The Business and Dynamics of Free-To-Play Social-Casual Game Apps

by

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Submitted to the System Design and Management Program
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Abstract

The rapid growth of social media platforms, specifically Facebook, has caused startup firms to develop new business models based on social technologies. By leveraging the Facebook platform, new entertainment companies making free-to-play social-casual games have created a multi-billion dollar market for virtual goods, a revenue model in which the core product is given away for free and ancillary goods are sold on top of it. Zynga, the most successful firm in this space, held the largest initial public offering for an Internet-based company since Google in 2004. However, concerns about Zynga's longevity (as well as the longevity of other social-oriented firms, including Groupon) persist for a variety of reasons, including the novelty of its business model, the dependence on hit products with short lifecycles, and the stress placed on internal development teams.

This thesis analyzes some of the key problems faced by Zynga and its competitors, including how to monetize free products, how to maintain a user base over time (using platform strategy concepts), and how to develop short and long-term product management and new product development policies (using System Dynamics). An additional chapter develops principles for launching social platforms and products by comparing and contrasting key factors that influenced the growth of five major social media websites. The principles are then discussed as they pertain to Zynga and social-casual gaming, in which case there are notable applications and key exceptions based on Zynga's circumstances. The thesis concludes by discussing several future areas of research that pertain to the socialization of products and technology.

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While much of my research in the social-casual gaming market has depended on online sources, I have been able to confirm much of what I have found and add more depth to my understanding through meetings with Fareed Behmaram-Mosavat at Zynga Boston. He has been a valuable resource in the development of this thesis and I have greatly appreciated his insights.

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Chapter 1: Introduction

Free-to-play social-casual gaming has been a rapidly growing subset of the video game industry in the United States since 2007. These types of games are most widely known and played through their integration with Facebook, which has emerged as the dominant online social networking platform with over 800 million active users. This thesis is in many respects a case study of Zynga, the most successful company in social-casual games to date, which has leveraged Facebook to attract well over 150 million (unique) users of its own. Zynga recently held an initial public offering on Dec. 16, 2011, carrying a valuation of nearly $7 billion [1]. It is potentially "the largest United States-based Internet offering since Google in 2004," which may come as a surprise since Zynga's products are available for free [2]. Zynga is part of a new wave of web companies that leverage social media as part of their business model. The new wave includes Groupon, which went public earlier this year and raised $700 million [3]. However, many of these new firms have seen their stocks fall below IPO prices as skeptics have wondered how realistic their prospects are and whether they have long-term viability [4]. This thesis discusses key aspects of this problem, which are detailed in the following section of this introductory chapter.

Problem statements and thesis structure

The main content for this thesis is divided into four chapters that explore and analyze both Zynga and the market for free-to-play social-casual games. Since Zynga and its competitors allow users to play their games for free, Chapter 2 discusses *how to make money with a free product*. Although there are several possible revenue models in this field, the unique concept of virtual goods has emerged as the most profitable. The latter half of the chapter includes a comparison of Zynga's financial statements to other software products firms in order to gauge key similarities and differences, and I end the chapter by making recommendations for companies that use similar free-to-play business models.

A second problem associated with games is that they have relatively short lifecycles, which causes user decay and puts pressure on new product development. Chapter 3 uses platform strategy concepts to analyze *how to maintain a firm's user base over time*. For instance, Zynga uses its portfolio of games to increase network effects that help maintain the user base over more than just one product. Zynga is also developing Project Z, a niche social network that has the potential to reduce churn rates and ease stress on product development. Additional platform-related topics that are analyzed include platform ecosystems, winner-take-all markets, hybrid products/services, and product stickiness.

However, the market for social-casual games is so new that managers at Zynga are not yet sure what the lifecycle of their most successful products will be. This creates a problem for *how to plan future product management and product development when there is no precedent set for the lifecycle of the product*. To respond to this issue, I have developed a System Dynamics model and simulated the active user levels for one of Zynga's biggest hits in order to understand what the key variables are and how they affect outcomes. Chapter 4 shows how this model was constructed and tests how changes to the duration of an active user affect overall activity levels, while also accounting for different forecasts of the underlying growth of Facebook.

Finally, since social media is still a new phenomenon, Chapter 5 considers *what principles should be used in the design, development and release of a social product or platform*. The principles are developed through a comparison of the early growth periods of five major social media sites (YouTube, Facebook, Twitter, Blogger and Wikipedia). The principles are then discussed as they pertain to Zynga and social-casual gaming, in which case there are notable applications and key exceptions based on Zynga's circumstances. Before moving onto these next chapters, however, it is necessary to define what is meant by a 'free-to-play social casual game.'

Defining free-to-play social-casual games

The term 'free-to-play' simply refers to games that users can play without necessarily paying any money. While free trials and free demos have existed for many years in the gaming market, a free-to-play product differs by allowing the user to achieve the game's primary goals without ever having to buy anything. This does not mean that users never pay, but simply that they are not required to pay.

Social games have an emphasis on interacting with other people. This includes a range of game designs from those that merely provide asynchronous information (e.g., statistics) about a user's progress to their friends, to those that require real time interactions as the basis of play. Social games have existed for as long as there have been games. In fact, *Pong*, which effectively started the video game industry in 1972, supported two players and was available in social hangouts, such as bars and arcades where friends could easily play it [5, p. 23]. Incorporating a social element to video games has been so important to success that nearly every video game system, from the Atari to Sony's Playstation 3, has featured support for multiple players. The Internet, however, removed the need for players to be sitting together in the same physical location and has also allowed the ability to interact with far more people than was previously feasible. Certain online games have gained a cult-type following, including *Counter-Strike*, in which social "clans" form the basis for competitive gaming, and *World of Warcraft*, in which social "guilds" allow many users to undertake goals (called "quests") together. Facebook and other social networks have only made it easier to share information with friends and family, providing a social platform that many new games are integrating.

Casual games are described as "easy-to-play, short-session games" in which the "players generally want to drop into and out ... quickly" [6, p. 10]. They require relatively little time spent per session (often under five minutes) and have an easy learning curve. So-called hardcore games are on the opposite end of the spectrum, requiring longer periods of invested time with steeper learning curves. While casual games have existed for many years, the concept of a distinguishable casual gaming market has only recently emerged. The success of the Nintendo Wii and the growth of mobile devices are largely responsible for popularizing the notion of casual gaming and segmenting the market between casual users and hardcore users. While most video game consoles feature elaborate hardcore games, Nintendo has concentrated on casual game design, most notably with *Wii Sports*, which has simple and intuitive motion controls and short session mini-games. Many casual console games, including *Wii Sports*, are also social games because they incorporate multi-player capability, but console games have not been available as free-to-play because the console-makers generally rely on license fees and royalties from third-party game sales. Meanwhile, the proliferation of smartphones (most notably Apple's iPhone) has also caused growth in the market for casual games, perhaps the most successful

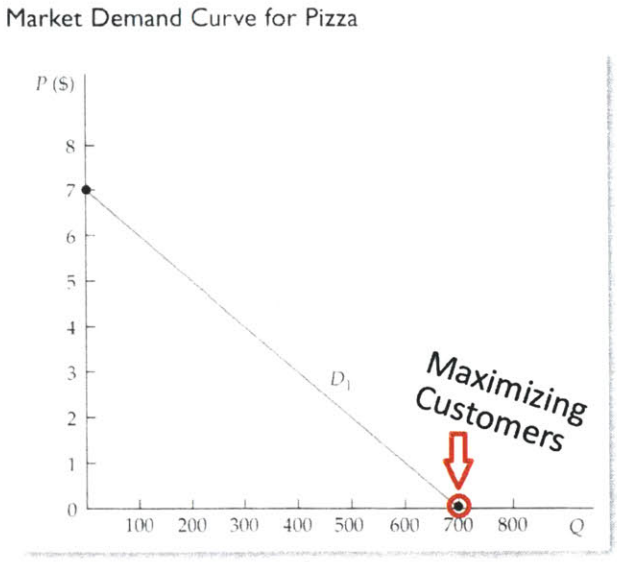
example being *Angry Birds.* Like *Wii Sports*, the design of *Angry Birds* can be characterized by a minimal user interface with only a few types of inputs, and while it includes a complex and realistic use of physics, the user's goals are simple and intuitive. The game can be learned in seconds, and a session can be completed in under a minute. However, *Angry Birds* has no social interaction components and currently costs the user 99 cents on the Apple App Store (a common price), which is cheap, but it is not free-to-play.

A free-to-play social casual game combines these distinct features by integrating social interactions with an easy to learn game that can be played in short sessions and is available to play at no cost to the user. The majority of these games are implemented in Flash (with a trend towards HTML5) and played as a browser-based app through Facebook's website, although mobile app versions are increasingly common for smartphones and tablet devices. Zynga's *FarmVille* is perhaps the most well-known of these games, having reached a high of 83 million monthly average users (MAUs) in early 2010 and causing investors to take a serious look at the market. For these reasons, I have used *FarmVille's* active user data over the past two years as the basis for the System Dynamics simulations in Chapter 4. It should also be noted that in future chapters, references to 'social-casual games' generally imply that they are free-to-play and are simply trying to reduce the cumbersome repetition of the full name.

Chapter 2: Making money with free-to-play games

Why would a business give its core product(s) away for free? Even considering the ways to make money with a free product, why take the risk of making no money at all? In the case of social-casual games, the answer appears to lie in traditional economic theory. Take for example Figure 1 below, which shows a hypothetical demand curve for pizza [7, p. 47]. If pizzas are offered for zero dollars then the quantity demanded is maximized to 700 pizzas. Obviously 700 times zero dollars will not incur any revenues, but the pizza maker will be serving all of its potential customers, thereby allowing two things to happen: word of mouth will spread faster reducing the need for advertising expenses, and the pizza maker will make more money selling ancillary goods and services (e.g., pizza toppings).

Figure 1: Maximizing the number of customers on a market demand curve



Adapted from: Keat, *Managerial Economics*

This type of business model, often called a freemium model, removes price elasticity effects such that if anyone wants the product there is almost no barrier to adoption (except perhaps scarcity if it is a physical good, and the need for expensive complementary products, such as a computer). The term freemium comes from the combination of free and premium, meaning that the core product is offered for free, but premium add-ons and services may be sold on top of it. However, freemium should not be used interchangeably with free-to-play because a free-to-play product may be able to make money through other methods as well, which will be shown in this chapter.

In addition to maximizing customers on a demand curve, there is the possibility that reducing the price to zero will result in even more customers than the curve's linear relationship suggests. Ariely demonstrated this with a simple experiment in which students were asked to choose between buying a Hershey Kiss for one cent or a Lindt truffle for 15 cents. In this scenario, the students overwhelmingly chose the higher quality truffle. However, when Ariely decreased the price of both chocolates by a penny, so that the Hershey's price was now "FREE!" and truffle was 14 cents, the students overwhelmingly favored the Hershey's Kiss and the truffle's share plunged [8, p. 52]. As a result,

reducing a product's price to zero can give it tremendous advantages over its competitors. The severe drop-off in truffles also suggests that when competitors are offering their product for free it will be difficult for a firm to capture market share with a price above zero.

Still, most managers would probably scoff at the idea of giving their products to consumers for free, but it can be a successful strategy and is not a novel idea. For instance, broadcast television stations have been freely airing their programming since the 1940s, and radio broadcasts and some newspaper publications have been free for years. More recently, as the Internet has created new sales channels and new types of industries, a larger variety of companies have been able to adopt similar models. The purpose of this chapter is to investigate how companies with free products actually make money, which includes an examination of revenue models and publically available financial records. The key factors that are enabling the success of free products are also identified. From this analysis, strategic insights have been developed for how free-to-play products should be designed and managed.

How free-to-play companies make money

There are currently a handful of proven ways for free products to earn revenues: advertising, premium subscriptions and fees, bundling, contractual relationships with complementary businesses, and most recently, virtual goods paid by micro-transactions (some companies, such as Red Hat, earn revenues by providing professional services for free products, but since game developers have few opportunities in this sector it has been omitted from this analysis). These methods are not mutually exclusive and many of today's social-casual games earn revenues by utilizing two or more of them. They also have an inherent element of a platform strategy because the free product acts as a platform through which to perform other sales. The following paragraphs explore these methods in more detail.

Advertising

Advertising is perhaps the most commonly observed method for earning revenues on free products. Case in point, the NFL Superbowl, which is broadcast every year for free, commands millions of dollars for every 30-second commercial that interrupts the action. On the Internet, however, advertising only becomes profitable when ads are asynchronously displayed many thousands of times. Google has a particularly lucrative position because it is the first point of search when someone is interested in a product. This allows the company to customize sponsored ads and text ads to every search term or phrase. On the other hand, the social network Facebook, which is rarely used for product searches, has click-through rates that are only $1/50^{th}$ as successful as Google [9] [10]. The sheer amount of time users spend on Facebook, however, makes this fraction viable because so many pages and ads are loaded and viewed. A representative from the biggest social-casual game developer, Zynga, suggested to me that display advertising in social-casual games is even less effective than Facebook, presumably because their users are more intensely distracted by the game content. Furthermore, it is harder for a game developer to rely on advertising revenues alone because each game only captures a fraction of Facebook's 800 million user base over a shorter period of time.

Premium Subscriptions and Fees

Many newspapers currently provide their daily editions on the Internet for free, but often charge subscription fees for access to archived content. The idea here is that the product is free, but

only to an extent (free but not free). The game *World of Warcraft*, which has long required monthly subscriptions to even play the game, recently changed to a similar model. Now a user can play the game as long as they want, with the exception that their characters can only reach a certain level of experience [11]. The advantage of this method is that it can attract a larger user base (a plus for potential advertising revenues), while still charging consumers that become more engaged with the product over time.

Subscriptions do not appear to be common in most social-casual games; however, many mobile app games offer premium versions that either have better functionality or are more aesthetically pleasing (often by eliminating advertising seen in the free versions). These apps generally require one-time payments of a typically low sum (a few dollars or less). Zynga's *Words With Friends*, for instance, has two apps currently available in Apple's App Store: a free ad-supported version and a $1.99 version that simply removes any ads. The number of people who pay for premium features, however, is generally a small fraction of the total user base.

Bundles and Tied Subsidies

Bundling and tying are methods in which free products can increase the value of an underlying platform or complementary product. Parker and Van Allstyne define bundling as offering "an entire collection of goods for a flat fee or subscription price" instead of selling each good individually [12]. This definition implies that each good accounts for a share of the overall price, but this chapter will refer to the scenario that one of the bundled products is ostensibly sold as free (even though you have to buy the bundle to get it) .The products contained in a given bundle do not necessarily complement each other, although it is rare that they have no connection whatsoever. Tied products, on the other hand, are bundles in which the products are "indispensable complements" [13, pp. 28-29]. Razors and razor blades are often used as an example to explain this interdependence since one cannot be used without the other.

In many cases, gaming products have been offered for free as part of a bundle in order to increase the value of an underlying product or platform. Having reached more than 400 million users, *Windows Solitaire* has been described as "the most played casual game ever," with the caveat that "Microsoft didn't directly profit — the game is simply a long-running perk for owners of Windows computers" [14]. *Solitaire* has been pre-installed on every version of Windows since 3.0, and according to a Microsoft Program Manager, *Solitaire* is "the most used application" available on their operating systems [15]. While few people would buy Windows for *Solitaire*, it is clear that the game has increased the value of the Windows platform by keeping Windows users active. However, it is notable that the social aspect of Facebook games, in which users "nudge friends to play and become virtual neighbors ... gives Facebook an advantage Windows lacked," particularly since *Solitaire* is by definition anti-social [16].

The web portal Yahoo! bundles a large variety of free content services with its Internet search platform, including a variety of the first free-to-play social-casual games available online. The games themselves were not directly monetized (nor are the majority of Yahoo's other services) since the main intent has been to keep users on Yahoo's pages, from which it earns advertising revenues. In 2009,

Yahoo! Games had nearly 20 million monthly users and had been the biggest online games operator in the US for several years before Zynga surpassed them (Zynga now has up to ten times as many users as Yahoo! Games) [17].

The primary example of tying in gaming is when a video game is packaged for free with a console platform (e.g., the Nintendo Wii always ships with *Wii Sports*). These goods are strongly tied because the game is useless without the console and the console is useless without any games, so selling them together will increase adoption. Aside from consoles, however, there are not many good examples of tying in gaming, possibly because the other types of platforms used by games (e.g., Windows, Facebook, Flash, web browsers, smartphones, etc.) have a multitude of other uses.

For game developers, it seems that the major caveat of this revenue model is that they must also control the underlying platform in order to directly benefit from bundling or tying. It is possible that a free product could be bundled with another firm's platform, but the developer will need either an indirect share of the sales via a contractual arrangement or a different source of revenue altogether. One could consider that Zynga's games are part of a bundle of services offered by Facebook, but Zynga does not earn revenues from Facebook's platform.

Virtual Goods Paid By Micro-Transactions

Wikipedia describes virtual goods as "non-physical objects purchased for use in online communities or online games. They have no intrinsic value and are intangible by definition" [18]. A co-producer of the 2007 Virtual Games Summit further argued that "virtual objects aren't really objects – they're services ... they are graphical metaphors for packaging up behaviors that people are already engaging in" [19]. She used the example of users on the *Hot or Not* attractiveness rating site "paying $10 to send the object of their affection a virtual flower." Essentially, virtual goods can be representations of physical objects (real or imaginary), but they can also represent ideas and emotions for which people will pay real money.

In gaming, the virtual goods market is larger than advertising and growing more quickly. While estimates of its size vary, most analysts suggest it is over $1 billion in the US and will have at least doubled from 2009-2012. In Figure 2, below, eMarketer suggests that virtual goods will be approaching $10 billion by 2014, about $7 billion higher than advertising [20, pp. 3-5].[1] As a result of these figures, virtual goods have become the driver for most of the profits and growth in social-casual games.

[1] Note that the virtual goods forecasts include revenues from "lead-generation offers," which are a minor subset of the virtual goods market.

Figure 2: Forecast of virtual goods revenues through 2014

Social Gaming Revenues Worldwide, by Segment, 2009-2014
millions

	2009	2010	2011	2012	2013	2014
Virtual goods*	$1,493	$2,988	$4,907	$6,707	$8,116	$9,539
Advertising	$263	$672	$1,199	$1,718	$2,098	$2,532
Total	**$1,756**	**$3,659**	**$6,107**	**$8,425**	**$10,213**	**$12,071**

*Note: social gaming includes games on social network sites and mobile social network platforms; *includes indirect payments from users (i.e., users earning virtual currency by taking online surveys or opting into lead-generation offers from marketers such as Netflix and Blockbuster, etc.)*
Source: ThinkEquity LLC, provided to eMarketer, Dec 22, 2010
123467 www.eMarketer.com

The pricing of virtual goods is typically very low, but there are some cases where virtual goods have been sold for surprisingly high figures. For instance, in *Second Life*, a virtual space station was sold for a record setting $635,000 [21]. Meanwhile, *World of Warcraft* has seen users in the UK selling their personal accounts (consisting of their characters, experience levels and other virtual items) for up to 7,000 euros [22]. While these figures are impressive (and perhaps shocking), the virtual goods sold in social-casual games are often mere pennies.

Many of Zynga's games, such as *FarmVille* and other "Ville" titles, offer virtual goods such as crop seeds and farm animals, which generally range from a few cents to a few dollars. These purchases are called micro-transactions, and they are made possible by converting deposits of cash into a virtual currency. As of this writing, $4.99 will buy either 7500 coins or $25 worth of Farm Cash in *FarmVille*. The coins are generally used for ultra-cheap core elements of the gameplay (e.g., raspberry seeds cost 20 coins or 1.33 cents). The Farm Cash is typically used for bigger ticket items (most between one to ten dollars). Virtual goods also act as an umbrella term to cover purchases that enable users to play longer (via "virtual 'energy boost' goods such as batteries in *CityVille* and food in *FrontierVille*") and that accelerate a user's game progress (via "'power ups' to increase their capabilities") [23, p. 84].

