



Realizing Potential of Mobile Gaming White Paper December 2009



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1 Executive Summary

With the rapid evolution of consumer lifestyles, the modes of playing games have increasingly become digital. Technological advancements coupled with growing consumer demand for superior gaming experiences have led to a continuous evolution in the modes of digital game play. With over 4 billion mobile users globally, advances in wireless technology have made mobile devices the next frontier in digital gaming. While mobile handsets still have some way to match the deep, rich gaming experience of dedicated consoles due to form factor limitations, their multi-functionality and widespread availability across a diverse user-base offers the scope to expand the 'digital gaming phenomenon' to a mass audience. Several favorable developments in the mobile gaming market, including the availability of diverse gaming genres, increasing sophistication in game quality, and growing consumer interest, position mobile gaming as a steadily growing segment of the digital gaming market. Informa Telecoms & Media estimates the revenues generated by the mobile gaming industry will increase from USD 4.3 billion in 2008 to USD 7 billion by 2013.

The essential factors needed to expand the mobile gaming marketplace appear to be in place. However, current statistics demonstrate operators have been unable to effectively tap consumer interest and convert players of handset-embedded games into active buyers. According to Informa's estimates, 157 million consumers downloaded mobile games in 2008, which translates into a mere 4% of the global mobile population. Primarily, the high price points associated with the prevalent per download gaming model have held back consumers from purchasing mobile games. To increase the overall size of the addressable mobile gaming market, operators will have to incorporate new and innovative business models.

This paper proposes mobile online games as a business model innovation for the mobile gaming industry. Comviva believes the mobile online gaming model that allows consumers to play over the operator's data network without the need to download games onto their handsets has the potential to adequately capture mobile gaming growth opportunities, and reach the critical-mass of consumers necessary to achieve mobile gaming success. Mobile online games will achieve this success by altering the existing constituents of the prevailing download model, namely, customer segments, value proposition, delivery mechanism, cost structure, revenue streams, and customer delight. This paper provides an insight into the value-mix offered by online mobile games and how it promises to broadbase the mobile gaming phenomenon, generating a unique value-proposition for various industry participants.



2 The State of Mobile Gameplay

Across cultures, people play games to relieve stress and boredom. With digital media, now, an integral part of consumer lifestyles, the modes of playing games have accordingly evolved. Rapid technological advancements coupled with growing consumer demand for superior audio-visual experiences have led to continuous evolution in the modes of digital game play. Gaming enthusiasts, today, have an option to download games on their personal computers or play online games which offers the added advantage to form and join online gaming communities or use dedicated devices such as fixed and portable gaming consoles. According to Comscore's *"World Metrix* Study", online or downloadable games websites (excluding gambling sites) attract more than 25% of the total worldwide Internet population.

The 'anytime-anywhere' availability of mobile phones coupled with improvements in device multimedia capabilities promises a compelling new dimension to digital gaming. Mobile gaming fits into the fast-moving lifestyles of today's connected, on-the-move consumers and offers a time-efficient source of recreation and enjoyment. Factors including affordability and personalization have made mobile devices a more ubiquitous media platform compared to dedicated digital gaming devices. Moreover, the availability of technologies such as WiFi, GPS, and 3G, combined with superior handset functions (e.g. multi-megapixel cameras, high quality audio, and Bluetooth connectivity) position mobile phones as an exciting gaming platform with unique and innovative potential. While handsets still have some way to match the deep, rich gaming experience of dedicated consoles due to form factor limitations, their multi-functionality and widespread availability across a diverse user-base offers the scope to expand the 'digital gaming phenomenon' to the mass market.

Figure 1: Gaming Time-Line					
2000s	A number of established console and PC gaming companies start investing in the mobile gaming market. Mobile gaming emerges as a prominent category of the digital gaming market.				
2000	Sony released the first 128-bit system with PS2. The PS2 also marked the rise in popularity of console games played over high-speed Internet				
Late 1990s	Nokia embedded the first mobile game – Snake – onto its handsets in 1998. Japanese success of I-Mode network based games created a boom for WAP-games – games mobile phone users could play through their WAP-browsers installed on the phone				
1995	The launch of Sony's PlayStation marked the arrival of 3D games. The device replaced the gaming cartridge with the CD-ROM significantly reducing game prices				
1990s	The 1990s decade saw the proliferation of gaming genres in the PC and console gaming markets				
1989	Nintendo released Game Boy, the first handheld-game console. The quality of games improved considerably				
Mid 1980s	The release of IBM PC compatible improved gaming quality in terms of graphics and sound capabilities. Apple Macintosh's support for the GUI attracted third-party game developers. Interactive, multi-player games began taking shape around this time				
Late 1970s	Atari launched the first multiple game console using gaming cartridges				
Early 1970s	The earliest form of video game consoles came into existence. These had no gaming cartridges, but only programmed games in the console				
Sauraa: Comvius					
	Source. Communa				



2.1. Crucial Enablers

Mobile gaming is emerging as a prominent segment of the digital gaming market. Between 2007 and 2012, analyst group CSMG estimates the mobile games industry will grow at a CAGR of 24.6% in the advanced gaming markets of Japan, Europe and the US, representing the fastest growing digital gaming market segment. In terms of revenues, Informa predicts mobile gaming will become a USD 7 billion global opportunity by 2013. These estimates are based on several crucial developments taking shape in the mobile gaming market, including the diversity in gaming genres, enhanced quality of games, growing publisher investments, and rising consumer interest.



