There are many pricing alternatives including a per-minute fee for access, as when using WAP on a GSM platform; a fee for data sent, as when using WAP on a GPRS platform or I-mode; a flat fee followed by free access; a subscription fee per game or bundling multiple games; a fee for each SMS message sent; a fee per game session or for access; sponsored games by content providers or game publishers; and sponsored games by mobile advertisement providers. These billing options can of course be combined, usually involving a subscription fee in addition to an access fee. There are also some creative strategies for earning revenue such as charging per object in the game and giving players assets and a profit motive for participating. This type of business model, applied in Internet based products such as Project Entropia and Magic the Gathering Online will, if successful, be applied in mobile games. Some examples of charging strategies are shown in Table 2.

**BARRIERS TO ADOPTION OF MOBILE GAMES**

The most important barrier to the adoption of mobile games is the need for standards. While there are projected to be one billion mobile phones in operation by 2005, there are many different implementations and games...
Table 2. Examples of Operators’ Charging Strategies

<table>
<thead>
<tr>
<th>Portal / Carrier</th>
<th>Country of Origin</th>
<th>Game Types</th>
<th>Charging Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-Mode (NTT DoCoMo)</td>
<td>Japan</td>
<td>MiracleGP – games</td>
<td>Monthly fee (~$2.50) + data transfer fee per 100 kbps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bandai – network games</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Around 36 sites providing games (2001)</td>
<td></td>
</tr>
<tr>
<td>Genie (BT)</td>
<td>UK</td>
<td>Genie Back</td>
<td>Monthly fee + charging per minute for game access</td>
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<tr>
<td></td>
<td></td>
<td>Genie FunTown (service with multiple games)</td>
<td></td>
</tr>
<tr>
<td>AT&amp;T Wireless</td>
<td>US</td>
<td>AT&amp;T’s Digital PocketNet service with multiple games</td>
<td>Monthly fee + charging per minute for game access</td>
</tr>
<tr>
<td>Vizzavi (Vodafone)</td>
<td>UK</td>
<td>Game service</td>
<td>Per SMS sent</td>
</tr>
<tr>
<td>Sonera Zed</td>
<td>Finland</td>
<td>Interactive games</td>
<td>Monthly fee + per SMS sent</td>
</tr>
</tbody>
</table>

cannot be designed for a single platform. Some phones have large colour LCD screens while others have small monochrome ones. Recent phones are enabled for Java while earlier ones are not.

Mobile game developers use development platforms such as Java-based J2ME, Qualcomm’s BREW, or Symbian’s EPOC. There are also wireless standards such as GSM, IS-95 CDMA, and GPRS. Moreover, mobile devices have different requirements for presentation standards (WAP, HTML) and device language support (HML, HTML, WML). In order for applications to run on a variety of mobile devices, there must be flexibility in application environments and programming languages. For applications to work on many devices substantial testing will be required.

This lack of standardization provides an opportunity for developers of other portable devices, such as Palm, Microsoft and Nintendo, to incorporate communications into what are already somewhat sophisticated gaming machines – the Palm Pilot, the Pocket PC, and the Game Boy. This process is already underway with the introduction of communications convergence devices in the case of Palm and Pocket PC. Unless consumers quickly show a preference for one of these the market could fragment further.

The mobile equipment industry appears to be on its way to developing an interoperability platform for gaming. In March 2001 Ericsson, Motorola and Siemens IC Mobile, launched the Universal Mobile Games Platform. In July Nokia joined the other three in the renamed Mobile Games Interoperability Forum (MGiF). They hope to develop a specification to enable game developers to produce and deploy mobile games across multiple game servers and wireless networks, and enable them to be played on different types of mobile devices.