The problem is that only 1-3% of players currently pay for virtual goods, while the other 97+% never pay at all [24]. The CEO of Playdom, one of Zynga's primary competitors, indicates that for a typical Facebook game to be considered successful its small percentage of paying users must contribute $20 per month for 3-6 months [25]. As a result, revenues from virtual goods only become significant with a large number of users who play over a long enough period of time.

As eMarketer also suggested in Figure 2, social-casual games earn additional revenue from "indirect payments from users ... taking online surveys or opting into lead generation offers." Game developers receive payments from the companies requesting surveys and lead generation, while users receive free amounts of virtual currency for participating in them. While this is conceptually similar to advertising, it would not be successful without the users' desire to buy virtual goods. As a result, these indirect revenues are more properly considered part of the virtual goods business. However, a Zynga rep informed me that the revenues they receive from both advertising and lead generation are only a small

fraction of their business, with up to 90% of revenues coming from direct payments for virtual goods (even higher than eMarketer's projection).

In fact, Zynga has shied away from advertising as its sales of virtual goods have rapidly grown. Table 1 shows that advertising originally accounted for the majority of their revenue, but was quickly eclipsed after 2008. Further, advertising revenue grew to roughly $36 million in 2009, but then fell to $23 million the following year even though Zynga had amassed over 200 million monthly average users. They intentionally decreased their reliance on advertising because of concerns regarding how ads affect the game experience.

Table 1: Zynga's revenue by type

Percent of Revenue by Type [23]	2008	2009	2010	Six months ended Jun 30. 2011
Virtual Goods	27%	71%	96%	95%
Advertising	73%	29%	4%	5%

The Zynga representative I interviewed informed me that they have decreased the use of advertising in their games because it degrades the user experience, causing a decrease in adoption and average customer lifetime, which in turn hurts their virtual goods business. In some games this does not really matter because the ads do not interrupt the natural flow of gameplay. For instance, *Words with Friends* displays an ad following each user's action because they have an inherent rest period while waiting for their opponent to make a move. However, most of Zynga's games do not have an inherent rest period in which this can be done, so forcing an ad into the game will have a more damaging effect on the user experience. Advertising and virtual goods may not be mutually exclusive, but only given the right circumstances can they work together. This problem points out a dichotomy between the two revenue models, and while a firm can choose to implement both types with a mix of products, it should be clear in the product design and development phase which type they are implementing and how.

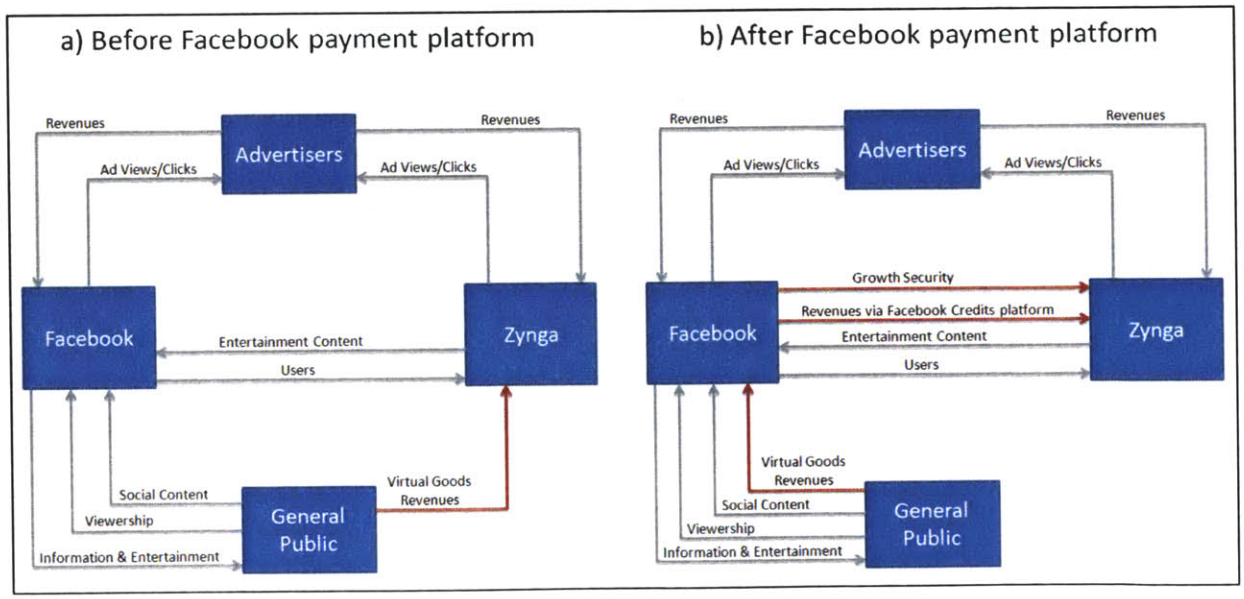
Virtual goods also create a unique design challenge in games that are otherwise free. For a traditional store-bought game, the developer only needs to make the game appear entertaining enough for a customer to justify paying for it. However, for a game that sells virtual goods, the developer first needs to make the game fun enough for users to start playing, and then needs to make the game feel like it will be even more fun if they pay for it. This creates two layers of entertainment value that a person may encounter: the free experience and the paid experience. In order to attract the maximum number of users possible, the free experience should be nearly identical to the paid experience. However, to increase the number of paid customers, the paid experience should have obvious benefits over the free experience. Finding the right balance between these layers (i.e., maximized profit) can be achieved through significant amounts of testing over the full lifecycle of the product (during design and development, and even after release).

Contractual Relationships with Complementary Businesses

In some cases, a free product can earn revenues from other businesses that receive complementary benefits. A notable example is Mozilla, which gives its Firefox web browser to users for free while earning revenues from paid contracts with Google on the condition that Google is set as Firefox's default search engine [26]. Similarly, social-casual game developer Zynga has developed a strong contractual relationship with Facebook. In an addendum to their recent IPO filing, it was revealed that for key games, "Zynga will require all Zynga Users to be logged-in to their FB account ... [and] Zynga Users who are not Facebook Users must create a FB account" [27]. In exchange Facebook will "help the gaming company meet its active user targets" [28]. Further, while Facebook does not currently share its own ad revenues that appear alongside Zynga's games, it "could in the future" [29]. The strength of Facebook and Zynga's relationship, however, is also linked to revenues from virtual goods.

In 2009, Facebook was largely missing out on a $1 billion virtual goods market that was conducted primarily through its own website [30] [31]. Subsequently, Facebook demanded that all of its game and app developers use Facebook's own payment system, called Facebook Credits, through which Facebook takes a 30% cut of all sales (copying the precedent set by the Apple App Store) [32] [33]. However, using the below stakeholder map in Figure 3-a, it is apparent that Zynga, which provides some of Facebook's most popular content, has leverage to negotiate because it drives a significant portion of Facebook's viewership and ad revenues (and likely has influence over other developers). However, Zynga has also been at the mercy of unwanted changes to Facebook's social networking platform, which have had negative effects on game usage. For example, when Facebook removed access to a pair of notification methods, "almost every social games company experienced losses in traffic ... Zynga lost 10% of their userbase" [34]. As a result, Zynga appears to have given up 30% of its sales to Facebook (strengthening Facebook's platform position) in exchange for assurances of longer-term stability (as illustrated by Figure 3-b).

Figure 3: Zynga stakeholder map



Facebook does not guarantee revenue growth, but is instead obligated to help Zynga meet total user targets (measured as Monthly Unique Users or MUUs), so it is still Zynga's responsibility to convert their users into paying customers. In addition, Facebook has agreed not to develop any games themselves, which reduces potential friction between them and Zynga. This stipulation appears to be the result of a lesson from the web browser war between Netscape Navigator and Microsoft Internet Explorer (IE). In that case, Microsoft also controlled the underlying platform (Windows) that both browsers used, which gave it a significant advantage in gaining share for IE, and it ultimately won the war by bundling IE with Windows (where IE became the default browser) for free [35, p. 318]. If Facebook developed its own games it could have serious advantages by giving its games preferential treatment in newsfeed rankings and by providing itself with the most sought for ad spaces on its site (i.e., the ads shown to the small percentage of players who buy virtual goods). By contractually obligating Facebook against developing games, Zynga has protected itself from perhaps its most powerful potential competitor.

However, there are a couple caveats to contractual-oriented revenue models. One is that these relationships can be fragile. If Google's Chrome browser takes a large enough share of the market, they may opt to cancel their agreement with Mozilla, which would eliminate the majority of Mozilla's revenue. On the other hand, Zynga would not find itself in such dire circumstances if its contract with Facebook ended because it would still be earning revenue from virtual goods. The other caveat is that the free products company must drive enough customers to its benefactor such that forming a relationship is an important strategy for both parties. Most startup companies will have a tough time forming similar relationships because few have a large enough user base to create significant revenues for other parties.

A look at Zynga's financials

In 2010, Zynga's revenues were roughly $600 million, and in the first half of 2011 their revenues were already around $500 million, but how profitable are they really? This section investigates Zynga's Form S-1 (submitted to the SEC with the intention of an IPO) in order to provide benchmarks for businesses making similar products and to compare a virtual goods company to other types of successful software firms. However, since virtual goods are classified as intangible assets with short life spans, they can have unique effects on the way revenues are recognized, so this requires some manipulation to make revenues from different periods comparable. Furthermore, Zynga's S-1 addendums have suggested that its profits have been stagnating, so the possible reasons for this falloff will be considered.

Table 2 below uses several metrics to compare Zynga's 2010 financials to other major product-oriented and SAAS software firms during roughly the same period. Zynga appears to fit somewhere in the middle of these companies, although its high revenue growth suggests that the other metrics may still be volatile. Research and development is also relatively high because the firm is rapidly growing.

Table 2: Financial comparison of Zynga to other Software Products and SAAS firms

Firm	Operating Profit	Gross Margin	Revenue Growth vs Prior Year	Revenue per Employee	SGA & Marketing / Revenue	R&D / Revenue
Microsoft [36]	39%	78%	12%	$777k	26%	13%
Google [37]	35%	65%	24%	1,202k	16%	13%
Salesforce [38]	6%	80%	28%	$292k	63%	11%
LinkedIn [39]	8%	82%	102%	$246k	38%	27%
Zynga (2010) [23]	21%	71%	392%	$403k	25%	25%

Meanwhile, traditional video game firms Activision and Electronic Arts, which deliver most of their products as shrink-wrapped goods (increasing Cost of Goods Sold), have substantially lower margins than Zynga, but achieve higher revenues per employee (see

Table 3). Relative SG&A, marketing and R&D expenses, on the other hand, seem quite similar, which makes sense given that they all rely on advertising and frequent product development. While Electronic Arts has the highest R&D percentage of any of these firms (as it tries to offset dwindling franchises with new product), we will see further below that Zynga soon matches them.

Table 3: Financial comparison of Zynga to traditional gaming firms

Firm	Operating Profit	Gross Margin	Revenue Growth vs Prior Year	Revenue per Employee	SGA & Marketing / Revenue	R&D / Revenue
Activision Blizzard [40]	11%	52%	4%	$585k	20%	14%
Electronic Arts [41]	-9%	58%	-2%	$472k	29%	32%
Zynga (2010)	21%	71%	392%	$403k	25%	25%

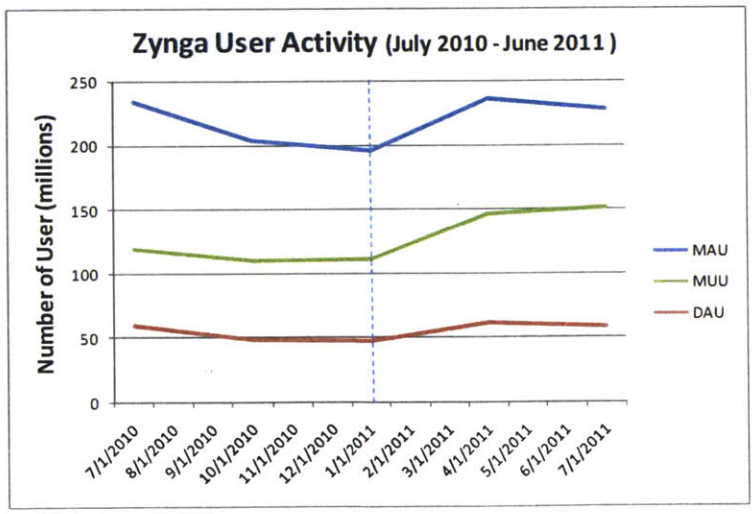
In Zynga's addendums to their S-1, they published new financial data for the first half of 2011; however, the revenues for this period are not directly comparable to prior periods because Zynga reduced the time over which it amortizes its virtual goods. By doing this Zynga effectively increased its reported revenue, which caused some controversy because its sales during the same period stagnated and the accounting change appeared to prop up their performance. Table 4 shows that by backing out these additional revenues, Zynga's expenses have grown at a faster rate than their sales (the SG&A and R&D metrics have increased 17% from the prior year), which would explain why operating profit has fallen by nearly the same amount. However, the problem is not that their expenses are increasing so much as their revenue stopped growing at the same rate.

Table 4: Zynga's performance in Q1 and Q2 of 2011

Firm	Operating Profit	Gross Margin	SGA & Marketing / Revenue	R&D / Revenue
Zynga reported Revs. (1st half 2011)	9%	72%	31%	32%
Zynga backed out Revs. (1st half 2011)	3%	70%	33%	34%

Some journalists have suggested that Zynga's faltering performance during the first half of 2011 was attributable to a drop in users during its second quarter when only one new game was released [42]. However, Figure 4 shows that the number of monthly and daily active users (MAU and DAU) was actually higher than the previous six months, while the number of monthly unique users (MUU) actually increased in both the first and second quarter of 2011. What has been overlooked is that Zynga had been migrating to the Facebook Credits payment platform since July 2010 and only completed the transition in April 2011. Zynga's revenues are reported "net of the amounts retained by Facebook," which are 30% of every dollar, so during this time Facebook's fees have been gradually and invisibly reducing Zynga's rate of revenue growth [23]. If Zynga had switched to Facebook Credits all at once, there would have been a more obvious shock to its revenues.

Figure 4: Zynga's user activity levels from mid-2010 through mid-2011



Now that Zynga has completely switched to the Facebook Credits system, their rate of growth should return to expected levels, unless there are additional factors that have not been accounted for. The growth of expenses may also need to be recalibrated if Zynga wishes to maintain high operating profits, but doing so could hold back product development and platform strategies at a time in which the market is theirs to lose. Nevertheless, Zynga still experienced rapid revenue growth in the first half of 2011, and has been continually releasing new titles to strengthen its digital ecosystem.

Under what circumstances can free-to-play be successful?

Free products can attract the maximum number of potential users, but this maximum value is determined by each product's inherent appeal. Hollywood tries to increase the size of its potential audiences by creating films with "universal" appeal (hence the name of Universal Pictures). It is important for the major free-to-play companies to also make universal products because the average revenue per user is very small. Only by capturing a large number of users do these revenues become significant, so free-to-play products developed for a niche audience will likely prove to be unprofitable. Of course the costs are just as important to consider as revenues, and Parker and Van Alstyne suggest that the key to free products relies on low-to-no marginal costs because "providing each new sale or service then costs ... nearly nothing in incremental costs" [43].

The free-to-play model becomes much more feasible when there are low-to-no variable costs because the ancillary revenues have a much lower threshold (namely fixed costs) to reach profitability. For physical goods industries, including pizza making, variable costs have a significant impact on the bottom line. One free pizza will result in a few dollars loss (in dough, cheese and sauce), and too many free pizzas will quickly put a store out of business. Software, on the other hand, can be replicated at essentially zero marginal cost and the cost of transmission via the Internet is negligible. As a result, no new costs are incurred when a new user adopts a product. With millions of users the variable costs from bandwidth and data storage will become significant (Zynga currently claims to "process and serve more than a petabyte of content ... every day"), but when monetizing among that many users these costs are still manageable [44]. The bigger problem is attracting users in the first place.

As with many entertainment products, one of the biggest costs for gaming is typically advertising (a discretionary fixed cost). Strong word of mouth that lasts over a sustained period of time can reduce a firm's advertising needs because their customers promote the product for them. Word of mouth is typically affected by three major factors.

The first factor is a combination of the inherent appeal and quality of the product. The higher the quality the more likely that the users will talk about it, and the higher the appeal the more likely that potential users will adopt it. As previously discussed, a universal product will increase the inherent appeal to more users. The quality of the product for a social-casual game is generally determined by how much fun the user has while playing it. Unfortunately this is an intangible concept that is difficult to measure, but play-tests and focus groups are commonly used to gauge the amount of fun that users experience.

The second factor is simply the amount of currently active users because as they grow they increase the chances of contact with potential users. While this will not directly increase adoption it significantly increases the probability of adoption. This also means that without any users the probability of adoption through word of mouth will be zero, so advertising is necessary to gain a core group of initial users.

The third factor is the average duration of usage because the contacts between active and potential users occur over time, and as duration increases so will the number of contacts. For instance,

word of mouth lasts longer for a hit TV show than a hit movie because the show airs many episodes over multiple years while the movie only premieres in theaters once (although a major franchise with many sequels, such as *Harry Potter*, will have a longer duration). The duration of a typical game's usage is influenced by the game design and the amount of content. For instance, story-based games have more definitive endings so the duration is inherently limited by the design. Open-ended games (e.g., *Farmville, Second Life*) have a potentially unlimited duration depending on how fun they are. The duration of both types can be increased by increasing the amount of content (e.g., adding more story chapters).

The recent phenomenon of social media embodies these factors, and social media products become exponentially more valuable as more people use them. Game designs that allow social interactions can leverage principles of success established by the major social media platforms (namely Facebook, Twitter, Wikipedia, YouTube and Blogger). These principles and their possible applications in gaming will be discussed further in Chapter 5.

Recommendations

Based on this analysis there seem to be certain must-have factors for a free-to-play business model to work. Perhaps the most important of these is that there must be low-to-no marginal costs, which would otherwise cause losses for a free product to skyrocket. Since social-casual games fit this requirement it is important for the companies that design them to consider how they will make money with a free product. Most game developers in this space rely on a combination of advertising and virtual goods for the majority of their revenues, while premium features are sometimes implemented for game designs that do not support virtual goods. Based on these insights, it is recommended that developers utilize multiple revenue models across different products with a stress on virtual goods since that is where the most significant growth opportunities currently are.

A free-to-play company should also rely on three key metrics: adoption rates, conversion rates, and churn rates. For the average game, only 1-3% of users buy virtual goods and those that do only contribute $20 per month (for a successful game), so it is imperative that adoption rates be extremely high in order for revenues from this small percentage to become substantial. Increasing conversion rates (i.e., the 1-3% of paying users) even by a single digit will also have significant improvements to the bottom line assuming adoption rates are high. Finally, reducing churn rates becomes important when one considers that the average revenue per user occurs over time and not up-front. These metrics are further explored in the following paragraphs along with suggestions for how to improve them.

Increasing adoption rates

To increase a game's probability of adoption it is important to make the product universally appealing and accessible. Three potential levers for adoption, discussed in the following paragraphs, include marketing, gameplay and platform strategy. Recommendations for marketing and gameplay are somewhat "touchy-feely," while the below platform strategy discussion is focused on network effects caused by the use of complementary technologies. Note that these are not exhaustive recommendations for adoption, but rather ones that fit the context of this chapter.