2.1.1. Diverse Gaming Genres

Adventure and sports simulation were the dominant game categories in the early years of mobile game development. These genres attracted only a small segment of core gamers, typically men in the 18-30 year age group. As the gaming industry has matured, game publishers have introduced new genres of mobile games, ranging from action adventure and sports to life simulations, role-playing and real-time strategy. The availability of diverse game genres is expanding the mobile gaming market to a wider market demographic. CSMG notes the average age of a digital gamer has increased to 33 from 28 in 2002. Likewise, results of a survey conducted by Information Solutions Group revealed the growing interest of women across several casual gaming genres including arcade, puzzle, word, and card games.



¹ The research was conducted by Information Solutions Group on behalf of PopCap Games. The results presented in this paper are based upon online surveys completed by 2,191 randomly selected respondents, including 1,663 women, as part of the research.



Table 1: Gaming Genres – Core and Casual							
Come Dieu Trae	Description	Examples of Titles					
Game-Play Type		Core Games	Casual Games				
Role Playing	Players in the role of 'adventurers' are required to develop specific skill-sets to complete objectives and missions in a predetermined storyline	Final Fantasy	Club Penguin				
Real-time Strategy	Players have a macroscopic/ bird's eye view of the game world, and require careful and skilful thought to achieve victory	Age of Empires	Chess				
Action	Features long-term objectives with regular obstacles that must be overcome with the help of tools collected during gameplay	Splinter Cell	Super Mario				
Shooter	Focuses primarily on combat using a variety of weapons such as guns and missiles to achieve a series of objectives	Call of Duty	Phoenix				
Sports	Simulates the play of traditional physical sports with an emphasis on gameplay as well as strategy	Madden NFL	Mario Strikers				
Adventure	Open-ended gameplay; requires a player to solve problems through interactions with game characters and the game environment	The Longest Journey	Amazing Adventures				
Racing	Places the gamer in the driver's seat of a high- performance vehicle requiring him to race against other drivers or against time	Gran Turismo	Mario Cart				
Traditional	Includes board games, card games, and trivia games	-	Hearts				
	•		Source: CSMG				

2.1.2. Enhanced Gaming Experiences

Early game titles had limited audio-visual capabilities and allowed players restricted interactivity with game props. Emerging technologies are enabling the development of improved games, driving greater consumer interest in mobile gaming. Contemporary mobile games increasingly make use of sophisticated design, superior graphics and higher degrees of intelligence to better engage users and create immersive player experiences. Important features that have improved the quality of currently available mobile games are discussed below.

Game Intelligence

Although basic intelligence has been embedded into the mobile gaming plot since early development years, props in contemporary mobile games are developed with a greater degree of inherent intelligence to enhance the realism of the game and render the storyline more convincing to players. In the strategy game Warcraft 3, characters are built-in with the intelligence to form alliances, scout surrounding areas, and devise appropriate battle plans to defeat the player. Greater intelligence impacts gameplay in several ways including:

 Interactivity – Game intelligence enables players to dynamically interact with the game environment, resulting in increased user-engagement. In a combat game, for example, built-in intelligence allows players to hide behind objects for cover, use alternate routes to an important destination, and even make use of spots for ambush. A more advanced built-in intelligence adapts to the player's strategy and works around it, compelling players to consider alternate strategies to complete any goal in a given time-frame. This aspect is especially crucial in open-world



environments, such as the Grand Theft Auto series, where players can engage with most game properties at any point in the game.

 Complexity – Built-in intelligence within most contemporary games records previous actions implemented by the player and anticipates player decisions. This enables game developers to create innovative and non-repetitive challenging scenarios for gamers, driving immersive user experiences. Built-in artificial intelligence also ensures that difficulty levels continually increase as players progress in their game.

3D Graphics

Most often, the entire mood of a gaming session is created in the first few seconds following launch of a game. Games able to create a favorable impression within this short period set a positive tone for the entire session. Graphic attractiveness is a key element in creating enjoyable gaming experiences. With color displays, more powerful processors and larger memories, mobile phones have become capable of rendering graphics at interactive frame rates. Although the vast majority of games still utilize 2D graphics, developers are increasingly shifting focus to richer game content through 3D displays to enhance visual appeal and set the right mood for gaming sessions.

To engage users, several game publishers also allow players to modify game content. The power to modify existing, and create new styles of play develops players' affinity towards the game, resulting in increased frequency of gameplay. At the same time, game publishers allow game development to continue long after its release by permitting users to explore new playing styles. Continuing advancements in device capability and technological evolution should help drive even better quality games going forward. Location-based gaming, proximity gaming, multiplayer gaming and pervasive gaming are a few examples that have the potential to enhance mobile gaming experiences in the future.

How Companies are Redefining Gaming Experiences

The Sims

The Sims is a strategic life-simulation computer game developed by Maxis and published by Electronic Arts. It is a simulation of the daily activities of one or more virtual persons (called Sims) in a suburban household near SimCity. The game enables players to create Sims, customize what they look like, and control their lives and decide what they do. The player must make decisions about time spent in Sims' personal development, such as exercise, reading, creativity, and logic, by adding activities to the daily agenda of the Sims. Daily need fulfilment must also be scheduled, such as personal hygiene, eating, and sleeping. If Sims do not perform the necessary need fulfilment activities, they suffer consequences. For example, if they do not eat, they will die of starvation. If they do not have fun, they become depressed, and unwilling to do things.