There are a number of technical constraints that are limiting the sophistication of the games being developed. The small form factor and currently low processing capabilities constrain the potential detail of graphics. Likewise, low bandwidth and high latency limit designs for multiple player games, an issue that should be resolved by the roll-out of 2.5G and 3G networks, such as GPRS, CDMA2000 or UMTS. Short battery life also currently prevents phones from being used for more than a few hours before requiring recharging. This makes users less willing to spend precious battery time on entertainment when the phone might also be used for important business. All of these factors mean that mobile games will, for the foreseeable future, be less sophisticated than fixed location games. Mobile games are not, however, direct substitutes for fixed games because they are meant to be used for a different purpose, to occupy time that would otherwise be wasted, such as while commuting or waiting.

Another constraint is with regard to the way that consumers perceive the purchase of an intangible product (MacInnes et al. 2002). Almost all games are currently sold in physical packages at retail. Many consumers have been willing to pay free online games but reluctant to purchase something that is downloaded. The undervaluation of intangible products compared with physical versions combined with ease of copying and uploading has led to increased illegal ‘sharing’ of content. This phenomenon must also be overcome by related industries such as music, books and video. The mobile games industry can partially address this by embedding games in mobile devices but users may eventually tire of the lack of variety.

SUCCESS FACTORS FOR MOBILE GAMES DEVELOPMENT

Mobile-based content delivery poses challenges that are different than those for content providers on the Internet. Fixed location games tend to be graphically sophisticated and are often played in lengthy sessions. Some, though not all, types of hardcore game players value graphical sophistication and may quickly lose interest in less sophisticated games. They are still likely to play mobile games but they will tend to migrate to the most sophisticated system available. The hardcore game player that enjoys playing almost any game is likely to play regardless of the options available. As with traditional games, appealing to the mass market is likely to result in the highest revenues. For these users games with a simple design or that are already familiar, such as chess and cards, will be easier to sell.
Mobile games should be designed for sporadic use and should be easy to stop and return to because ‘down time’ is often short and can be interrupted unexpectedly. This means that multiplayer games may have to be rethought. Users on the go are unlikely to be willing to wait in virtual lobbies while games are organized and then have the game interrupted when another player has completed his commute or loses a connection. Single player games are then more appropriate. The only problem with this is that there is no technical reason why such a game would require a mobile infrastructure to deliver, except for the initial download. The most appropriate game styles for mobile communications are therefore what we refer to as asynchronous multiplayer games. These involve competition, cooperation and interaction with other players without having to directly connect with them for an entire game. For example, persistent virtual worlds such as Everquest continue to exist as users enter, leave, and return to the game. Their subscription-based model has proven to be one of the few content-oriented businesses that is consistently profitable on the Internet. Alternatively, developers can add a multiple player component to what would otherwise be single player games by collecting data from actions taken by previous players in a session and using it in new games. Mobile communicators are also an ideal platform for sports management games that use real world statistics and allow players to engage in fantasy transactions. As mobile devices begin to identify user location, games can be developed to take advantage of that information.

Communication among players can greatly add to the richness of the experience. Mobile devices can be used to build communities that will make users want to return in their free time to communicate with friends that they have made. In this way, a form of instant messaging can let players know when friends are available to chat. If this listing of friends can be organized in such a way that it links communities from particular games or types of games this will encourage greater usage of the system and value for customers.

Developers and service providers will have to understand, however, that partnering is important. The competencies required on both ends of the value chain are so different that it will rarely make sense to vertically integrate the development and distribution functions. Developers that produced simply for the Internet had very low barriers to entry so they could participate easily but at a very low probability of earning profits. Unlike the ISP, however, the WNP is a gatekeeper for content providers. Profits will therefore be made in mobile content but the bargaining power in the relationship is clearly with the party that has the closest billing relationship with the customer.

The mobile games industry is currently at an incipient stage. This paper has identified potential business models and the transformation that is occurring in the value chain. It has also contrasted the mobile games industry with the existing literature on Internet content. This is intended to be a first step toward understanding this industry. The next step is to study the development of these new businesses through in-depth case studies, particularly as the industry begins to mature. An example of a useful study would be to examine regional differences in the success of mobile game business models. These differences could be caused by factors such as price, standards, cultural differences and the availability of substitute technologies. There are many potential research questions. This paper provides a basis for beginning this task.

References