Advertising is obviously a factor that can increase adoption, but there are important marketing factors to consider during product design stages. The phrase "the look, the hook and the book" is commonly used as a litmus test for the marketability of Hollywood screenplays and it can be adapted for many other mass market entertainment products [45, pp. 20-22]. The *look* usually refers to the popular actor/actress attached to star in a movie, but it can also refer to other visual elements that can help sell a movie (e.g., special effects). This characteristic is most applicable to big-budget console games, which often have dazzling graphics and sometimes even notable celebrities (e.g., Tiger Woods in *Tiger Woods PGA Tour,* Martin Sheen and Yvonne Strahovski in *Mass Effect 2*), but it may become more common for social-casual games if their budgets increase in the future. The *hook* refers to the underlying story or concept. Ideally, a game will be "high-concept," meaning that the fundamental idea for the game can be easily communicated (by advertising or word of mouth) in a single sentence and has a high appeal factor. The *book* refers to any presold property upon which a movie or game is based that has already become popular among consumers. For instance, the movie *The Da Vinci Code* achieved massive success largely because of the bestselling book upon which it was based. The presold property does not actually have to be a book as many console games are based on hit movies (and more recently there have been movies based on hit games). One of the first cases of such cross-media branding in social-casual games is Zynga's announcement that they will retrofit their recently released *Adventure World* as an Indiana Jones game [46]. Sequels, prequels and spinoffs also take advantage of this marketing characteristic by relying on the success of their predecessors. In the social-casual games space, Zynga has made particular use of this method by acquiring the successful *YoVille* and subsequently releasing *FarmVille*, *FishVille*, *PetVille*, *FrontierVille*, and *CityVille* [47]. The better a game developer can fulfill each factor of "the look, the hook and the book," the more marketable their game will theoretically become. Focus groups are often used to aid in selecting the types of marketing characteristics with broadest appeal.

Design factors with which the user interacts—namely the user interface and game difficulty—will also affect the adoption rate. A simple user interface will make it easier for new users to get started playing a game, and a gentle learning curve will prevent users from becoming aggravated by poor progress. A third factor is the mechanics of a game (i.e., the game rules), which can affect the minimum time required for a user to make any progress. Casual games strive for simple and intuitive design because they are meant to be playable by any person at any time and for any length of time. This design philosophy intends to attract larger markets than traditional console games because it can appeal to users who otherwise have not had the available time, patience, or money (simpler game designs often cost less to produce). The success of the Nintendo Wii, which effectively increased the market for console games by focusing on a combination of casual design factors and innovative technology, is evidence that this philosophy works [48, pp. 31-32]. However, it is possible for a simple game to be too easy, causing the user to lose interest. Play-testing, a phase in which members of the target market segment are invited to play pre-release versions of the software, is useful for judging the effectiveness of the user interface and the learning curve (although long term effectiveness may not be seen until after release).

A platform strategy can be used to increase adoption by integrating a product with other platforms that have access to large numbers of users. The most obvious such strategy that game

developers are currently implementing is integration with Facebook and other social networks, which creates very strong direct and indirect network effects. However, there are more subtle direct network effects at play that also serve to reach the broadest audience possible. For instance, most social-casual games use Adobe Flash as a platform because it is installed on 99% of Internet-enabled computers and can be played in nearly any web browser [49]. Further, social-casual games are primarily developed for Internet-enabled computers, benefitting from a much higher adoption rate than video game consoles. Some games have dual platform support by using Flash for personal computers and separate apps for mobile phones. It is possible, however, that in the future more games will be developed with HTML5 (pending better HTML5 development tools and uniform cross-browser support), thereby allowing a single version of the game to be played on any machine with a web browser and reducing development costs by eliminating the need for separate mobile apps [50]. Other applicable aspects of platform strategy will be discussed in Chapter 3.

Increasing conversion rates

There are two methods to increase revenues through conversion rates, the first of which is to increase the number of users that buy virtual goods, but this is a particularly challenging problem primarily due to a fear of data/identity theft and a perceived waste of money. Fortunately for game developers, the Facebook Credits payment platform is making strides to overcome these issues by adding the Facebook brand name to all transactions and ensuring greater data security. Furthermore, Facebook Credits allows greater flexibility with stored money, which can be applied toward any game, app or other service within Facebook instead of being restricted to just one. Finally, Facebook and Apple are "taking steps toward making their purchases compatible with one another," which will further increase the flexibility and value of Facebook Credits, while also tapping into customers that have already been comfortable making online payments to Apple [20, p. 6]. All of this seems to mean that Facebook is trying to increase the 1-3% of paying users on behalf of game developers using their platform. Still, game developers should strive to make their virtual goods as attractive as possible in order to maximize this percentage.

The second method for increasing revenues through conversion rates is to increase the frequency of purchases from the existing paying users. This problem is more directly related to a game's design, which can create opportunities for sales. Creating attractive virtual goods is an important first step, but so is the manner in which they are sold. For instance, offering rare or exclusive items for a limited time will spark more urgency to buy, even though digital items have no scarcity whatsoever. A common strategy that Zynga appears to use is to trade time for money, meaning that a user can obtain any virtual good for free within the normal gameplay. To obtain the more desirable and higher-priced items, however, it may take a very long time, so simply purchasing the item allows the user to bypass the required time and achieve their goal sooner. After a game is released, the developer should also take care to optimize game elements that affect the frequency of payments (e.g., the timing of exclusive items), while also making sure any modifications do not negatively impact other factors such as adoption and churn.

Reducing churn rates

From this business model analysis, it appears that free-to-play social-casual games have a lot in common with traditional software-as-a-service (SAAS) companies, such as Salesforce.com and HubSpot, which earn revenues in small payments over the lifetime of their customers instead of one large license fee up-front. The unique problem for SAAS companies is that the average lifetime of users has a dual impact on both revenues over time and word of mouth (which in turn affects revenues), which significantly affects return on investment. Therefore it is critical to focus on reducing what SAAS companies commonly refer to as the churn rate (also known as the decay rate or death rate).

As previously discussed, the churn rate for a game will be largely determined by both the design and the amount of content. Games designed to have no definitive endings have the potential for long user durations. Once a game is released, the design may be tweaked in order to optimize its effect on usage, but eventually there will be diminishing returns. At this point, it is better to focus on increasing user duration by adding new content, although it is important to note that new content is not possible for all game designs (e.g., little new content can be developed for a chess game). Incorporating social interactions effectively creates another form of content to boost user duration, but actual game content comes first.

Chapter 3: Platform strategy in social-casual games

In the closing summary of *Platform Leadership*, Gawer and Cusumano suggest that the essence of a platform strategy is "recognizing that certain kinds of products have little value by themselves but can be extremely valuable as the center of a network of complements" [51, p. 296]. This recognition explains how a relatively simple Flash-based computer game that integrates multiple networks can generate millions of dollars in revenue. The purpose of this chapter is to analyze how platform concepts are currently utilized by social-casual games and to consider how they may be extended for further gain, but first it is necessary to explain what is meant by the term *platform*.

Cusumano argues that there are two types of platforms, the first of which can be thought of as "an in-house product platform" that is primarily used to promote modularity among product families in order to cut costs and gain economies of scope [52, p. 23]. Product platforms are effective at reducing costs across product families. For example, Utterback noted that when Black and Decker "redesigned its entire line of power tools in the early 1970s" to increase the sharing of subsystems and implement other process improvements, the resulting manufacturing system "required one-seventh the labor input and 39 percent less in terms of materials and overhead costs" [53, pp. 142-143]. Similarly, after studying Honda's development process in the auto industry, Meyer suggested that one of the keys to success is the "ability to leverage common subsystems across different product lines," and "if no subsystems were common ... an automaker would be unprofitable" [54, p. 172]. Product platforms can be a competitive advantage when companies are faced with price competition and can also reduce development and manufacturing cycles, but they are generally a minor part of a bigger strategy.

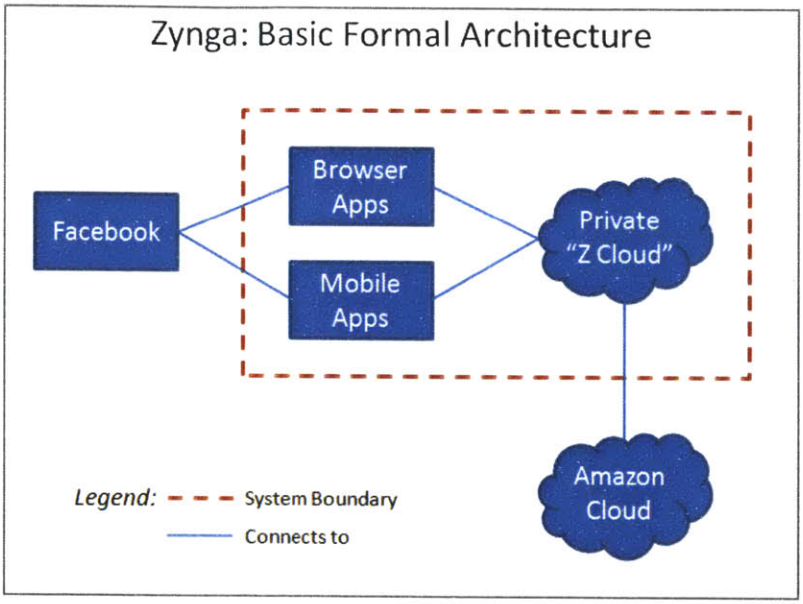
Zynga uses a set of frameworks collectively called ExampleVille as a product platform from which to design new games. According to a Director of Engineering at Zynga, "new game teams need to have an easy way to get started on games and don't need to reinvent the wheel in most areas, especially when it comes to our proprietary internal services. ExampleVille solves this problem by doing most of the work for them to get them up and running (like a template)" [55]. These software frameworks create economies of scope through "efficiency across building separate products" [56, p. 166]. Zynga's development teams are free to choose which frameworks to use and which product features to develop themselves.

ExampleVille can be thought of as having a client-side framework and a server-side framework. During my interviews at Zynga's Boston office, I learned that the server-side framework is more heavily re-used for two key reasons. The first reason is that games are being adopted at increasingly fast rates, so the technical requirements for scaling games are complex. In Figure 5 below, we can see that Zynga makes use of both a private cloud (containing Zynga's own web servers, application servers, and databases) and a public cloud hosted by Amazon.[2] Zynga leverages the Amazon cloud for periods of rapid growth and high volatility in usage, and relies on its own cloud when demand is more stable and predictable. Zynga's CTO of Infrastructure Engineering describes this as a hybrid environment that they "architect and manage ... as one system" [57]. Without re-usable frameworks, integrating with and

[2] Browser-based game apps generally utilize Flash or HTML5 technologies and are accessed through Facebook's website. Mobile apps are standalone applications for mobile devices that interface with Facebook Connect.

managing multiple clouds would add significant development time and require additional engineering expertise for each product and development team. The second reason that server-side frameworks are used more often is that the creativity in game design is generally on the client-side—namely in the user experience. To this point, Zynga Boston developed its own rendering software, dubbed Boston Rendering Optimization (BRO), rather than using the existing client-side rendering components because it wanted to create a game with a different "style and scope" (resulting in *Adventure World*) [58]. BRO has since migrated into ExampleVille's collection of frameworks and is available for use by other teams. However, these frameworks are still just product platforms.

Figure 5: Basic formal architecture of Zynga's game apps and cloud system



The second type of platform is the "industry platform," which has "relatively little value to users without complementary products or services" and features the "creation of network effects" [52, pp. 23-24]. For industry platforms, the platform is both the product and the strategy. Some of the most well-known examples of industry platforms include Microsoft Windows, JVC's VHS videocassette, the Apple iPhone and Facebook. These are products that have created their own ecosystems connecting complementary products/services and users. A variety of key concepts are useful in the analysis of a platform business, including multi-sided markets, platform ecosystems, winner-take-all markets, product versus service business models and platform stickiness. Firms can dominate the market for years with an industry platform under the right conditions, which is a particularly attractive scenario in gaming because the products tend to have short lifecycles.

The following sections will apply these industry platform concepts to social-casual game developers in order to assess their position as platform leaders and identify potential risks or gaps in strategy. There is a heavy focus on Zynga because it has the largest presence in the market and as a result there is more available data. While Zynga has a significant lead on its competitors, the current nature of the market suggests that other companies will have the opportunity to take market share.

Zynga's recently announced Project Z, a niche social network for gamers, provides the opportunity to create an industry platform that will maintain Zynga's user base over a longer period than any single game [59]. Please note that when the term platform is used henceforth it will generally be referring to the notion of industry platforms.

Multi-sided markets

Eisenmann, Parker and Van Alstyne's definition of a platform suggests that "products and services that bring together two groups of users into two-sided networks are platforms" [60, p. 94]. The essential idea is that for a company's product to be a platform, it is not simply being sold to one market, but allowing multiple markets to interact through the use of the product. Table 5 shows that most social-casual games have implemented a platform strategy by developing a system in which users interact with advertisers, lead generation offers, and other users (making social exchanges). The social exchanges are actually enabled by each game's integration with Facebook (and other social networks), so it is necessary to consider that both platforms together provide this capability. The caveat is that most of the money made by these games is through virtual goods.

Table 5: Zynga's multi-sided markets

Side 1	Platform Provider(s)	Side 2
Users	Game Developers	Advertisers
Users	Game Developers	Lead Generation Offers
Users	Game Developers & Social Networks	Users

Virtual goods are sold by game developers on top of their own games (akin to the idea of a pizza maker selling toppings for a free pizza). In this scenario there is no second side of the market and the product does not serve as an industry platform. Since the direct payments for virtual goods make up the majority of revenues made by most social-casual game developers, their platform strategy on the surface appears to be relatively weak. However, the social exchanges occurring in games that integrate social networking platforms have such powerful network effects that they indirectly increase virtual goods revenue by increasing adoption rates and user duration. As a result, the source of revenue is not necessarily a good indicator of a successful platform strategy, and in the case of social-casual games it may be better to look at the number of users playing them over a period of time.

A basic strategy used by platform firms in multi-sided markets is to subsidize one of the sides of its network. For instance, Microsoft subsidized third party developers by providing free development tools and not charging royalties, which helped enrich the Windows platform with new applications for users. However, in most cases it is the consumer that is subsidized because they are generally more price sensitive. In the case of social-casual games, the users are being subsidized because the games are free-to-play, thereby increasing adoption rates, which in turn increases the value of the platform to the other market sides (even to other users who will have more people with whom to interact).

Another way to enhance a platform strategy is to add more market sides. Facebook has been continually reaching new markets with Facebook Connect, a service that allows other organizations to embed Facebook's social features within their own website or app. For social-casual games it is less obvious what market sides can be added, but there are a couple unique examples that may suggest possibilities. Linden Lab's *Second Life* achieved a true virtual commerce, in which its users are both buyers and producers of virtual goods and conduct sales amongst themselves within the game [61, pp. 59-80]. Valve Corporation, on the other hand, gave its users the ability to develop entirely new games on top of its existing product by providing a software development kit (SDK) that contained tools to create and edit character models, maps and other features. It is unclear, however, whether these ideas can be applied to social-casual games without hurting revenue from virtual goods. Zynga's Project Z provides more promising possibilities.

Project Z uses Facebook Connect to provide a platform to Facebook gamers that want a social network, apart from their existing Facebook network, that focuses on a shared interest in games. A user's Project Z network will initially include existing friends (who play Zynga games), but it will also allow new connections to be made between users that have only met in-game. Project Z gives Zynga the ability to increase its advertising business since there are more opportunities for ad impressions on a website than in a game (increasing the scope of Zynga's ad market). At the same time, Project Z will serve as a portal designed for Zynga's games. If Zynga releases application programming interfaces (APIs) that allow other developers to create Project Z apps, it can create the equivalent of a traditional video game platform (e.g., the Microsoft Xbox) but in the online world.

Microsoft manufactures the Xbox (a hardware platform), for which it has funded several of its own games. However, Microsoft also allows other firms to develop Xbox games because it strengthens the platform's ecosystem and gives customers more reasons to buy it (not to mention Microsoft receives a license fee on each game sold). Zynga has the potential to create a similar ecosystem with Project Z, for which it already develops its own games, but through APIs other firms could add their games to the portal and increase the value of Project Z to users (increasing potential ad revenues for Zynga). Microsoft encourages this strategy by providing a set of development tools (e.g., SDKs, IDEs, code libraries) collectively referred to as XNA (Xbox New Architecture) to other firms.

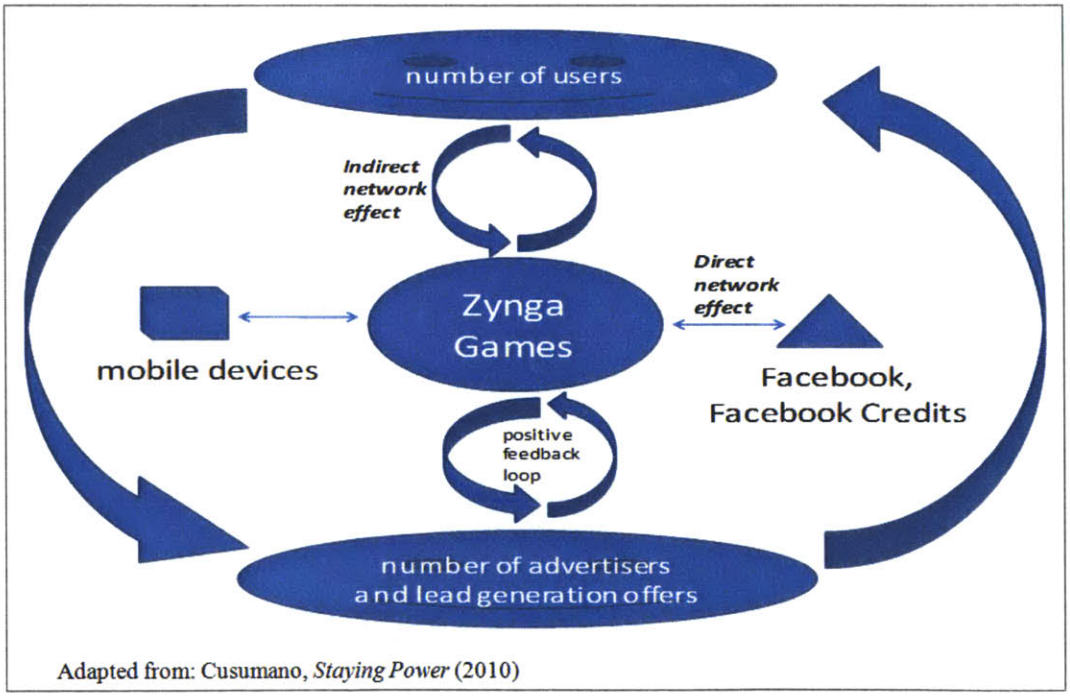
Microsoft's XNA framework is used by third party game developers (for the Xbox and other Microsoft platforms) because it "liberates developers from spending too much time writing mundane, repetitive boilerplate code. Instead, XNA frees game creators to spend their time where it matters most --on the creativity that differentiates their games" [62]. Essentially it decreases development times and moves companies down the learning curve at a faster rate, so that new games are released more frequently and with higher quality. This is very similar to how Zynga's internal development teams use the ExampleVille framework to reduce the time spent on server-side coding and focus on more creative client-side apps. Should Zynga decide to open Project Z for outside developers, it can license ExampleVille to those developers in order to increase their development speeds. This will increase competition amongst the games, but enrich the Project Z platform for users.

A potential problem for Zynga, discussed later in this chapter, is that it is unlikely to maintain its lead in social-casual games based solely on the strength of its games. While each game is in many ways its own platform, they each have relatively short lifecycles. Project Z serves as a potential remedy to user decay because it can keep users in Zynga's ecosystem even when they are not playing. By adding more content to Project Z via third party developers, the social network will become even stickier (a concept explained at the end of the chapter) and help maintain Zynga's user base during periods when the firm does not release new and successful games.