Superior artificial game intelligence encourages players to make choices and engage fully in an interactive environment. It also provides players with an opportunity for self-expression and creative engagement. This has helped the game successfully attract casual gamers, especially women.

Electronic Arts' new release, The Sims 3, goes a step further and allows gamers to create Sim characters, as well as assign them unique personality traits that enable them to react to external situations accordingly. Players can also enjoy several online and community features, and can visit The Sims 3 store to purchase clothing and furniture for their Sims. Customization is a central tenet in the game. As Ben Bell, the Executive Producer of The Sims comments, "The reason I think it is so interesting for people is because the game immediately reflects who you are as a person when you're playing it."

Sources: PC World, All Academic, CSMG

2.1.3. Growing Investments

Mobile games were published predominantly by smaller independent companies, such as Jamdat, Gameloft, I-play, and Glu. In recent years, several established publishers have entered the mobile games business to leverage their success in the console and PC gaming markets. The ways in which console and PC game publishers have acquired a stake in the mobile gaming business include:

- Acquisition of smaller mobile game publishing companies (e.g. Electronic Art's acquisition of Jamdat)
- Mergers with mobile game publishers to form a bigger joint entity in the market (e.g. Glu's merger with ifone)



• Creation of their own mobile branches (e.g. THQ and Capcom)

The entry of bigger game publishers has increased monetary resources within the industry, resulting in greater sophistication and improved game quality. For example, new game players are increasingly investing in the development of cross-platform titles for the PC, the console, and the mobile handset. Alongside, major sports, leisure, and media brands seek to increase their presence in the mobile space and view mobile games as a key area to enhance their profiles. Media brands Nickelodeon and MTV have recently unveiled plans to substantially invest in the mobile gaming business.

2.1.4. Rising Consumer Interest

Mobile games have become an important constituent of leisure and entertainment for an entire generation of connected, mobile consumers. Several studies across geographies underscore consumer interest in mobile gaming. For instance, Synovate Young Asians Survey 2007 listed mobile gaming among the top 5 mobile phone features used by Asian youth. Likewise, in 2008, a Comscore M:Metrics study estimates close to a 100 million users played mobile games in Western Europe and the US.

Interest in mobile gaming is not a recent phenomenon. Consumers have frequently 'killed time' playing mobile games ever since Snake was loaded onto handsets in 1997. However,



Source: Synovate Young Asians Survey

with the increased availability and growing sophistication of mobile games, mobile gaming is emerging as the dominant mode of everyday entertainment for an increasing number of consumers. Game publisher Sorrent's marketing studies reveal mobile game players no longer fit the traditional profile of lone commuters waiting for public transportation. Most mobile gamers, on the contrary, play mobile games at home, several times a day, even though many of them own dedicated game consoles. The ability to multi-task while playing mobile games is an important motivation for mobile gamers. Sorrent's research found most users play mobile games while they are watching TV, SMSing, or listening to music.

2.2. Pricing Matters

The essential factors required to expand the mobile gaming marketplace appear to be in place. However, until now, operators have been unable to effectively tap the growth potential and encourage customers to actively download mobile games. A study conducted by analyst group ComScore "M: Metrics' August 2008 Benchmark Survey" across Western Europe and the US reveals more people than ever before are playing mobile games in these regions. Consumer interest, however, is limited to games pre-loaded onto mobile handsets, and has not translated into game downloads/purchases, primarily on account of the high cost per download. There is a direct correlation between the price of the game and the number of downloads per customer per month. For example, in Asia Pacific where the price of the game is between USD 1 and 2, the average number of downloads per customer per month equals 0.8. In Middle-East and Africa where the price per download ranges between 3.5 and 4 US, the number of average downloads per customer per month equals 0.4 and 0.25 per customer per month. (View Figure 6 and 7)





Current mobile gaming business models adopted by operators inhibit consumers from purchasing games. Until now, operators have largely followed a one-time purchase/download model to retail mobile games to consumers. Although certain operators offer subscription packages enabling subscribers to rent games for a limited duration, downloaded games are, by far, the most popular form of mobile game purchase, accounting for more than 80% of mobile game revenues. This category includes games downloaded to a user's handsets over-the-air and which are then played offline in a single-player mode. The download model has failed to enthuse a substantial base of customers on account of the following reasons:

 High Download Prices: Despite the interest to play mobile games, high price points inhibit users from downloading games onto their handsets. For example, Vodafone South Africa charges users USD4.30 for a single mobile game download, which translates to approximately 30% of the

operator's blended ARPU of USD14. Likewise, games on Etisalat's UAE mobile portal are priced at USD4 per game and account for 22% of the operator's blended ARPU. In India. leading operators charge users an average of USD1 (Rs. 50) per game download. However, Comviva's experience in deploying prepaid recharge solutions for operators demonstrates the majority of prepaid mobile consumers in India maintain an account balance of between Rs.10 to Rs.30. Taking these metrics into account, a price point of Rs.50 per game download appears highly unaffordable for an average mobile user.



• Limited Choice: One-time downloads restrict consumer alternatives for a wider variety of game titles, compelling gamers to play the same games repeatedly. To encourage a larger subscriber-base



to pay more often for mobile games, it is critical for operators to incorporate a model that offers a choice of games at reasonable price-points to consumers.

3 Reorienting Business Models

It has become critical for operators to evaluate the efficacy of their gaming business models. Although the mobile gaming business exceeds USD4 billion in global revenues, restrictive models pursued by operators have limited its reach to a small segment of mobile consumers. According to Informa's estimates, 157 million consumers downloaded mobile games in 2008. This translates to a mere 4% of the global mobile population. The small percentage of mobile subscribers who download mobile games today will not be the engine driving industry growth over the next years. Mobile operators, game publishers, and other stakeholders in the gaming ecosystem need to work together and make mobile gaming more attractive to the remaining 96% of mobile consumers. As customer-facing entities, operators will have to incorporate new and innovative business models to increase the overall size of the addressable mobile gaming market and encourage more people to sample with mobile games.



consumers to play over the operator's cellular network without the need to download games onto their handsets. With an online gaming solution, the operator integrates gaming into the network infrastructure nodes, including billing, OAM, CMS and provisioning – enabling the operator to build a vibrant gaming brand, which will reinforce customer loyalty when coupled with an improved user experience, usage flexibility, multiple pricing options and low device dependency. These consumer and operator benefits have the potential to adequately capture mobile gaming success. Mobile online games will achieve this by altering the existing constituents of the prevailing download model, namely, customer segments, value proposition, distribution channels, cost structure, revenue streams and customer delight. The upcoming section provides an insight into the value-mix offered by online mobile games and how it promises to broad-base the mobile gaming phenomenon.



3.1. Customer Segments

A clear description and understanding of existing and potential customers is integral to the success of every business model. Until now, the mobile gaming industry has focused on a small segment of dedicated mobile gamers with high monthly mobile spend. Beyond this segment of involved mobile gamers, however, there is a huge chunk of mobile consumers who are interested in playing mobile games but have resisted making a purchase or making frequent purchases due to a range of prohibitive factors inherent in the download model. For mobile operators, it is important to understand the needs of key mobile gaming target groups to ensure games are properly packaged, marketed and priced to achieve market success. Online games provide operators with the opportunity to address untapped market segments by offering them superior, connected experiences and greater value for their money spent.

A categorization of existing and potential mobile gaming segments vis-à-vis the segment's PC gaming practices is depicted in the following matrix:

Mobile Core Gaming Segment

Mobile core gamers actively play on their mobile phones. Users in this segment are most likely to possess advanced handsets and download games frequently. They can be subdivided into the following categories:

Core Mobile-Non PC Gamers:

A majority of users in this segment are gaming enthusiasts, but do not own an alternate gaming device, such as PC or console.

Core Mobile-Casual PC: Consumers who sometimes play over their PC, but are dedicated mobile gamers who value the 'mobility advantage' handsets provide. They can be



potential users for mobile online multiplayer games.

Core Mobile-Core PC: Consumers in this bracket regularly play games over the PC as well as their mobile phone. They are most likely high-income earners who have an enthusiasm to play games, as well as possess the financial resources to buy and download games.

Mobile Casual Gaming Segment

This segment of mobile gamers plays occasionally, mainly to kill time. Mobile casual gamers may download games once in a while, or play embedded games on their handsets. A number of plausible reasons hinder them from downloading mobile games frequently, including high download prices, and a lack of interest in spending money on mobile games. Mobile casual gamers have the highest probability to become active mobile online gamers as playing online offers them more value for little money spent. Mobile casual gamers fall into the following categories:



Casual Mobile-Non PC: For a majority in this category, the mobile phone is their only gaming device. They would mostly play to kill idle time in between daily activities. However, a section of gamers within this category might own PCs, but not play PC-based games due to a lack of interest. Many of them are likely converts for mobile online gaming.

Casual Mobile-Casual PC: These are mobile indifferent gamers and have no preference for a gaming platform. With the right strategy to tap their interest, they can be converted into regular mobile online gamers.

Core PC-Casual Mobile: Consumers falling under this category are avid PC gamers, but play occasionally on their mobile phones. A plausible reason for this is the superior gaming experience provided by the PC compared to the mobile phone. With mobile phones' advanced capabilities coming close to the PC, operators can effectively tap this segment of gamers.

Mobile Non-Gaming Segment

Core PC- Non Mobile-: The segment constitutes core PC gamers, who play real time multiplayer games and place high value on the gaming experience. Customers in this segment are unlikely to use mobile devices to play games because of form factor limitations. Due to the low penetration of PCs in emerging markets, (a mere 2.7% in India) non mobile-core PC gamers, constitute a small user segment.

Casual PC-Non Mobile: Users who play casual games on their PC, but never play games on their mobile phones are a potential category for mobile online gaming.

Non PC-Non Mobile: Non-gamers would be more difficult to convince than the other segments, as they first need to be introduced to gaming and then subsequently engaged with mobile online gaming.

3.2. Value Proposition

The value proposition customers derive from a business offering is a crucial determinant of its acceptability by the target audience. It is critical for mobile operators to outline the distinct benefits of mobile online games vis-à-vis the prevalent downloads model before undertaking a business model restructuring initiative. Answers to the following questions should help operators arrive at this:

- What are the unsatisfied needs that drive the behavior of targeted customers?
- Does the business model innovation (BMI) framework deliver differentiated benefits on these priorities?