Platform ecosystem

Understanding how complementary products/services relate to network effects is critical to developing a platform strategy. Figure 6 below maps the relationships between Zynga's games, Facebook and mobile devices [52, p. 25]. Typically one thinks of the game as a complement to these other platforms, but it depends on point of view. As more people adopt Facebook, the market for Zynga's games increases. Zynga has also started focusing on smartphones and tablets as users shift towards those platforms. These cause direct network effects, in which the technical compatibility between Zynga's games and its complements increases the number of users. There are also indirect network effects, which describes how an increase in number of users causes an increase in number of games and vice versa. Further, an increase in number of users causes an increase in number of advertisers (and thus ad revenues), which increases the number of games and eventually pushes the number of users even higher.

Figure 6: Zynga's current ecosystem



Adapted from: Cusumano, *Staying Power* (2010)

This mapping helps us understand the dynamics of Zynga's ecosystem, but to think strategically about a platform's positioning we must consider the decisions that led to this state. Gawer and Cusumano discussed this issue by writing:

> Platform leaders need to recognize that they depend on an ecosystem or network of innovation to produce complements that make the platform more valuable. This should be a thriving ecosystem for the platform to be as successful as possible. Therefore, determining the scope of the firm—in other words, what complements to make inside and what to leave to external firms—is probably the most important decision that platform leaders have to make [51, p. 246].

They describe a firm's scope as one of four levers of platform leadership with the other three being product technology, relationships with external complementors and the firm's own internal organization. The reason scope is so important is that it defines the platform's role in the ecosystem. For instance, Zynga and other social-casual game developers chose to integrate the external complementary service Facebook, instead of developing all of their own social functionality in-house. This strategy has allowed Zynga to benefit from Facebook's rapidly growing user base while also strengthening Facebook's own ecosystem. Zynga actually serves as a complementor to the Facebook platform and vice versa. As Zynga grows it causes more users to spend more time on Facebook (seeing more of Facebook's ads), and as Facebook grows Zynga is able to tap into an even larger set of users. Together the companies represent two layers of platforms, in which Facebook gamers are connected to two different groups of users and advertisers.

In console gaming, one can see a different use of the scope lever. For example, the Sony PlayStation 3 and Microsoft Xbox 360 consoles, as well as Valve's game downloading service Steam, each have their own social networks that were developed in-house and offered as part of their gaming platforms. The difference for these more traditional gaming companies is that they control the core product with which users interact, enabling them to develop their ecosystems from scratch. Start-ups without the resources to develop their own ecosystems, like Zynga and the coupon service Groupon, have grown rapidly because they were able to tap into Facebook's ecosystem, which was growing even faster at a time when there was little competition from other third party developers.

While many companies have benefitted from Facebook's growth, there is the risk that Facebook "may 'lead on' some third-party complementors" [51, p. 83]. Gawer and Cusumano used the notion of 'leading on' to describe how complementors may invest in new platforms that fail to materialize, but this idea can be extended to describe how the intended use of an existing platform by its complementors may abruptly change as well. Chapter 2 provided two such cases, the first when Facebook removed access from game developers to a pair of notification methods, causing a significant drop-off in their usage rates, and the second when Facebook required all third-party apps to use its Facebook Credits payment system, through which Facebook takes an immediate 30% cut of revenues. Being the largest company in the virtual goods market, Zynga was able to negotiate with Facebook for growth security, but it is unclear whether any of Zynga's primary competitors received similar consideration when Facebook implemented these platform changes. Further, much smaller developers with no bargaining power are forced to accept such changes with little recourse. Therefore, any

company that receives large benefits from a complementary product/service should consider the risk of such changes (measured as the probability of an event occurring multiplied by the financial impact of the event) and be proactive in mitigating them. Firms as large as Zynga will have sway with their complementors, but smaller businesses should develop alternative strategies (such as integrating with more than one social networking service).

Companies can also produce their own complements in order to increase direct network effects and maintain a customer/user base over time, but how this strategy is implemented may depend on the given industry. A classic example of this in the auto industry is General Motors' "five-model product range that ran incrementally from cheap to expensive, from Chevrolet to Cadillac," which GM's president, Alfred Sloan, reasoned would "fully accommodate potential buyers of every income throughout their lives" [63, p. 41]. For instance, as a customer lost interest in their Chevrolet they could move on to the next model in GM's portfolio, and so on and so forth until they were nearing retirement age and could afford a Cadillac. As a result, GM increased its ability to maintain its customer base over time by funneling customers from one model to the next as they grew older. However, differences in the auto and gaming industries suggest that there will be differences in this strategy.

Social-casual games have much shorter user lifetimes than cars so new games have to be released frequently enough to funnel users forward onto new product. At the same time, games with significant social elements lose some of their entertainment value as the total number of active users falls, so for older games it eventually becomes harder to attract new users (unlike Chevrolet, which maintains appeal to new customers even as others are funneled to successive makes). Figure 7 illustrates how a game developer should think about funneling users from an aging title (Game A) to a newer one (Game B), while Figure 8 shows a similar timing between Zynga's two most successful games (*FarmVille* and *CityVille*) in terms of monthly average users (MAU). Judging by the dropoff rate in *CityVille's* MAUs, Zynga will want to release another similarly big hit (or multiple smaller hits) within the next 6 to 9 months in order to keep decaying users in its ecosystem.

Figure 7: Funneling decaying users to new products

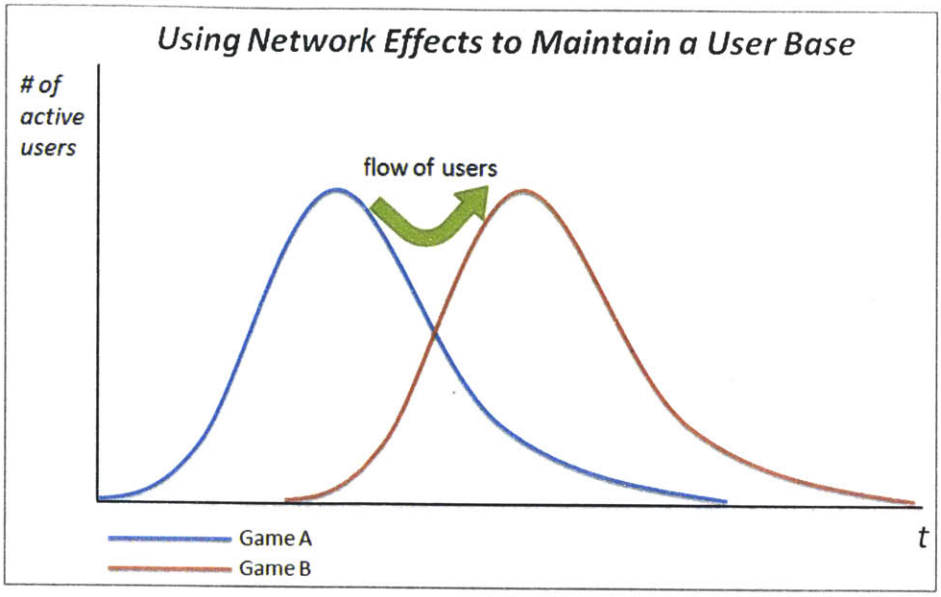
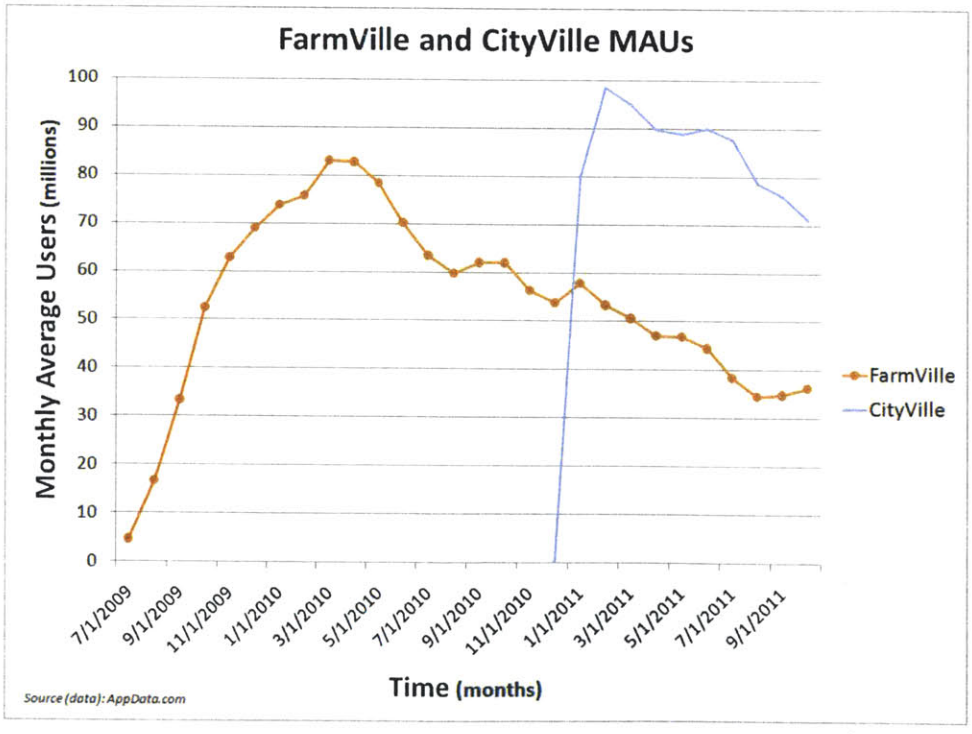


Figure 8: Timing between Zynga's *FarmVille* and *CityVille* releases



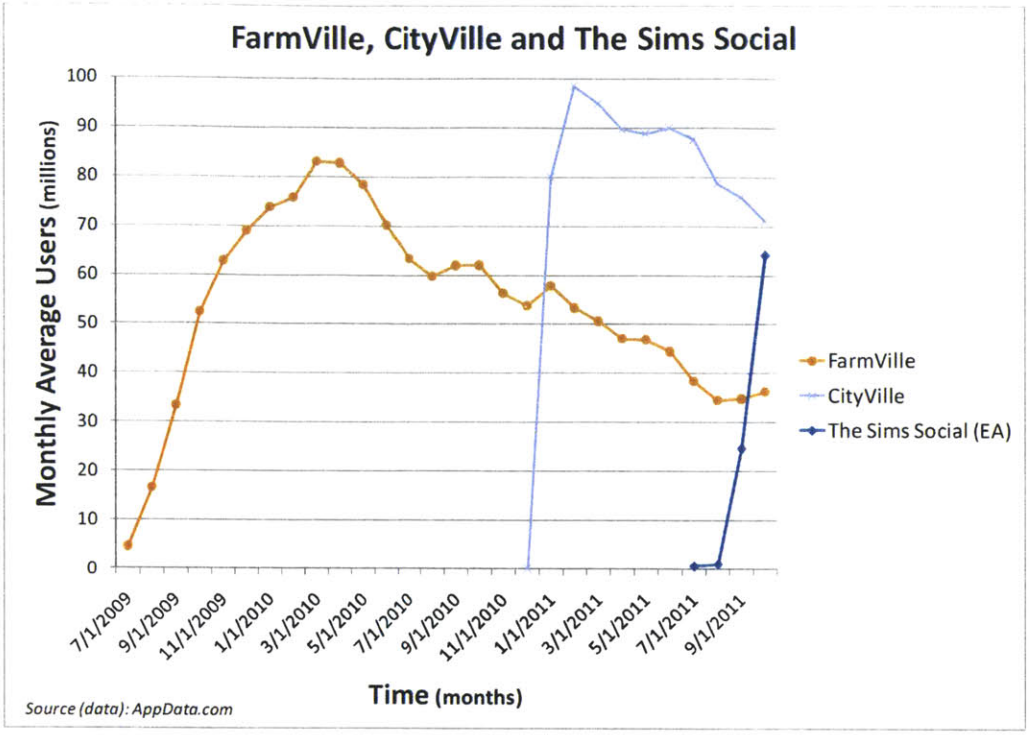
Multiple gaming news sites have suggested that Zynga, which has one of the largest portfolios of social-casual games, is already employing this strategy by funneling older users to newer games [64]

[65]. For instance, Zynga's *Farmville* and *Words with Friends* apps have funneled users forward by frequently containing ads to newer Zynga games of similar genres, including *The Pioneer Trail* (an expansion of *FrontierVille*) and *Hanging with Friends*, respectively. For one of their most recent releases, a Zynga representative confirmed that a significant percentage of the game's users came from previous titles, although they could not quote an exact number.

There are some caveats to this strategy because the flow of users between successive games will not actually be one-to-one as suggested by Figure 7. Varying factors such as quality and appeal will affect the percentage of users funneled forward. Some games may also have much longer user lifetimes making it harder to stage new releases without some self-cannibalizing. Finally, while few individuals own more than one car due to high costs, gamers can easily participate in more than one social-casual game at a time because they are free. As a result, many users will continue to play Game A even as they start to play Game B. The free price helps make it possible to funnel users backward to older titles as well, although logically this will capture a smaller set of users because older games generally have less hype and declining numbers of total active users (reducing the social aspect of the experience).

Since users can be active for multiple games at once, a developer will actually share part of its user base with other developers. For example, Electronic Arts' recently released *The Sims Social* has become only the third game on Facebook to reach more than 60 million MAUs, and one report found that "the majority of *The Sim Social's* players play Zynga games" [66]. The problem is that these users only have so much time available to play games so EA and Zynga are actually fighting for a higher share of each user's play time. Since *The Sims Social* is newer, it has had negative effects on Zynga's share of play time and "has stolen 10-25% playtime from Zynga's top games" [66]. Perhaps the biggest issue for Zynga is that *The Sims Social* has been growing at a time when its own megahits *FarmVille* and *CityVille* have been falling (as shown in Figure 9), and as a result, some of their users are being funneled into EA's ecosystem instead of their own.

Figure 9: EA's *The Sims Social* experiences rapid growth as *FarmVille* and *CityVille's* MAUs fall



This problem illustrates how easily new developers can take market share with hit titles, largely because the lifecycle for games is fairly short and users can easily play more than one game at a time. While Zynga's ecosystem is currently the strongest in the market, the games that are at its center are in a constant state of flux, as old games die out and new ones are released. The following section explores this problem in more detail by explaining why Zynga's chances of taking over the entire market are low, although Project Z may be able to improve its potential for long-term dominance by serving as a stable platform at the center of its ecosystem.

Winner-take-all markets

Certain platforms can become so widely used that they develop a monopoly position in the market. For example, Microsoft Windows has had a monopoly position in operating systems for well over a decade, but not all platforms have this potential. Video game consoles are often used to illustrate a platform 'war' that has been ongoing for the past 30 years, a period in which no company has dominated the market for more than one or two generations. The Eisenmann article suggests that winner-take-all dynamics occur among competing platforms when the following three conditions are met:

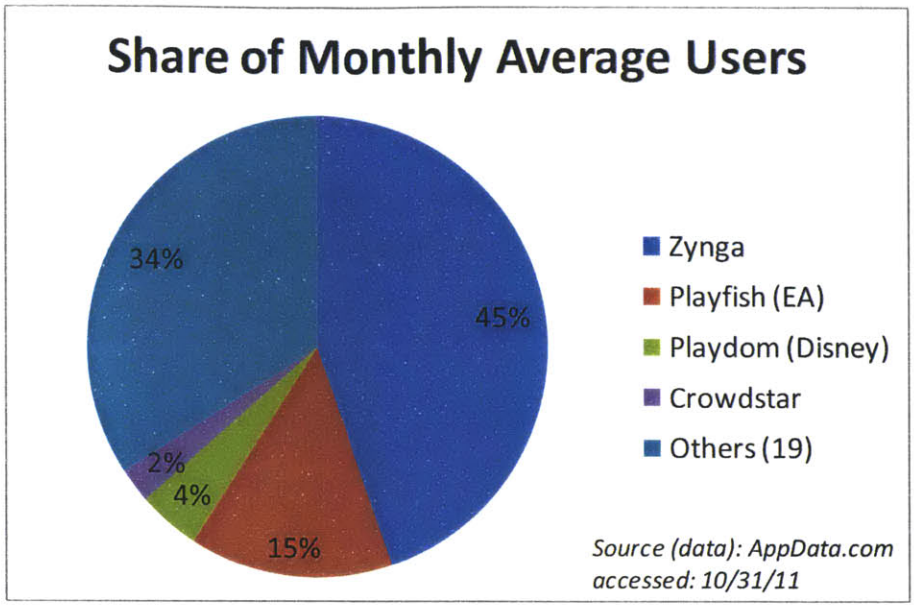
- multi-homing is uncommon for at least one user group
- network effects are prevalent at least for that same user group
- neither user group needs special features

Applying these criteria to Windows, we can see that Microsoft gained its monopoly because computers have generally been expensive for users, which has reduced multi-homing. Network effects are high because developers want to make applications for whichever platform has the most users and because users generally adopt whichever platform has the most applications. There has also been relatively little differentiation between Windows and competing operating systems, suggesting that few users and developers need special features. Together, these factors have allowed Microsoft to dominate the operating systems market for over a decade and through successive product generations.

Facebook is an interesting case because it appears to be gaining either a winner-take-all or winner-take-most position in social networking even though there are no real multi-homing costs that prevent users from also using MySpace or Google Plus (although there may be significant time costs when using all of them). There has been some differentiation between these platforms, but the core service they offer (sharing social content between family and friends) is nearly identical. Network effects are extremely high because users simply want whichever service most of their friends are also using. The combination of very high network effects and few feature needs appears to overcome the multi-homing issue. The fact that Twitter continues to thrive may have more to do with the fact that Twitter's core service is micro-blogging and differs from a typical social network. With Facebook and Google Plus incorporating micro-blogging features (attempting to envelop the service), it remains to be seen whether Twitter will be hurt in the long run.

Social-casual game developers are probably not in a winner-take-all space since there is high-differentiation between games and since the lifecycle of games is relatively short, allowing new games to enter the market frequently. Furthermore, multi-homing is very common since the games are free-to-play. As a result, network effects appear to be the only factor that could make it possible for one company to dominate the market. Surprisingly, however, Zynga is nearly in a winner-take-most position with the largest number of total MAUs per game on Facebook, nearly the same amount as all of its competitors combined (see Figure 10 below) [67]. With roughly a third of the market still controlled by 19 smaller firms, it is evident that social-casual gaming is still highly fragmented and Zynga probably benefitted from a first mover advantage. While Electronic Arts and Disney are now among Zynga's competitors, many major traditional game developers (e.g., Activision Blizzard, Konami, Take Two Interactive, etc.) may still enter the market as well, which will make it harder for Zynga to maintain its lead. It is important to note that the share of monthly average users is not a true measurement of market share since it does not indicate revenues; it more accurately represents mindshare, which can then be converted into revenues based on each developer's conversion rate (Zynga's conversion rates are thought to be best in class, but no competitors have publically shared their data for comparison).