The value propositions mobile online gaming offers customers include economized gaming through flexible pricing options, social/collaborative mobile gaming through mobile Internet connectivity, a diversity of game choice, and the ability to play new games irrespective of the mobile phone's memory limitations.

3.2.1. Connected Multiplayer Gaming Experiences

The ability to support real-time multiplayer gaming sessions is a promising dimension of mobile online gaming. The majority of games currently downloaded onto handsets can only be played in an offline, single-player mode against opponents within the game's storyline. Although some games do offer connected features, such as a centralized network-wide high score table to compare results from users in different locations, they do not really offer real-time multiplayer mobile gaming experiences. The advent of 3G networks provides operators with an opportunity to explore a wide variety of collaborative, multi-player games that leverage real-time communication as an integral part of the gaming experience. According to the Global mobile Suppliers Association (GSA), 275 operators across 116 countries have deployed WCDMA networks – over 90% of these have commercially launched HSPA (High Speed Packet Access). In 4Q 08, there were over 399 million 3G subscribers globally, predicted to grow at a CAGR of 40% between 2009 and 2013 – translating to an approximate 2.2 billion 3G users worldwide.



Mobile online multiplayer games offer users the opportunity to interact, collaborate, and compete against real opponents. Collaborative games create new occasions for communication, driving service consumption. For core mobile gamers, the compelling hallmark of multiplayer games - tens to thousands of users immersed in the same game world, playing in real-time for hours on end – when combined with the power of mobility offers an unparalleled gaming experience. Moreover, by using a mobile phone, gamers can play with friends at any time, from any location, allowing them to share experiences on their terms rather than those set out by the medium they are using. This is where mobile devices leap-frog traditional gaming devices: their always-on connectivity offers a sense of community far beyond that of a sometimes-connected device and thus the potential for a far more enriching experience.

The transition to mobile multiplayer games is an attractive proposition not only for mobile gamers, but also for network operators that will carry the online gaming traffic. The high-bandwidth, always-on requirements of collaborative games will exponentially drive service consumption and network usage, expanding the mobile gaming audience, market and revenue potential. If mobile online multiplayer gaming takes off, the growth in network operator revenues will be far greater than those realized by downloadable single-player offline games.

Figure 9: Evolution of Connected Mobile Gaming



Local Area Network

The original multiplayer experience, PC gaming over a LAN is still a pastime for many hardcore PC gamers

Massively Multiplayer Online Games (MMOG)

Online multiplayer environments like World of Warcraft have been running for some time now and boast millions of users. However, the time and commitment required to fully appreciate these titles means that this genre is still relatively niche

Connected Console Experience

More accessible and very popular, but still limited to those with a console and a subscription to services such as Xbox Live. Users are also limited to a static location

Connected Handheld Experience

Modern handheld consoles offer connected gaming with fewer constraints than those faced by console gamers, but to be connected a users must still be in range of a WiFi spot (or another player via Bluetooth) and have a dedicated games device

Mobile Connected Gaming

Connection is unaffected by the need to own specialized gaming equipment. Gamers can play and share gaming experiences whenever they wish to, wherever they are

Source: Nokia

Gaming Communities

The ability to communicate and collaborate in real-time as well as form virtual communities around shared interests and values are integral to digital lifestyles of new age consumers. With the emergence of virtual game worlds in fixed digital environments, participation is becoming more about the experience than the game itself — meeting up online with teammates and friends, developing gaming characters, studying and planning strategies, as well as spending time with a community of like-minded individuals. Mobile phones are synonymous with community and collaboration. Therefore, when gamers play on their primary communications device – the mobile phone – they expect a higher degree of community than conventional networked gaming devices, such as PCs and gaming consoles.

Mobile online gaming fulfills user expectations on real-time collaborative, social gaming experiences. As the next step in multiplayer gaming, mobile online gaming allows players to form gaming teams or join already existing groups to play and share game related experiences. Collaborative mobile gaming that blends content and communications to enable socially engaging services, such as enriching the interaction of a user with their social group and expanding the user's social circle through shared experiences, fits into the connected lifestyles of consumers and promises a more fulfilling gaming experience than single-player games. At the same time, a successful game platform with a built-in user



base has a strong viral effect – it can cross-promote new games, engaging the community in the very evolution of the game or virtual world. With a successful game requiring thousands of participants, and significant time invested by many of those users, any platform that can build such loyalty has a huge competitive advantage.

Some basic versions of gaming communities such as Pac-Man and Botfighters already exist. These games use SMS as the primary means for players' communication, as well as using GPS tracking capability of mobile phones to locate competitors in the proximity. Mobile online gameplay will leverage from the growing presence of advanced data networks and deliver enhanced social experience to the already existing forms of multiplayer community-based gaming. Mobile Internet connectivity promises mobile gamers the ability to play games in genres that require real-time interactivity between players, including racing and first person shooter games.

3.2.2. Economized Gameplay

Currently, one-time payment for the game's complete ownership is the dominant pricing model in the mobile gaming industry. However, the high price of mobile games available to consumers for download has prevented a large section of mobile consumers from purchasing mobile games. It is crucial for telecom service providers to align pricing models with consumers' value perceptions to drive mobile games uptake among a wider audience. Mobile online gaming allows operators to introduce a number of flexible micro pricing options, driving greater value for a wider market demographic. These pricing plans do not burden consumers to control spends within budgetary outlays. At the same time, the value proposition consumers derive out of these "sachet" pricing models helps operators to effectively promote gaming services to new users, as well as drive usage among existing customers. Operators can use a combination of the following pricing options for mobile online games to help users derive greater value on their money spent.

Session-Based Play

Users can opt for a session-based pricing plan offered by their mobile games operator and pay per session of mobile gaming. This is an effective way to promote games to mobile casual gamers who play for short intervals, mainly in between activities.

Pay-Per-Play

'Per-Play' can be defined in a number of ways, including time-defined play and usage-based play.

Time Defined Play: Under the time-defined pricing plan offered by operators, mobile users will get to play the game for a certain period (maybe a few minutes, or a couple of hours), irrespective of the number of sessions they play within the stipulated time. The pricing will be based on the amount of time spent online while playing. The target segments for the time-defined plan are those users who are new to mobile gaming, and are largely unaware of the game's rules and methods of play. For this segment, defining the time they have access to the game will enable them to grasp the intricacies of playing the game without worrying about session termination.

Usage-based Play: The usage-based play pricing plan aims to target users who do not want to pay a lump-sum for downloading the game, but still wish to play continuously without restrictions on time or the number of sessions. In addition to a set fee for access to the game, users are charged on the basis of the volume of data they transfer across the network while playing. This option should be appealing to mobile multiplayer gamers as time and session restrictions do not abruptly end their play-time.

Subscription-based Pricing

A subscription-based pricing plan allows users to subscribe to a game (or a pack of games) available on the operator's portal for a limited number of days. Subscription packs may or may not limit the volume of data consumed while playing the game during the subscribed period.

Bundled Pricing

Telecom operators can offer mobile online games as a bundled offering along with consumers' mobile Internet subscriptions. For example, bundling online play of particular games for a fixed duration along with a monthly mobile Internet subscription at an affordable price point will not only generate greater value for consumers, but it will also help operators drive usage of their mobile gaming services.

3.2.3. Diversity of Game Choice

The availability of a wide variety of game titles over a convenient, easy-to access interface is the key to attracting first-time mobile gamers as well as satisfying the diverse gaming needs of the regular mobile gaming audience. According to the *Fall 2008 Ad-ology Media Influence on Consumer Choice* survey, product availability was rated as an important factor in the video game purchasing decision by 83.8% of buyers. Mobile online games enable operators to showcase a large catalogue of games online to consumers, providing them with a choice of popular new and classic games across a wide variety of genres, developers, and publishers. Users can make their selection by browsing game titles or learn more about games through screen shots, user reviews, or game demos. Moreover, users can access these game titles from any suitable device and experience games that might have been incompatible in a 'download-to-device' scenario. Overall, the choice available to consumers, when combined with convenience of access and control over usage ensures a 360 degree interactive gaming experience to the Internet-connected mobile user.

3.3. Cost Structure

The costs incurred by a business model directly impact its profitability. Ideally the costs associated with every other business model constituent should be measurable and traceable, so as to study their impact on overall profitability. However, it is often difficult to trace the impact of each cost factor to the final performance of the business model. Still, it is critical to broadly understand and evaluate the most essential costs incurred, and devise ways of reducing the overall cost structure for the success of any business model.

From a technological perspective, the mobile gaming market is very heterogeneous. Unlike the console and PC gaming space where a handful of platforms exist, the mobile gaming space is marked by numerous devices, platforms, and operating systems, each with unique characteristics and specifications. The plethora of non-standard mobile devices and operating systems in existence today is one of the major challenges as well as a significant cost component for mobile games development. To make their games available to a large consumer-base, mobile game developers need to create several hundred versions of the same game and port it to these unique environments. In effect, this also limits the game's performance since they are never optimized to fully take advantage of the hardware available. Besides the lack of optimized gameplay, porting across a plethora of game environments and devices increases the overall cost of game development manifold. NASSCOM estimates the cost of porting games on different devices on average ranges between USD500-USD1600 per port. These costs directly impact the profitability of multi-platform game development. For example, if a game publisher has 20 games in its portfolio and wants these available in 5 languages, compatible with 50 top mobile devices, it will have to create (20*5*50) builds. The total cost estimation at an average rate of USD1000 per build equals USD5 million.

In contrast, as mobile online games are hosted over the operator's network and not stored on the mobile device, as is the case with downloadable games, they will have little relation to platform, device and



operating system fragmentation. Mobile games available for play online will substantially reduce porting costs for mobile game developers, resulting in improved performance and greater revenues for mobile gaming stakeholders.

3.4. Delivery Mechanism

The mode of distribution and delivery represent the channels through which businesses communicate with their customers and offer their value propositions to the target segment. These channels are the interface between a company, its value propositions and its customers. A good and integrated channel design can be a powerful tool for differentiation and competitive advantage.

Currently, mobile games are distributed in one of the following ways:

- Over the Air (OTA) A game binary file (typically BREW or JAVA) is downloaded to the mobile device via wireless carrier networks.
- Sideloaded A game file is loaded onto the phone while connected to a PC, either via USB cable or Bluetooth.
- Pre-installed A game binary file is preloaded onto the device by the Original Equipment Manufacturer (OEM).
- Mobile browser download A game file (typically Adobe Flash Lite) is downloaded directly from a mobile website.