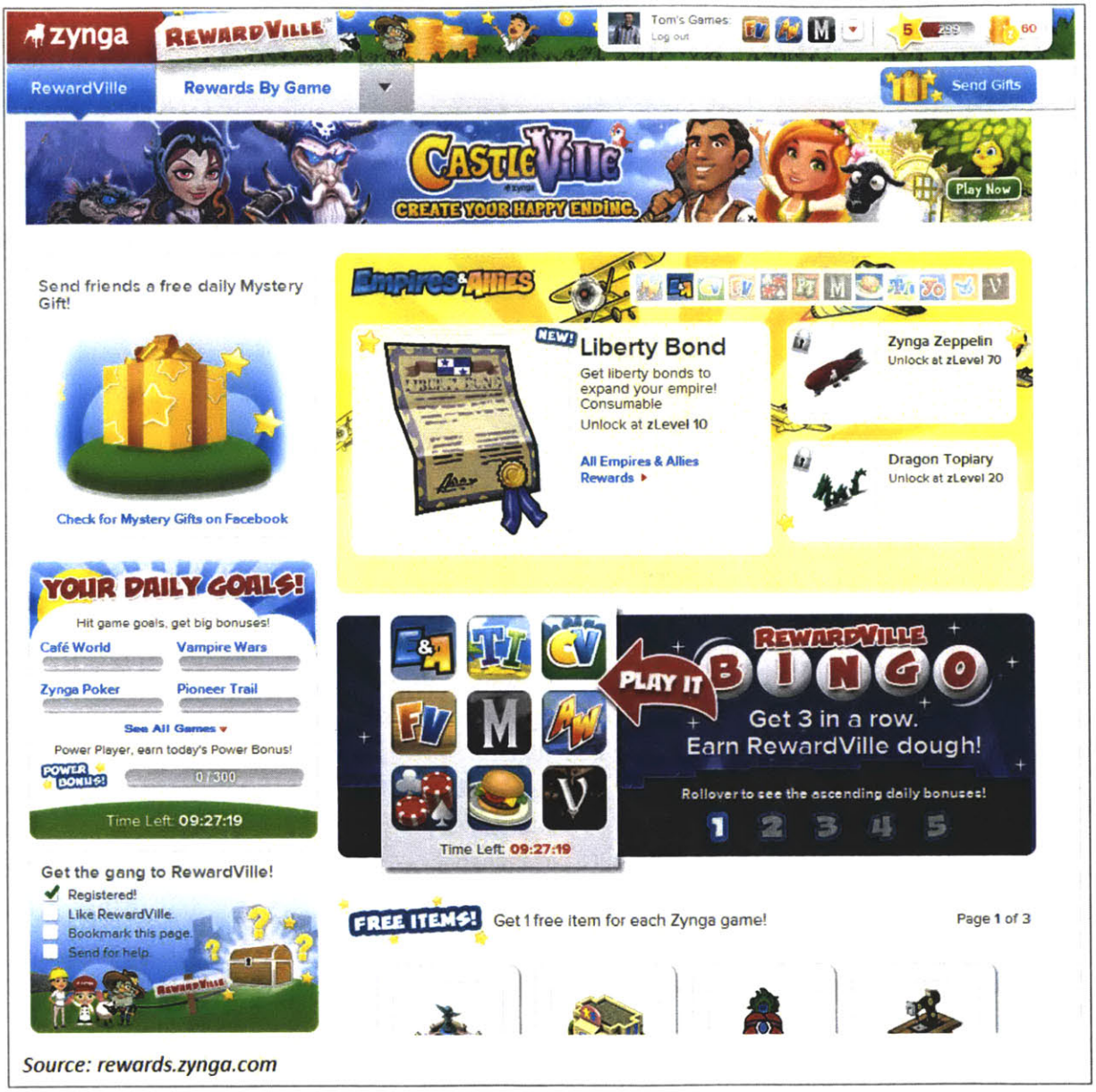
Figure 10: Approximating mindshare in the social-casual gaming market



Zynga's current platform strategy has proven to be so effective that for the time being it is dominating online social-casual games, but as each game's popularity fades and as more competitors enter the market, it will become harder for Zynga to repeat its success solely on the strength of individual products. Worse, if Zynga releases a string of flops, then it will probably find itself out of business. However, by funneling its users from one game to the next, Zynga reduces the chances of a flop while also raising barriers that make it harder for new entrants to attract Zynga users. This strategy requires the timely release of new games to capture users as they become bored with old games (unlike traditional console games which are generally timed with the Christmas shopping season). Further, new users can be funneled to older games that still have enough active users to make the game enjoyable.

Zynga creates funnels between games through five distinct methods: in-game ads, Facebook ads targeted at existing Zynga users, email notifications, a product platform called the Z Bar, and a website called RewardVille. The first three methods are fairly straight forward, but the Z Bar and RewardVille are unique to Zynga. RewardVille is not a game, but rather a resource that allows users to gather coins, virtual goods and other prizes for multiple games at once. Figure 11 is a screenshot that illustrates how daily free rewards are available for most Zynga games on the RewardVille site. RewardVille helps expose existing players to other games, such as CastleVille, which was recently released and is prominently featured on the site. Unfortunately RewardVille's own user base, which had over 15 million MAUs shortly after launch, now only has about 4 million, so its ability to increase network effects is becoming negligible [68].

Figure 11: RewardVille screen capture



Source: rewards.zynga.com

The Z Bar, on the other hand, is displayed every time a user plays a Zynga game on Facebook (via a web browser) and is embedded in the page above the game. Figure 12 shows how the Z Bar allows the user to scroll through Zynga's entire product lineup in order to access new games or ones they already play. It displays notifications for new games (e.g., CastleVille) to encourage adoption, and it also displays alerts for previously played games, encouraging user retention between multiple titles. The result is that Zynga's games actually increase network effects amongst themselves, so an increase in MAUs for one game causes an increase in MAUs for others. The network effects shared between games will increase the time over which Zynga is dominant, but Zynga still needs to develop and release new

product in frequent intervals to prevent user decay. Project Z, on the other hand, potentially serves as a long-term platform between users and games.

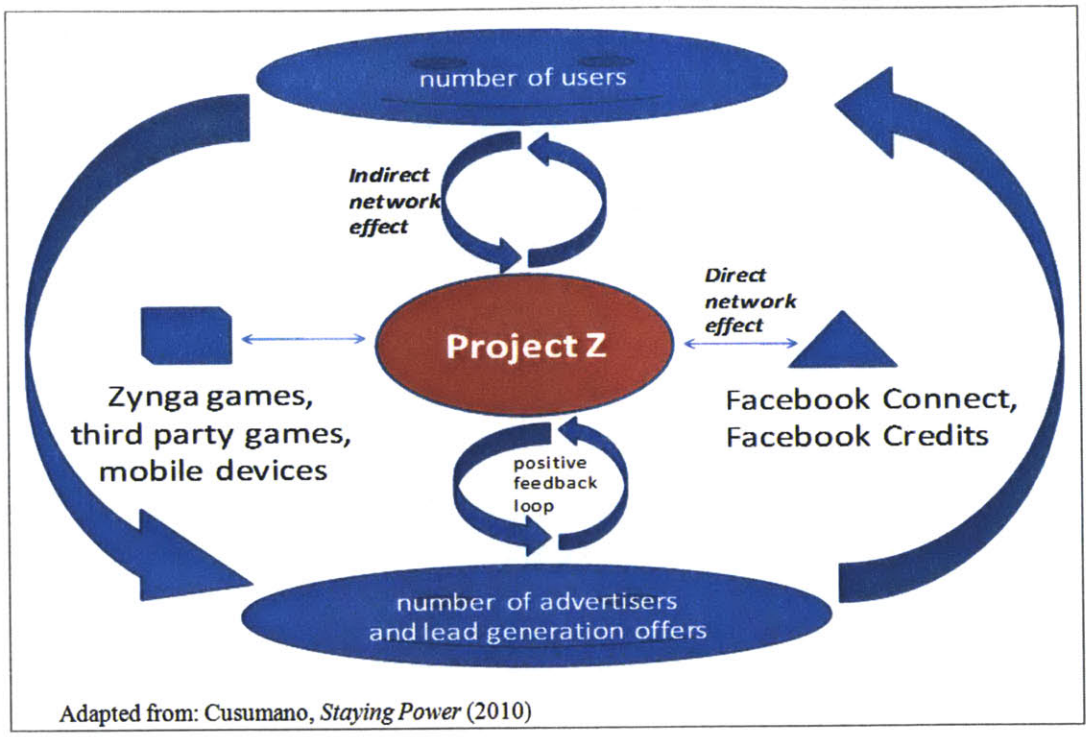
Figure 12: Z Bar screen capture

Source: Facebook.com/FarmVille

While Project Z is a potential competitor against Facebook, it will have special features for the niche gaming market that may differentiate it enough for people to use it in addition to their Facebook accounts. Perhaps the most notable differentiating factor is the idea that a Project Z user will have a distinct network of friends that includes people they have only met in online games. This would make Project Z similar to LinkedIn, which also serves a niche community (business professionals) and creates a distinct social network apart from Facebook. Even though Facebook is dominating the market, LinkedIn has been thriving in the business niche, suggesting that Project Z may be able to thrive in the gaming niche. It is unclear, however, how Project Z's reliance on Facebook Connect will affect Zynga's relationship with Facebook. Zynga is essentially creating a second social network within Facebook's ecosystem, which will reduce the amount of time users spend on Facebook's own pages (reducing Facebook's ad revenue). On the other hand, Project Z presumably still relies on Facebook Credits, so Facebook will continue to benefit from the sale of virtual goods. If the situation were to become too lopsided in favor of Zynga, however, Facebook would likely seek to alter the terms of their relationship.

While Zynga's competitors may try to create their own niche social networks, Project Z will benefit from Zynga's industry leading numbers of active users, which create significant network effects. Multi-homing would be possible since these platforms are typically free, but if Zynga can attract enough active users it will be difficult for a new entrant to steal the market away. For instance, Google has tried to take market share away from Facebook with Google Plus, a similarly-designed social network, but despite having millions of users register for the service, few of them are active on it [69]. Facebook's continued success suggests that the network effects seen in social networks can be so powerful as to overcome multi-homing issues. The question is whether Project Z can attract enough active users in the first place. Figure 13 shows the potential for Project Z to become the center of Zynga's ecosystem, with both Zynga's games and third party games providing direct network effects. Unlike the current ecosystem (previously seen in Figure 6), in which the user base is maintained by frequent product releases (putting high stress on product development teams), Project Z can maintain the user base by leveraging both Zynga games and third party games. By using this strategy, Zynga can become less dependent on the success and lifecycle of its games.

Figure 13: Zynga's potential ecosystem with the Project Z social network



Adapted from: Cusumano, *Staying Power* (2010)

Although Project Z is a compelling opportunity for Zynga, the remaining sections of this chapter focus more on games since they are Zynga's core business. The concepts discussed—hybrid products/services and product stickiness—could easily be applied to Project Z, but this would require significant speculation since the social network is still in development. Further discussion on how certain social media principles can be applied to Project Z's development and release can be found in Chapter 5.

Products, services or both?

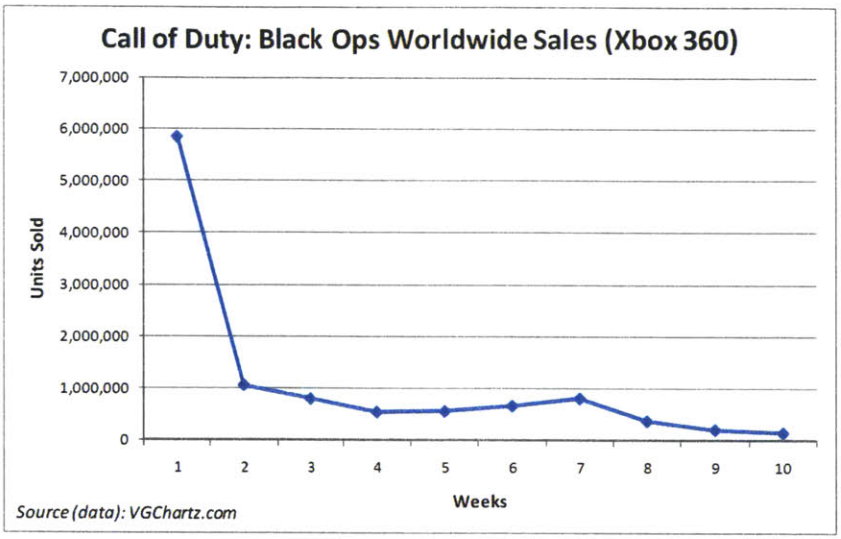
Cusumano made the case that "the companies with the highest sales productivity and profit rates—Microsoft and Adobe—sell mainly products rather than services," but he also points out that "when times are bad for new product sales, software companies are left with [lower margin] services-oriented revenues or maintenance" [56, pp. 36-37]. As a result, hybrid companies that have both products and services are poised to capture high profit margins while being protected against market downturns. While this concept was originally derived from and applied to traditional software companies, it is relevant for web-oriented companies as well.

Software that is delivered via the Internet can benefit from a significant amount of automation, resulting in a different type of hybrid business that Cusumano has termed a "servitized product" and/or a "productized service." For instance, Google's AdWords is essentially a service for placing online advertisements, but it is capable of more product-like gross margins because it is automated (as evidenced by the comparison of gross margins shown in Chapter 2). Meanwhile SAAS companies, such as Salesforce and HubSpot, generally offer servitized products that forego high license fees for smaller, but more frequent payments over the lifetime of each customer. As a result, their revenues over time

are generally more stable than a traditional products company, particularly during market slumps. In gaming, newer firms like Zynga, which also spread revenue over user lifetime, fall more into this servitized product category, while traditional game developers rely on a more typical product model.

Console video games make most of their money in the first weeks or even days following their initial release. Figure 14 below shows the unit sales for *Call of Duty: Black Ops'* first 10 weeks of release, which is a good proxy for the behavior of revenues because all payments are made up-front [70]. The graph suggests that revenues for this game were extremely high upon initial release and fell sharply (by roughly 80%) the following week. By week 10 the sales became relatively inconsequential. This pattern of behavior makes console games akin to typical entertainment products, such as blockbuster movies, in which success is determined by the immediate sales.

Figure 14: Unit sales for Call of Duty: Black Ops

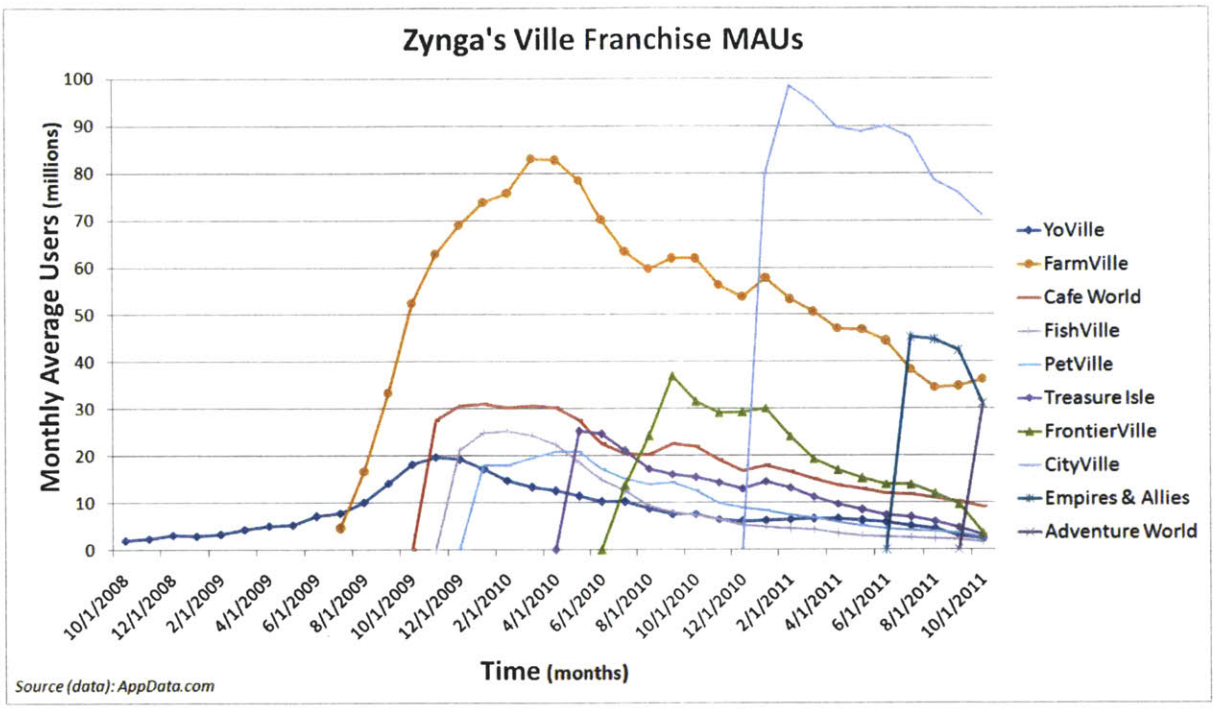


However, an interesting exception is found when comparing Activision's *Guitar Hero* and Harmonix's *Rock Band*. It is notable that Harmonix treated its game as a "music platform" rather than a product by developing an in-game storefront through which additional content can be purchased (namely individual songs) [71]. When sales for the music game genre collapsed, Activision cancelled future development on *Guitar Hero*, and while the next *Rock Band* installment was also shelved, the game's "downloadable content sales are soaring" [72]. Harmonix announced that more than 100 million songs have been downloaded through its storefront since it was opened in 2007 (actual revenues not reported). The sustenance Harmonix has received from its online storefront service during this market downturn supports Cusumano's suggestion that a products-oriented business can be sustained by services (in this case a servitized product) when demand for new product falls. While this more sustained pattern of sales behavior is unusual for console gaming, it is common for social-casual games.

Facebook game developers earn revenues over the lifetime of their users by treating the game as a platform through which to sell virtual goods and display ads. As a result, the activity of users over time is a better proxy for the behavior of revenues than the adoption rate. Figure 15 below illustrates

this behavior for each of Zynga's Ville games by graphing the number of monthly average users (MAU) over the past three years. Unlike console games, which make most of their revenues upon initial release, this data suggests that the peak revenues for social-casual games can potentially occur several months after release. However, it is also notable that the time between a Zynga game's release and its highest MAU is becoming much shorter, from 14 months for *YoVille* and 9 months for *FarmVille*, to just 2 months for *CityVille* and 1 month for *Empires & Allies*. Judging by this gradual decrease across games, it is likely that Zynga has been experiencing some learning curve effects for more efficient game launches, as well as spending more on advertising.

Figure 15: MAU levels across many Zynga games



The other aspect of this behavior is that after the MAUs reach their peak, they fall much more gradually than would a console game, meaning that revenues will remain significant over longer lengths of time (although this is partially sustained by the underlying growth of Facebook, discussed in Chapter 4). This makes social-casual games conceptually similar to certain online platforms, such as Amazon and Netflix, which are able to capture long tail sales. Developers should strive to maintain this tail for as long as possible since it provides a steady source of income without the risks associated with a new product launch.

The sticky factor

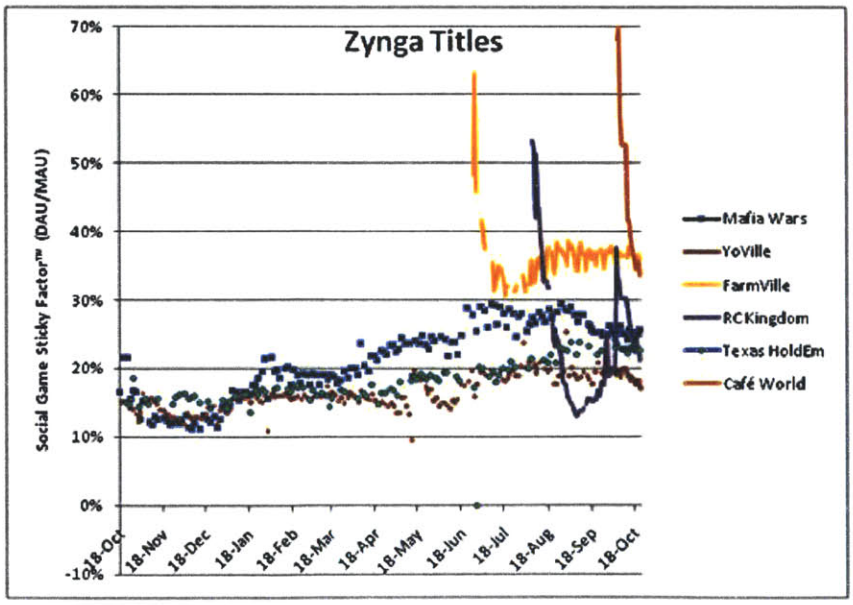
In his bestselling book *The Tipping Point*, Malcolm Gladwell popularized the use of the term "stickiness" to describe products, services and ideas that have a lasting impact and figuratively stick in one's memory [73, p. 25]. The book itself contains many concepts that are applicable to viral marketing, but Gladwell specifically discusses stickiness as an attribute that promotes adoption. More recently,

however, the phrase "the sticky factor" has been co-opted by some social media and social games businesses to help explain the churn of users over time. In these cases, the sticky factor is measured and expressed as the percentage of active users who interact with the platform on a frequent basis.