Games Hosted Over the Cloud

The Internet continues to transform the global business environment, unfolding substantial opportunities to create entirely new Internet-based business models. A cloud service is a product or service accessed and consumed in real-time over the Internet. In the context of mobile gaming, cloud gaming would allow operators to host games online, i.e. over the network/cloud, rather than make users save them locally on their handsets. Operators would stream those games in real-time over wireless data networks whenever users request a play. The proposed mobile online gaming model is a client-server based gaming technology, where games would be stored and managed remotely on servers hosted in the operator's network. Users will need to download the client just once to play any game hosted on the operator's deck online.

The primary consumer benefits of cloud-based mobile gaming services include the ability to play games irrespective of mobile device memory limitations, instantaneous gameplay without the need to download huge data files, and the power to connect with other gamers through virtual communities over the Internet. Users are also insulated against attacks from viruses, since the gaming applications are hosted on servers that protect themselves from virus attacks. Although handset functionalities would still play a nominal role in gameplay, mobile online gaming would overcome device limitations to a very large extent.

Second Life – An Example of 'Gaming as a Service³

Second Life is an example of a utility service supplied over the Internet and shared simultaneously by many people. It is very different from traditional computer games, which need to be installed separately on each player's hard drive. Second Life is also itself a construction of many other utility services. The "computer" that runs Second Life doesn't exist in any one place - it is assembled, on the fly, from various data-storage and data processing molecules floating around in the global computing cloud. The program constantly "talks" over the Internet, with the main software Linden Lab uses to generate its online world. That software runs on hundreds of server computers that are housed in two data centers, one in San Francisco and one in Dallas, owned not by Linden Lab but by utility hosting companies. Every server computer contains, in turn, four virtual computers, each of which controls a 16acre plot of land in Second Life. All the real and virtual computers work in tandem to create the vast world that residents experience as they play the game.

Source: "The Big Switch: Rewiring the World, from Edison to Google", Nicholas Carr



3.5. Revenue Streams

A business model's sustainability depends on the revenues it can capture from its value creating and customer facing activities. Revenues come from one or several client segments, as well as other parties who are willing to pay for the value they get from the offering. The source of these revenue streams differ across industries depending upon the nature of business and the target customer segments. Traditionally, customer game purchase has been the primary source of revenue in the mobile gaming business. In recent years, a number of operators have explored advertising as another revenue stream to supplement their traditional income source. As new models such as mobile online gaming evolve, they promise a more diversified revenue source for operators from their gaming business. The mobile online gaming model, for instance, allows telecom operators to explore game advertising in richer and more innovative ways than what is possible in the download model. Continuous mobile internet connectivity during gameplay also unfolds opportunities to extend existing fixed online gaming monetization models such as real-money transaction in to the mobile realm.



The additional sources of revenues operators can tap through mobile online gaming are discussed in this section.

3.5.1. Advertising

The engagement, interactivity, and immersion generated by mobile games are highly attractive to advertisers who are on a continuous look-out for more effective channels to promote their brand offerings. Mobile gaming applications provide advertisers with an environment that is conducive to placing advertisements, either as banners visible during gameplay or as adverts shown in between levels or rounds. In addition, games also present a unique advertising opportunity in the form of in-game advertising, where adverts are embedded within the game content. A potential scenario is the placement of an in-game energy drink at different stages of the game. The player's character consumes the energy drink and regains the energy necessary to continue with the game. The most obvious benefit brands derive out of in-game advertising is their ability to reach targeted consumers without disrupting attention and user-experience, primarily because embedded adverts do not compete for screen space with the actual content. Research from the University of Wisconsin indicates brand placement and advertising within digital games is highly effective - achieving recall scores of 30% in the short term, and 15% after 5 months. Consequently, the revenue potential for in-game advertising is high. Informa estimates the global in-game advertising revenues will grow from USD21.3 million in 2008 to a substantial USD690.6 million by 2013. In addition to the advertising formats currently used in downloadable games, mobile



online gaming unfolds a number of new opportunities for brand advertising including dynamic advertising and adverts targeted on mobile gaming communities.

Dynamic Advertising

Static advertising is a fixed ad placement in the game at launch and stays in the same form after release of the game indefinitely. This type of advertising does not rely on an Internet connection to broadcast the images into the game and cannot be changed after the game is released. An online mobile gaming model enables operators to introduce targeted advertisements to gamers, pushing ads dynamically, based on the user's gaming usage patterns and interests. Dynamic advertising is a branding image which can be changed at intervals. The dynamic method of ad-insertion provides advertisers an easier way to measure and collect valuable advertising data on consumers, and potentially even consumer behavior, based on impressions, keywords, click-throughs, and other measurement metrics. Moreover, it is easier to correct potential issues for both parties (the advertiser and the game developer) in a dynamic placement. For example, if there is a problem in a fixed placement with a branded image, or with any claims or other copy in the advertising, a game recall may be the only solution to the advertiser – and the game company will likely resist it as much as possible. On the contrary, in a dynamic advertising placement, images and their position can be easily modified and changed as and when required. Dynamic advertising spots are also typically less expensive than static placements, and offer a greater return on investment for advertisers.