Many social businesses are interested in the frequency of interactions because it is an indicator of churn. When users have fewer interactions, they are more likely to stop using the platform. This is one of the reasons Facebook boasts that "more than 50% of our active users log on to Facebook in any given day," suggesting that their user retention is high [74]. For Facebook games, however, the frequency of interactions also indicates the health of virtual goods sales. A Zynga rep informed me that they have the most success converting users to paying customers when they play a game every day, and as a result the company concentrates its efforts on selling to this segment of users. When a user has not logged into a game for just one week, it is presumed that he/she will never make a purchase.

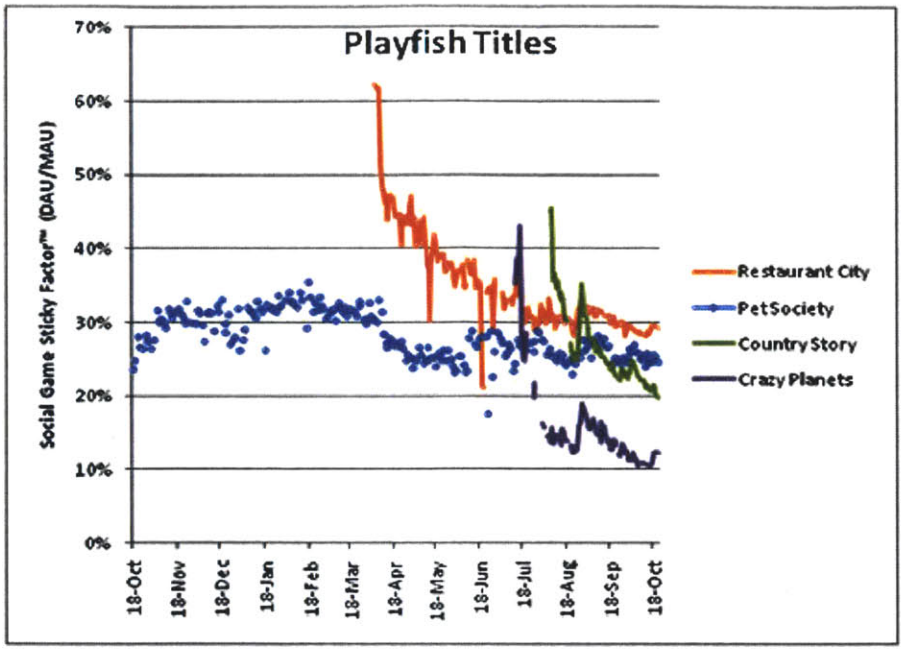
For social-casual games, the sticky factor is typically determined as the percentage of monthly average users who play every day (expressed as DAU/MAU) [75]. It is in a developer's best interest to have a relatively high DAU/MAU in order to decrease churn and increase revenues from virtual goods. Figure 16 and Figure 17 show the sticky factors for several games by developers Zynga and Electronic Arts' Playfish, respectively. For most of the titles, the DAU/MAU ranges between 10-40% with a high concentration between 20-30%—probably a good benchmark for social-casual games even though it is well below Facebook's. It is also typical for new games to start with a very high DAU/MAU, but this tends to be inaccurate as a result of both early growth and the lack of churn from previous months. The sticky factor rapidly falls from these initial peaks and generally reaches a more stable level after the first month.

Figure 16: The sticky factor (DAU/MAU) for Zynga games



Source: insidesocialgames.com

Figure 17: The sticky factor (DAU/MAU) for Playfish games

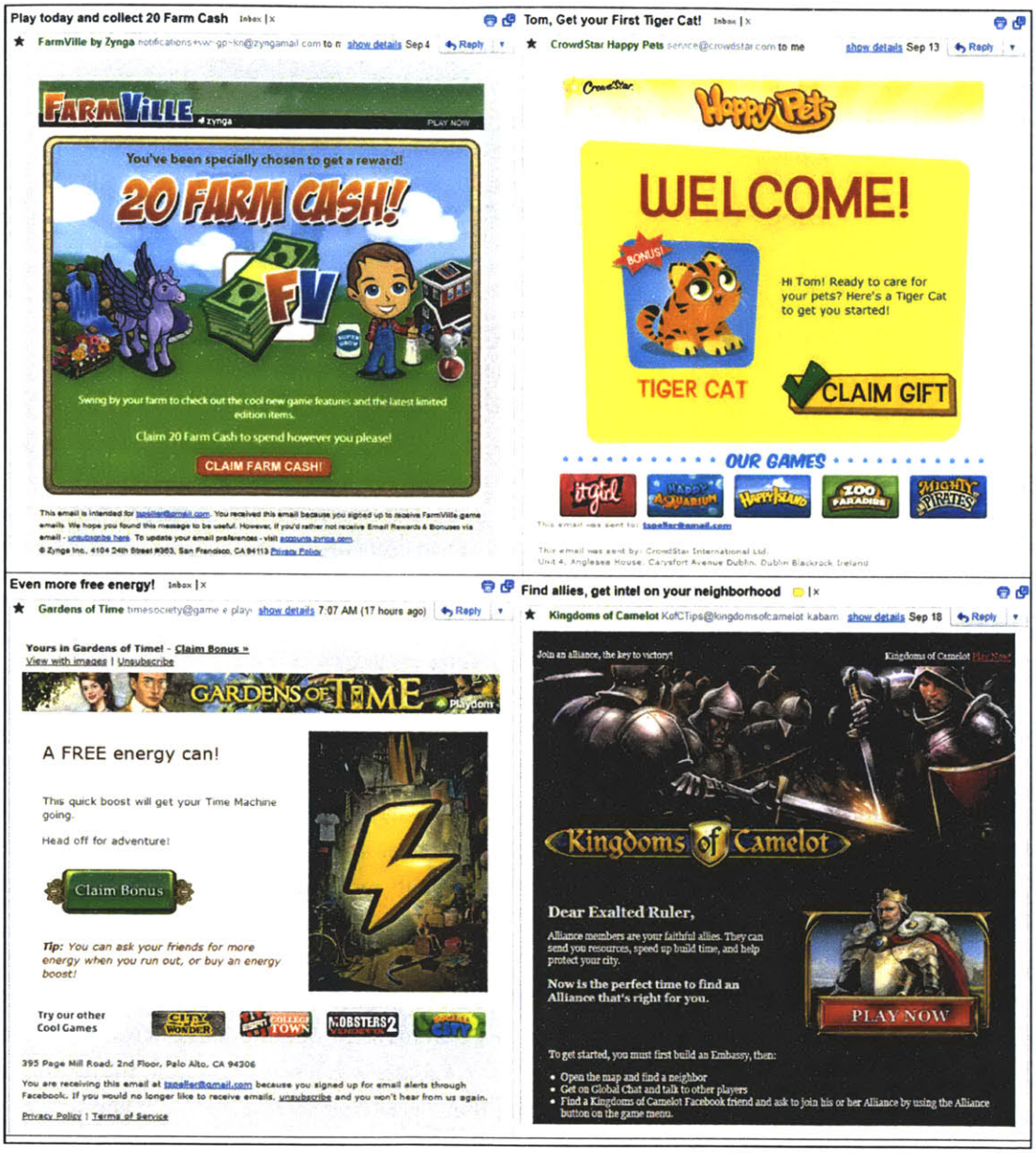


Source: insidesocialgames.com

There are multiple methods to increase the sticky factor, but for social-casual games most companies appear to rely on three key areas: game design, marketing, and content. In game design, Zynga has popularized the use of time delays, in which certain user actions may not pay off until several hours later (e.g., a crop planted in *FarmVille* will not be ready for harvest until the next day). As a result, the user must return to the game at a later time in order to retrieve their benefits, at which point they have the opportunity to make additional time-delayed actions. In this type of design, every time a user quits, they will potentially have a reason to return in the near future. The caveat is that changing a game's design can also affect how fun it is to play, and arbitrarily forcing a feature into a product simply to make it stickier can appear gimmicky if it does not fit the context. In real life, crops take many months to grow, so there is an underlying logic when a farming game makes the user wait for virtual crops to grow, even though they are just bits of data that could be transformed instantly.

Marketing is also used to increase the sticky factor by sending advertising reminders and special offers. Much the same way Coca-Cola buys TV ads and billboards to keep existing customers buying their product, Zynga places Facebook ads on existing customers' pages to remind them to play a game. Developers with large portfolios can also place advertising reminders across games in order to keep users playing more than one of them. Many firms also send email reminders often containing special offers. While testing several different Facebook games, I found that Zynga appears to do this more aggressively than its competitors, sending reminders for multiple titles as well as free "City Cash" for *CityVille* and free chips for *Zynga Poker*. Similarly, Disney's Playdom has sent several "free energy" offers for *Gardens of Time*, while CrowdStar sent a special pet offer for *Happy Pets*. Figure 18 below shows several examples of these messages.

Figure 18: E-mail reminders used to increase user retention



Content updates are another important feature that can increase the sticky factor for media in general. For instance, the inbound marketing pioneer HubSpot has found revealing correlations between the frequency of online blog posts and the probability of customer acquisition (shown below in Figure 19) [76]. While HubSpot's data does not describe the customer retention rates that characterize the sticky factor over time, there are some intuitive examples from other forms of media. *The New York Times*, for example, is able to sell daily subscriptions because they publish new content every day. Similarly, a popular TV show maintains a weekly audience because they air new episodes every week. In social-casual games, new content items (e.g., a new crop to plant in *FarmVille*) are added on a daily basis, and they are put 'at surface level' (meaning they are visible to the user) to grab the user's

attention. For particularly successful games, much larger content updates called expansions (with many new items, settings and rules) may be released, which significantly increase the depth of the game. An interesting example of new content as it relates to stickiness can be found in traditional console games as well.

Figure 19: HubSpot data on the relationship of blog frequency and customer acquisition

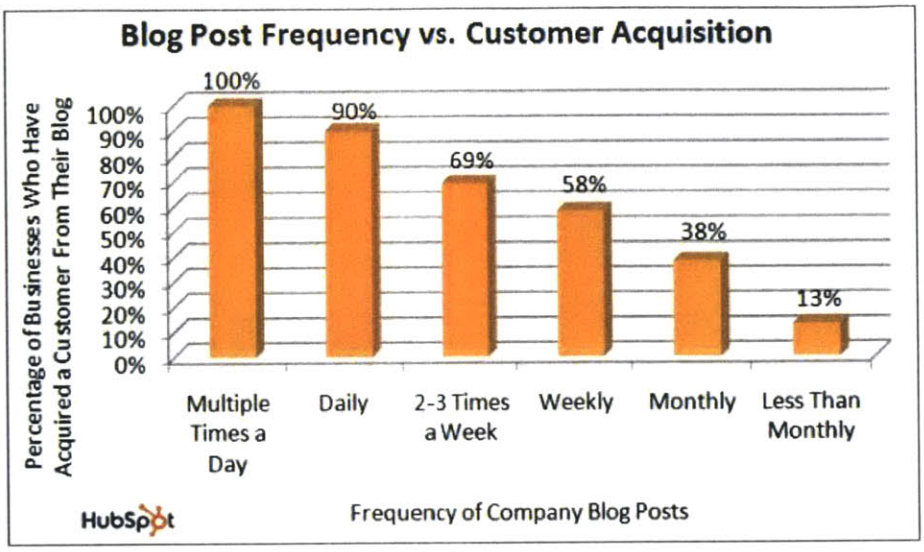
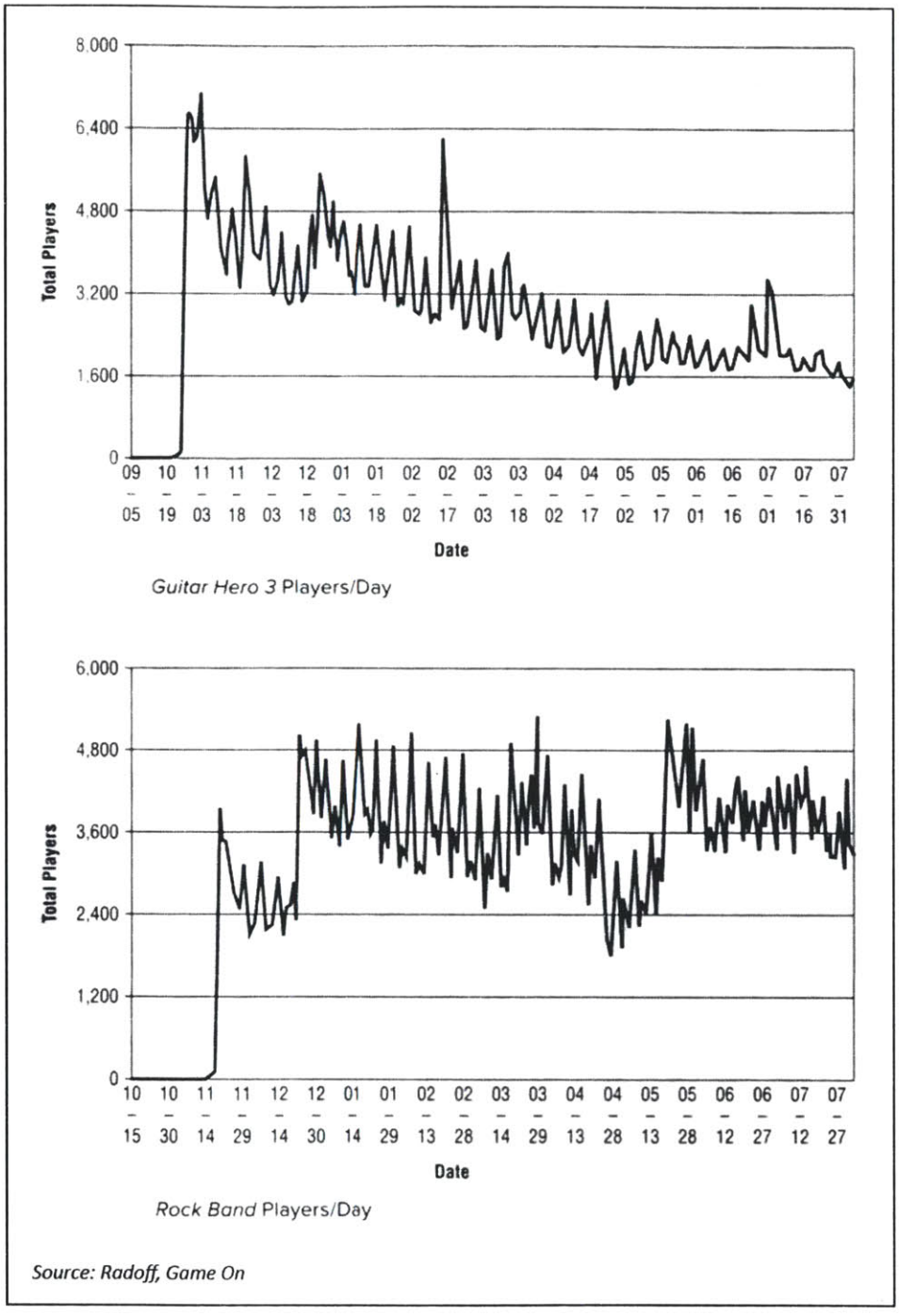


Figure 20 below compares the daily player activity of Activision's *Guitar Hero III* and Harmonix's *Rock Band* following their releases in the 2007 fall shopping season. Even though *Guitar Hero III* came out first and sold more copies, its average player activity quickly fell below *Rock Band* over the next several months. During the observed period, *Rock Band's* player activity was never higher than *Guitar Hero's* peak, but it appears to have been much stickier given its more consistent activity levels. Social gaming entrepreneur Jon Radoff also pointed out that while "*Guitar Hero III* owners purchased new songs at the rate of one every 15 days ... *Rock Band* players were buying faster, at the rate of one song every 10.7 days," which seems to be explained by the fact that *Harmonix* "released new songs more often" [77, pp. 186-187]. This data supports the theory that more content updates increase stickiness. Radoff, however, suggests that *Rock Band's* longer-term success was also attributable to the addition of new peripheral devices (a drum set and microphone) that "increased social play," so it was actually a combination of both typical content updates and social-oriented content that increased the sticky factor.

Figure 20: The stickiness of *Guitar Hero 3* and *Rock Band*



Similarly, social-casual games benefit from a combination of typical game content updates and social content updates (e.g., friends may send in-game messages, virtual gifts or perform other shared actions). The social content can be extremely powerful since social interactions often prompt immediate responses, which can be in the form of written replies or in-game actions (e.g., someone may harvest a friend's crops in *FarmVille* because they were sent a gift). Certain games, such as the Scrabble-clone

Words with Friends, have no game content updates and completely rely on social updates to remain sticky.

It should be noted that most successful games are using a mix of these methods and that there is no 'silver bullet' to success. Furthermore, Zynga Boston's Director of Product Development informed me that they continually optimize their games over the entire lifecycle, meaning that the best timing of reminders and content updates will change over time. One reason this may happen is that learning curve effects can cause users to consume new content faster. For example, Blizzard Entertainment president Michael Morhaime suggested that an increasing churn rate for *World of Warcraft* was the result of players becoming "much better and much faster at consuming content," and in response the company is "looking to decrease the amount of time between expansions" (expansions are significant additions of new content) [78].

In summary, the sticky factor (DAU/MAU) is an indicator of a user's engagement over a period of time, which can help explain why a churn rate is high or low. By using marketing methods and increasing game and social content, a developer can attempt to increase the sticky factor, but since the user base is dynamic, the optimal timing of these methods is not constant. On a final note, a Forrester analyst found that many firms using social media metrics often rely too much on measuring engagement and ignore other metrics that better suit their actual objectives [79]. As a result, game developers should also be cautious to not rely too much on the sticky factor or any other single metric for decision making. While the sticky factor may be useful in determining engagement, the execution of a successful product management strategy also relies on key information regarding adoption rates, churn rates, and conversion rates.

Chapter 4: Using System Dynamics to evaluate long-term policies

This chapter will use System Dynamics to model the number of active users for *FarmVille*, one of Zynga's most successful products, in order to gain deeper insight into its lifecycle and the potential implications on business policy and strategy. Some familiarity with System Dynamics is presumed, but the methodology and several characteristics of the active user model rely on John Sterman's *Business Dynamics*, which may be used for further reference. The following sections discuss many of the important features of the model, and Appendix A contains a full diagram and detailed documentation for each variable. Before developing a System Dynamics model, however, it is important to consider why System Dynamics is applicable.

System Dynamics helps guide policy and strategy for complex systems that have feedback loops causing changes over time. By itself, *FarmVille* may not be a complex product, but it has developed a complex ecosystem in which it leverages Facebook and word of mouth to create one of the most widely played online games of all time. Word of mouth acts as a powerful feedback loop that drives a significant portion of adoption. The nature of the virtual goods business also depends on sustaining a large number of active users over time, and since video games have traditionally had short life cycles, product management becomes a dynamic problem. The rapid growth of Facebook has made it even more dynamic by increasing the number of potential *FarmVille* users with each new person that joins the social network.

To model a dynamic problem, Sterman has outlined five key steps that form the structure of this chapter. The first step is problem articulation, in which the boundaries of the problem are defined. This is followed by the formulation of a dynamic hypothesis, in which important concepts and mental models are visually mapped. Then the simulation model is formed by inserting relevant inputs and equations to the mental models, after which testing is performed to compare the model's behavior with the mental model (later referred to as the reference mode). Finally, policies and strategies can be designed or reformulated based on insights from the simulations. Of course the model and policies become refined through iteration.