Advertising in Virtual Gaming Communities

is an inherent Interaction component of community. With advertisers increasingly seeking more interactive media to reach and engage consumers, virtual gaming communities promise a compelling destination for brand Community-based advertising. games require a virtual 'lobby' where players can meet online before joining a game. These lobbies provide a congenial space to draw players' attention through targeted advertisements. In addition,



advertisers can explore a number of game-related online community spaces, such as gaming blogs, social discussions forums, and communities of interest formed by players for mobile online multi-player games. Interactive advertisements placed at these social corners have the potential to tap the mindshare of the gaming community even after the game is turned off. Moreover, the strong viral nature of these user-created communities enables rapid dissemination of favorable brand impressions.

3.5.2. Real Money Transactions (RMT)

Several players in the online and mobile industry have introduced real money trade within virtual environments, such as IM communities and online gaming environments. Within RMT enabled online games, items and characters in the game are not only by-products of gaming but also objects of monetary exchange in real currencies. The successful, massively multiplayer online game, EVE, has a detailed market economy with contracts, commodities trading, and player-run corporations with ownership shares and IPOs. Likewise, one of the first successful virtual economies, Second Life, has a huge marketplace, which includes objects and services for sale, as well as a real estate market.



According to estimates, in 2008 more than USD100 million worth of Linden dollars (the virtual currency of Second Life) were bought and sold on Second Life's official LindeX exchange.

As with online games, RMT within mobile games can emerge as an important source of revenue for the mobile gaming industry. Developers can target gamers with varying levels of commitment and budget when using in-game purchases: core gamers will commit more time and money to the game, purchasing many in-game items, while more casual players may have lower budgets and time commitments. However, RMT is a unique phenomenon that can only take place in mobile Internet connected environments, as the debit and credit of money from users' banking accounts requires a robust financial eco-system with real-time connectivity. RMT is less likely in downloaded games as most of these games are played in an offline mode.

3.6. Customer Delight

A highly competitive market economy, the availability of multiple product choices, and shrinking consumer attention span has transformed the contemporary business landscape. This new environment has placed the customer at the center of the business canvas. Business designs have evolved accordingly. While yesteryear's businesses focused primarily on their product and service offerings, and on the efficiency and effectiveness of their operational models, contemporary businesses maintain a more structured and comprehensive view of their customers. At the same time, today's customers are more informed and sophisticated, and are satisfied with nothing less than the highest quality of service experience. Therefore, to retain customers it is critical for companies not only to meet customer expectations but also to deliver extra value that leads to greater customer delight. Getting relationship management right in a business model is crucial today to satisfy and exceed customer expectations. Consequently, successful businesses are those that employ a customer-centric approach to identify and adapt to changing customer priorities and construct their business models to match them.

Although the prevalent downloads model in the mobile gaming business has succeeded in delivering a set of basic value-proposition to mobile gamers, it has missed opportunities to create a sense of consumer delight. The ability to personalize and deliver tailored services to consumers is an important area operators can explore through the mobile online gaming model to deliver enhanced customer experiences.

Personalized and tailored service delivery is an important element to delight customers with superior, hassle-free experiences, which win customer loyalty through deeper customer relationships. For operators, the access to real-time data enables the collection analysis of users' gaming behavior – leading to improvements in gaming strategies. For example, operators can provide subscribers with a convenient, personalized "my games" page which displays user preferences, acts as an interface to connect with friends, updates consumers of new game additions, and tracks their current rental and subscription packages. Moreover, one of the fundamental

Personalization Framework							
Home	Profile	Friends					
Most Played	Recently Played	Preferred Genres					
My Plan	Demos	Read Reviews					
Source: Comviva							

improvements brought by personalization technology is the ability to provide various push-based applications in which the network autonomously determines whether to push services toward the user. Services may include game content, information, and notification of events. For example, personalization will enable operators to deliver advanced, customized services such as alerts, targeted advertising and promote targeted games to consumers.



4 Conclusion

Mobile games have evolved from a bundled freebie to a stand-alone value-added service, and emerged as a growing source of data revenue for mobile operators. As handsets continue to represent the convergence point of personal communication and entertainment, the future is bright for mobile games. However, several fundamental barriers have to be overcome before mobile phones can offer a ubiquitous mobile gaming experience to consumers. The difficulty consumers encounter finding, purchasing and downloading mobile games are the most pressing challenges currently faced by the mobile gaming industry. New and innovative business models, such as mobile online games, that take advantage of faster cellular networks and Internet-based delivery mechanisms will enable operators to overcome a majority of issues faced by the prevalent downloads model, thereby expand the mobile gaming market to untapped consumer segments. Greater inclusion coupled with enriching mobile gaming experiences is an imperative to realize the true potential of mobile gaming.

About Comviva

Comviva adds value to the mobile service provider's business and operational environment, creating subscriber stickiness via innovative products, applications and service offerings that cater to every aspect of the subscriber wish list, whilst addressing critical operational issues confronting the mobile service provider today.

With an extensive portfolio of solutions that drives content, commerce and community-focused services and revenues for operators, Comviva enables mobile users to interact and access infotainment easily.

Operator goals of improving performance and enhancing the user service experience are supported with solutions that enable rapid and profitable service extension to new and existing subscriber segments, whilst enabling end-to-end service and customer lifecycle management.

A global leader, Comviva's solutions power value added services for operator customers in over 80 countries worldwide.

Comviva's registered office is in New Delhi and primary development centre is in Gurgaon. Its other R&D centers are located in Bangalore and Mumbai. Comviva has representative offices in UAE, UK, South Africa and Singapore.

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