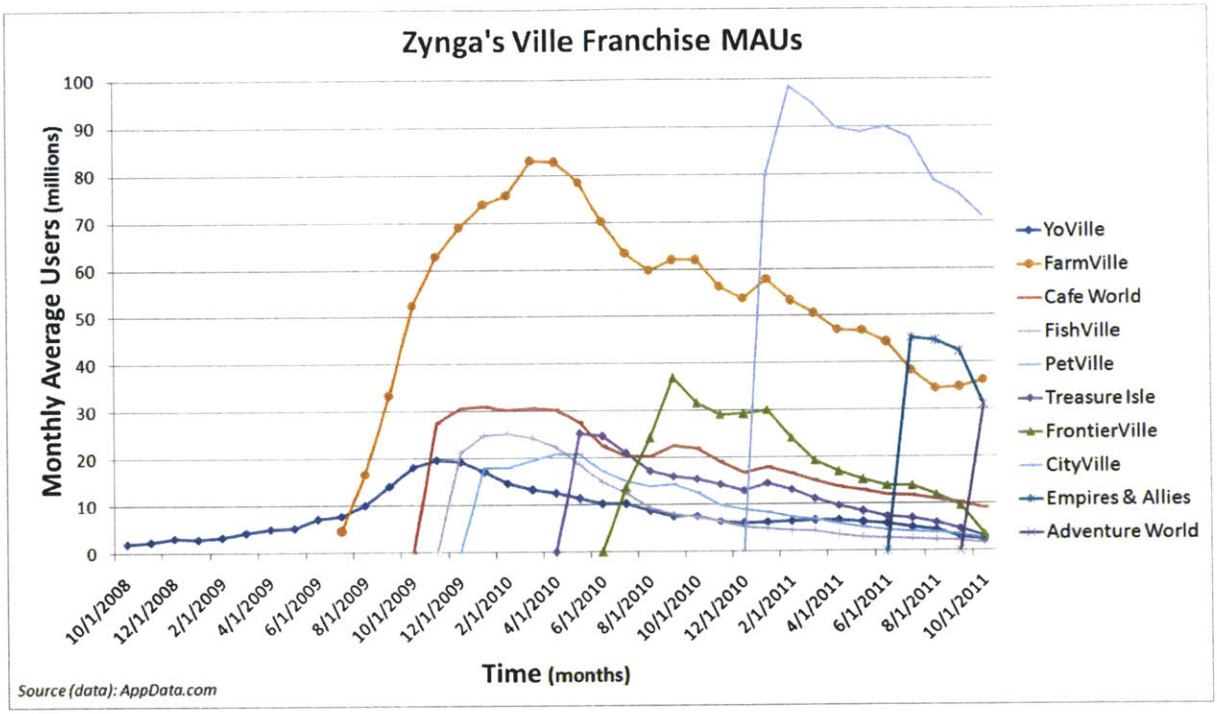
Some of the data used in this chapter relies on blogs, interviews and other material found on the Internet; however, many of the inputs used in the System Dynamics model (as well as the model itself) have been confirmed as realistic by Zynga Boston's Director of Product Development. During my visit with Zynga, I noticed that there was a heavy focus on daily average users (DAUs) because they are easier to monetize. The following sections, however, will focus on monthly average users (MAUs) since they have a larger contribution to word of mouth, which is a key component of the model. The model could be expanded to include DAUs (using the sticky factor previously discussed in Chapter 3), but this is outside the scope of the problem.

Problem articulation

While Zynga has an excellent understanding of short-term user activity, they are uncertain of what the long-term lifecycle of their most successful games will be. This is because the market for social-casual games is so new that no precedent has been set. As we have seen in Figure 21 below, the user activity for Zynga's games generally resembles a lognormal distribution, and some of the modestly

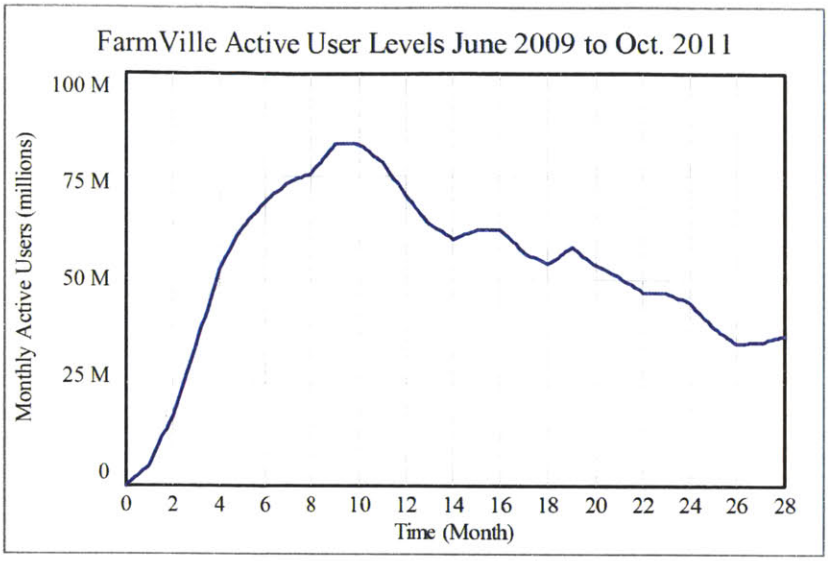
successful titles appear to be nearing end-of-life (zero users). However, *FarmVille* and *CityVille* have achieved much higher MAU peaks and still have so many users that it is unclear how long the games will last and whether they will maintain the lognormal behavior. This uncertainty makes it harder for a firm with competing projects to plan reinvestment (via major content expansions) and new product development. For this analysis, I have chosen to focus on the lifecycle of *FarmVille* because it was the first highly successful social-casual game, and as a result there is more available data.

Figure 21: MAU levels across many Zynga games



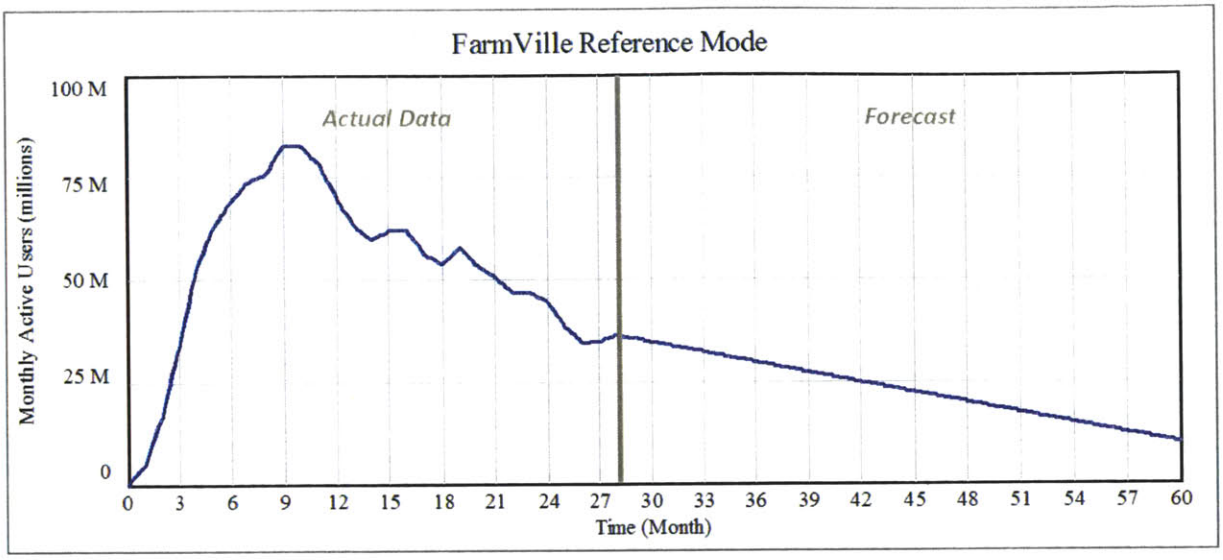
The key variables to consider as part of this problem include advertising, word of mouth, average duration of a user, and the underlying growth of Facebook. Advertising creates *FarmVille's* initial core group of users, while word of mouth drives its long-term adoption. The average duration of a user also has an effect on adoption because the contribution to word of mouth increases the longer a user stays active. The growth of Facebook is a more subtle aspect of the problem because it increases the total market for the game over time. Figure 22 shows *FarmVille's* active user data for its first 28 months following release, but how far into the future will *FarmVille* last, and will a significant reinvestment late in the game's lifecycle be financially viable [67]? This leads to the question, over what time horizon should the System Dynamics model be simulated?

Figure 22: FarmVille's MAU levels 2009-2011



There are several indications that the lifecycle of traditional console video games is relatively short. *Stanford Business Magazine* suggested that the majority of sales for a console game may occur within "only six weeks" following release [80]? Jason Kraft and Chris Kwak of the Susquehanna Financial Group found that roughly 85% of lifetime sales occur within the first year of release [81]. In VGChartz's current ranking of the top 50 weekly game sales, only five titles have been available for more than a year (it is notable that the longer selling titles tend to be for the Nintendo Wii, which generally features more elements of social-casual game design) [82]. Given these observations it appears that the full lifecycle for a typical console game is two years or less (not including development time). Meanwhile, *FarmVille* is just over two years old and still has nearly 40 million monthly average users (after peaking at 80 million in its first year), so its lifecycle is clearly longer than a console game. Given its gradual decline, it appears likely that *FarmVille* will fall below the 10 million mark between years four and five, at which point the game will continue to subsist, but as a relatively unimportant member of Zynga's product portfolio. Figure 23 below shows the reference mode for this behavior (using a linear forecast for simplicity), which will be compared to the System Dynamics simulations. Since there is no historical data for a game with such strong network effects, the likelihood of the reference mode is unknown. In the following sections, the System Dynamics model is constructed to test whether this hypothesized behavior holds true, using 60 months (five years) as the time horizon. Additionally, two forecasts of Facebook's underlying growth are used as the basis for a sensitivity test, and a late stage reinvestment is introduced to ascertain its potential benefits.

Figure 23: System Dynamics reference mode



Formulation of dynamic hypothesis

The dynamic hypothesis is the set of stocks, flows and causal behaviors that are believed to produce the growth and decline of *FarmVille's* user activity levels. In a system dynamics model, these behaviors are visually mapped and become the basis for a set of numerical inputs and equations that are used to simulate the model. While certain problems may require a model to be developed from scratch, Sterman's *Business Dynamics* provides two key examples on which to base a model of user activity: the Bass diffusion model and a viral epidemic model.

The Bass diffusion model (see Figure 24 below) captures the idea that for a typical product there is a set of *potential adopters* who become *adopters* through the forces of advertising and word of mouth [83, pp. 332-335]. The *adoption rate* is initiated by an advertising campaign, which creates a core set of adopters that then contribute to word of mouth. *Word of mouth* is considered a reinforcing loop because an increase in adoption rate causes an increase in adopters, which further increases the adoption rate. On the other hand, *market saturation* from both advertising and word of mouth are balancing loops because an increase in adoption rate causes a decrease in potential adopters, which in turn decreases the adoption rate. Simulations of this model produce a classic S-curve when graphing the number of adopters over time, but for social-casual games we want to see a lognormal curve, which suggests that the model is incomplete. A key characteristic that is missing is the idea that word of mouth occurs predominantly within the game itself (via electronic invites), so only users that are actively participating will have a positive effect on the adoption rate. This is where the epidemic model is incorporated.

Figure 24: Bass diffusion model

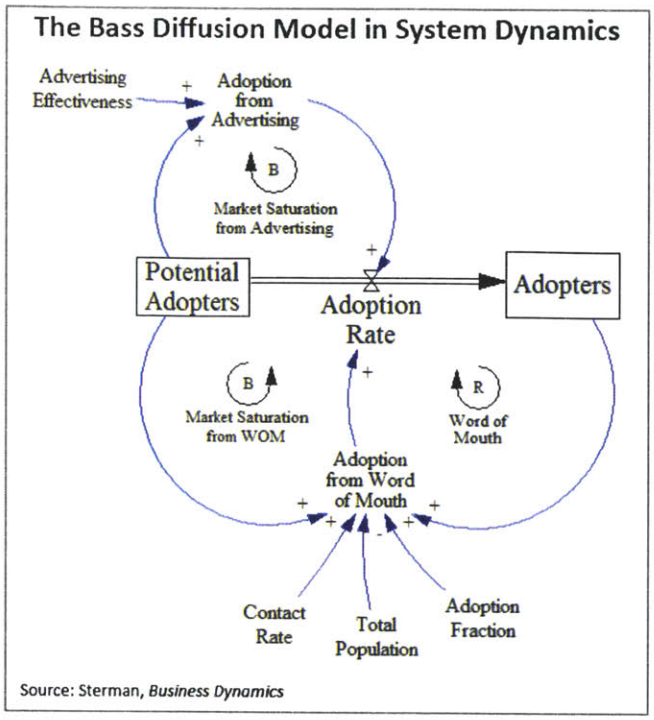


Figure 25 illustrates an epidemic in which a susceptible population can become infected by a virus, during which time they spread the virus to others, and after a while they recover and stop spreading it [83, pp. 300-305]. The *contagion* and *depletion* loops are analogous to the *word of mouth* and *market saturation from WOM* loops in the Bass model, respectively. The key difference is the *recovery rate* because people that recover are no longer spreading the virus (creating a balancing *recovery* loop that counteracts the reinforcing contagion loop). This concept is very similar to the behavior in social-casual games where active users primarily contribute to word of mouth and inactive users do not. Further, this model produces a lognormal behavior for the actively infected population. The only issue with the epidemic model is that when no one is infected (or when there are no active users) there is no mechanism to start the contagion loop (or the word of mouth loop). The advertising loop overcomes this problem. By combining the structure of the Bass diffusion model with the epidemic model, we can more accurately describe the behavior of *FarmVille*.

Figure 25: Viral epidemic model

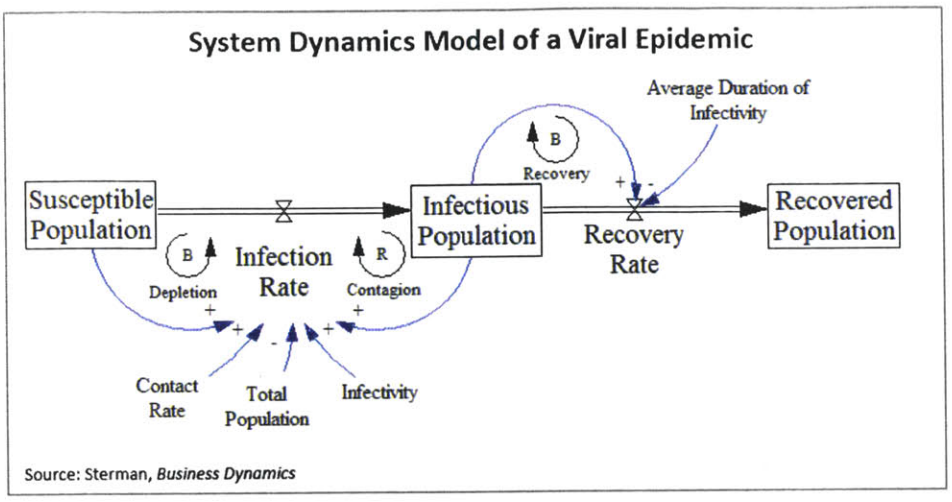
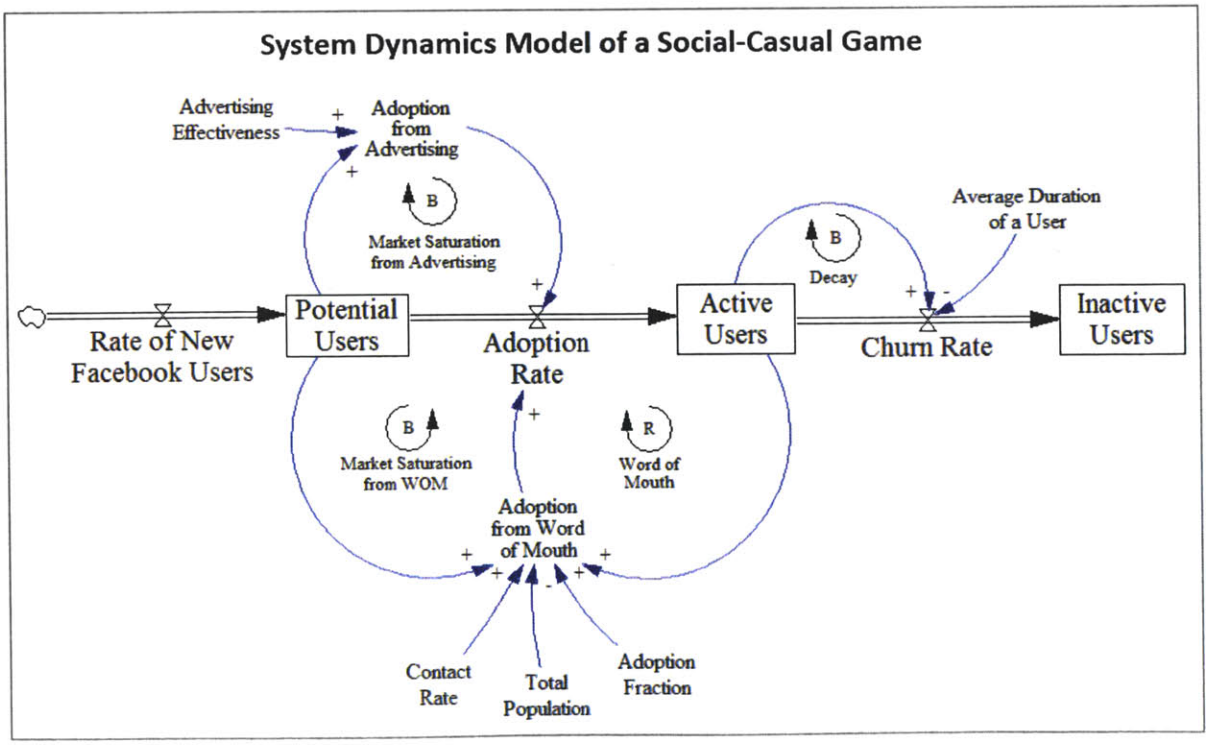


Figure 26 shows how the models are combined to capture the user behavior of a typical social-casual game. Some of the terminology for the stocks and flows has been adjusted to reflect those common to social media, but the structure mirrors the Bass and epidemic models. The only entirely new addition is the *rate of new Facebook users*, which is an important variable since it has been rapidly increasing the *total population* to which Zynga and other third party developers can market their product.

Figure 26: Model of a social-casual game



It is important to note that no model is perfect and while this one is further developed in the following section, it will never be complete or 100% accurate. For example, I have intentionally omitted a reactivation loop in which inactive users become active again. In reality this does happen, but the number of users flowing through this loop is relatively small (developers primarily focus on reactivating paying users while many are funneled to new games), so adding it to the model would produce little effect and needlessly complicate the diagram. It is also important to remember that the model is merely an aid to enhance one's decision-making abilities under uncertainty. The simulations that follow produce a set of numerical results, but they are merely a guide for how the future may look under different scenarios and should not be taken as fact.

Formulation of a simulation model

Each of the variables in a System Dynamics model represents either a numerical input or an equation that is used to perform a computer simulation. This section discusses these variables in detail and calibrates the model to match the historical data for *FarmVille*. Note that the model will use months as the unit of time to reflect the notion of monthly average users, and that the 60-month time horizon is equivalent to five years. However, before the inputs are made some structural additions are required to more accurately capture the real world dynamics.

The *advertising effectiveness* variable in the Bass model is commonly criticized because it assumes a constant value [83, p. 341]. In reality, when a game launches it coincides with a substantial advertising expenditure that decreases over time. To capture this idea, Figure 27 shows a revised advertising loop, in which advertising effectiveness is a function of advertising expenditures being made over time. According to CEO Mark Pincus, Zynga spent $2 million to advertise *FarmVille* when it was released [84]. In the model, this figure is used as the basis for an advertising schedule that decreases from $2 million over the first six months to a much lower, but ongoing expense (see Figure 28) [85, p. 32]. Normally, the ongoing advertising expense consists of reinvestments in advertising from a game's profits, but since the impact from advertising is minimal after the initial launch, I am assuming it becomes a constant value to avoid complicating the model. The *ad success rate per dollar* variable signifies the number of users Zynga obtains for each advertising dollar it spends, and it is based on a $0.60 average cost to acquire one MAU for 2009. I have been told that, at present, the typical acquisition costs would range from $0.50 to $2.00 with the most expensive users in the target market (i.e., the ones most likely to pay for virtual goods), but at the time *FarmVille* was released, bidding on Facebook ads was less competitive. The model does not reflect the increase in advertising costs over time because the majority of expenses occurred in the first months following release so any effects would be negligible. If the model was used to test major reinvestments in advertising, it would be necessary to account for the increased bidding competition and to forecast future ad prices.

Figure 27: Changes to the advertising loop

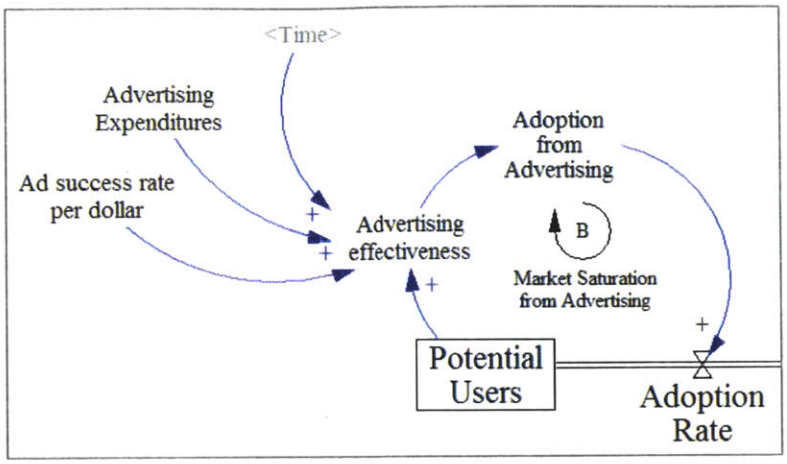
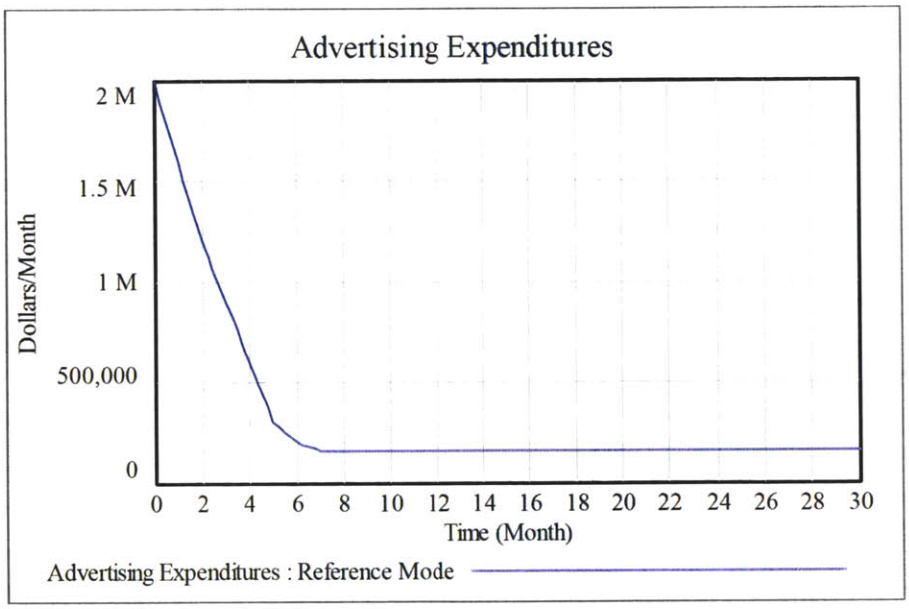
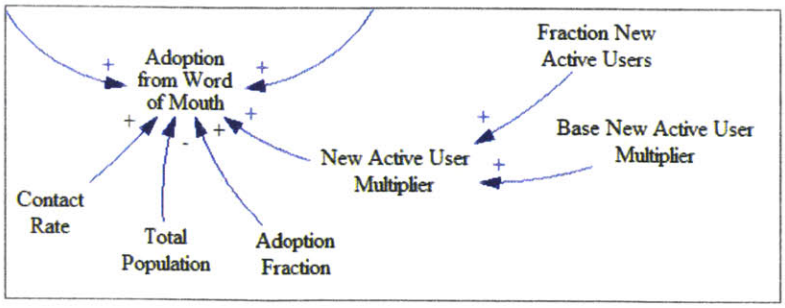


Figure 28: Pattern of advertising expenses



A second key addition to the model captures the idea that new users will have a stronger impact on word of mouth than older ones (the first time a new user joins a game they are encouraged to invite their friends). This is achieved by adding a 2X new active user multiplier, such that when all active users are new to the game, the *adoption from word of mouth* will be twice as high (see Figure 29). However, the multiplier decreases as the *fraction of new active users* decreases (*i.e.,* as active users become older). Many social-casual games are designed like this to encourage faster adoption.

Figure 29: Influence of new active users on word of mouth



Aside from the multiplier variable, adoption from word of mouth captures three concepts: the number of total contacts that potential users have (Potential Users*Contact Rate), the probability that a potential user makes contact with an active user (Active Users/Total Population), and the fraction of potential users who subsequently adopt the product. The resulting equation is:

(Potential Users*Contact Rate)*(Active Users/Total Population)*Adoption Fraction.

The contact rate is set to the average number of friend connections that each Facebook user has (about 130) [74]. The total population is simply equal to all of the potential, active, and inactive users added together. The adoption fraction is unknown, and in this case it is used to help scale the number of users to match the historical data. However, Chapter 2 pointed out that in May 2010 Facebook limited game developers' access to user notifications and requests, causing Zynga's user base to decrease by 10% [34]. Since these Facebook features had been key aspects in communicating the game to potential users, this decrease is incorporated into the adoption fraction variable by subtracting 10% of its value in month 10 (assuming that the loss is entirely attributable to lower adoption rates).

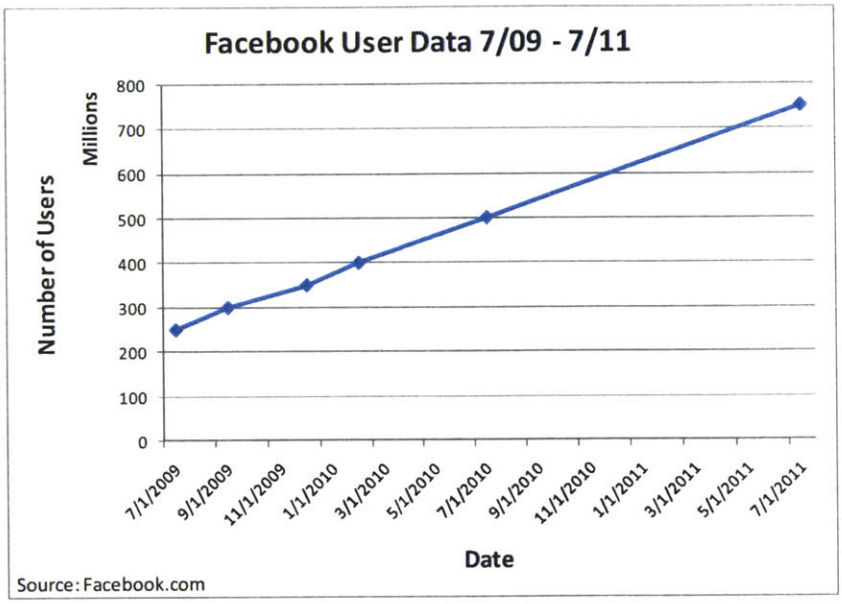
In System Dynamics, stocks are generally equal to the integral of their inflows minus their outflows over a given period, plus their initial value. In this case, the potential, active and inactive users are three stocks, while the adoption rate, churn rate and rate of new Facebook users are the flows between them. Table 6 shows the equations for each of these variables with the exception of rate of new Facebook users. The initial values A_0 and I_0 are both zero (technically there may have been beta users prior to launch, but in relatively insignificant numbers), while P_0 is set to the number of users on Facebook at the time *FarmVille* was launched.

Table 6: Formulas for stocks and flows

Stocks and Flows	Formula
Potential Users (P)	$\int$ (Rate of New Facebook Users-Adoption Rate) + P_0
Active Users (A)	$\int$ (Adoption Rate-Churn Rate) + A_0
Inactive Users (I)	$\int$ (Churn Rate) + I_0
Adoption Rate	Adoption from Advertising + Adoption from Word of Mouth
Churn Rate	Active Users / Average Duration of a User

Figure 30 shows the growth in Facebook users over the two years following *FarmVille's* release [86]. The initial population (P_0) is 250 million users, and in each subsequent year an additional 250 million join the social network. In the model, the *rate of new Facebook users* captures this growth by feeding in 500 new *potential users* over the first 24 months of the simulation. However, simulating beyond this period will require a forecast of Facebook's growth, which is discussed further in the next section of this chapter.

Figure 30: Facebook's growth 2009-2011

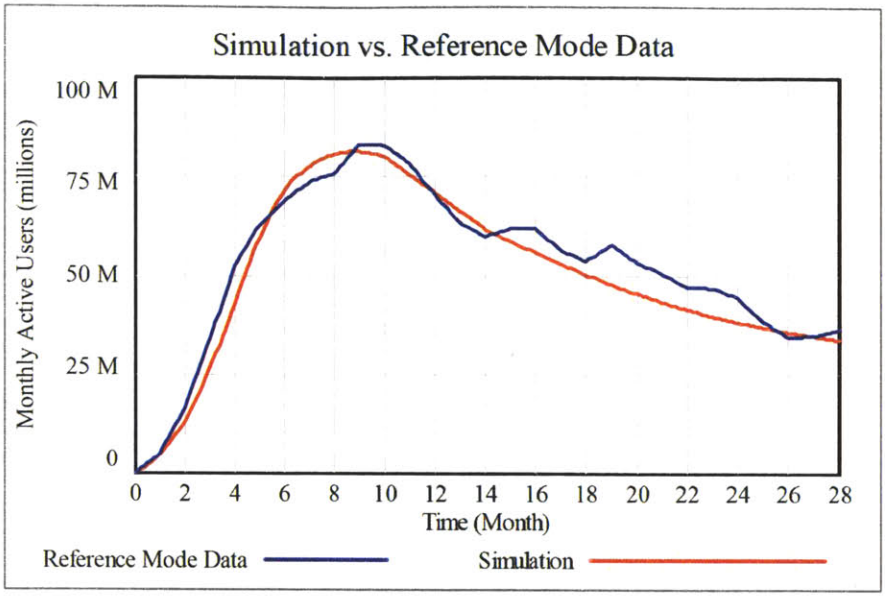


The final variable to set is the *average duration of a user*, which Playdom CEO John Pleasants stated is commonly three months for a successful game [25]. When I discussed this at Zynga, it was suggested to me that when a game is first launched there are a large number of 'one-timers' (users who play once and never return). As a result, the average duration of a user is lower during the launch period and increases as the *fraction of new active users* falls. This is achieved in the model by initializing the duration at two months and increasing it to three months over the first year. It is also important to note that roughly a year after its release, Zynga began introducing a major content expansion for *FarmVille* in order to increase user duration [64]. To incorporate this expansion into the model, I have set the variable to increase to 3.25 months at month 14 (at which point there is a noticeable change in the reference mode's behavior), a modest gain since new content is primarily consumed by daily average users who make up a smaller portion of overall users.

The model can now be simulated over the first 28 months of *FarmVille's* release, for which there is available data for Facebook's underlying growth. Figure 31 compares the simulation with the reference mode. The model produces a reasonable approximation of *FarmVille's* user activity levels to date. Some fluctuations are not represented in the simulation, but they do not appear to be caused by significantly different behaviors. The following section will expand the time horizon from 28 to 60

months in order to approximate *FarmVille's* future behavior and then incorporate a second major expansion later in the lifecycle to test its effects.

Figure 31: Comparison of simulation to reference mode data



Before moving on, there are some caveats to point out in the model and its inputs, primarily regarding the *advertising effectiveness* and *adoption fraction* variables. The model treats both of these variables as constants, but in reality they are also dynamic. At Zynga, I learned that advertising has become more costly over time as new competitors enter the space and bid on ads for the same users. Furthermore, advertising becomes less effective over time because many of the early adopters were 'low hanging fruit' that were easier to attract. However, the increasing cost is most relevant during product launches when major advertising expenses are made. While customer acquisition costs (primarily advertising expenses plus staff) continue over the lifetime of a game, their contribution to the number of active users is relatively small compared to word of mouth, and as a result, incorporating these dynamics into the model produce little effect.

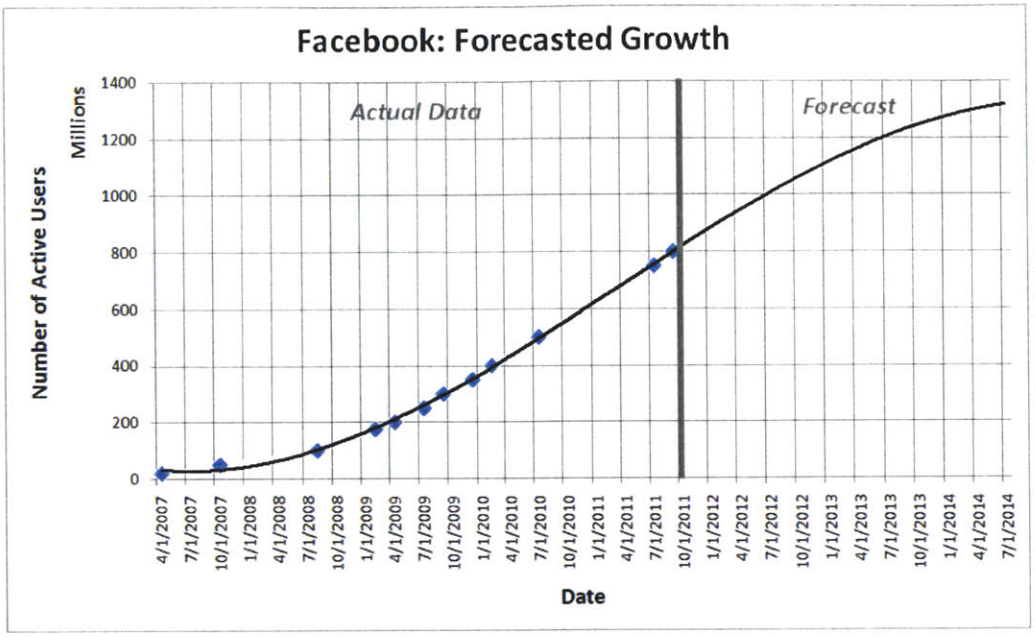
Changes in the adoption fraction can have much more substantial effects, but the adoption fraction itself is determined by the inherent appeal of the product. Since the product's appeal is set by more upstream activities (namely product design), there is little Zynga can do to affect it after the game is released. Certain 'exogenous' factors, such as increased competition or new changes to the Facebook platform can also affect the adoption fraction, but these problems are better understood since they have had more immediately measureable impacts on Zynga's games. The extent to which the growth of Facebook affects user activity is less obvious.

Testing

Before the model can simulate future periods, it is necessary to develop a projection of new Facebook users through mid-2014. While System Dynamics could also be used to model this problem, it is relatively easy to use an alternative approach because Facebook is expected to exhibit a more

predictable S-curve pattern of growth (due to a much longer average user duration). Figure 32 below uses Microsoft Excel to select a best fit S-curve using Facebook's published data [74] [86].

Figure 32: Forecast of Facebook's growth through mid-2014



However, Excel's projection may be seen as aggressive since it suggests Facebook's population will grow by another 60% in the next 2.75 years, approaching a fifth of the Earth's population. As a result, I have created Table 7, which contains both an 'Optimistic' and 'Pessimistic' forecast. The Optimistic forecast uses Excel's figures, while the Pessimistic forecast reduces these figures by 50%. These two scenarios are used as a sensitivity test in the System Dynamics model to judge whether it causes a substantial difference in *FarmVille's* user activity.

Table 7: Optimistic and pessimistic forecasts of Facebook's growth

Forecast: Number of Facebook Users		
Year (from July)	**Optimistic** (millions)	**Pessimistic** (millions)
2009	250	250
2010	500	500
2011	750	750
2012	975	862.5
2013	1180	965
2014	1290	1020

Figure 33 displays the five-year (60-month) simulations of *FarmVille* using both the optimistic and pessimistic scenarios. The curves prior to month 28 are identical because they both use the same

inputs, but after month 28 they quickly diverge. During the forecasted period, the number of active users in the optimistic scenario stabilizes, while in the pessimistic scenario it continues to fall. By the end of the simulation, the optimistic scenario still has roughly 31 million active users, while the pessimistic scenario only has about 14 million. This makes the pessimistic scenario similar to the reference mode (see Figure 34), although it is still a bit higher, which suggests the game will have a longer lifecycle than previously thought.

Figure 33: Simulations of *FarmVille's* MAU levels under optimistic and pessimistic conditions

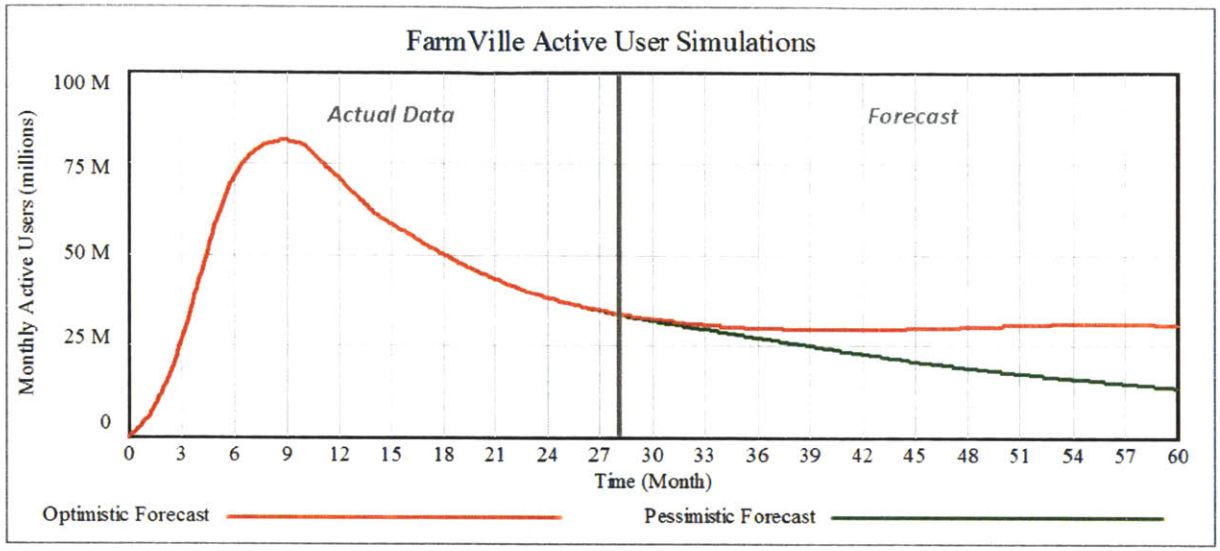
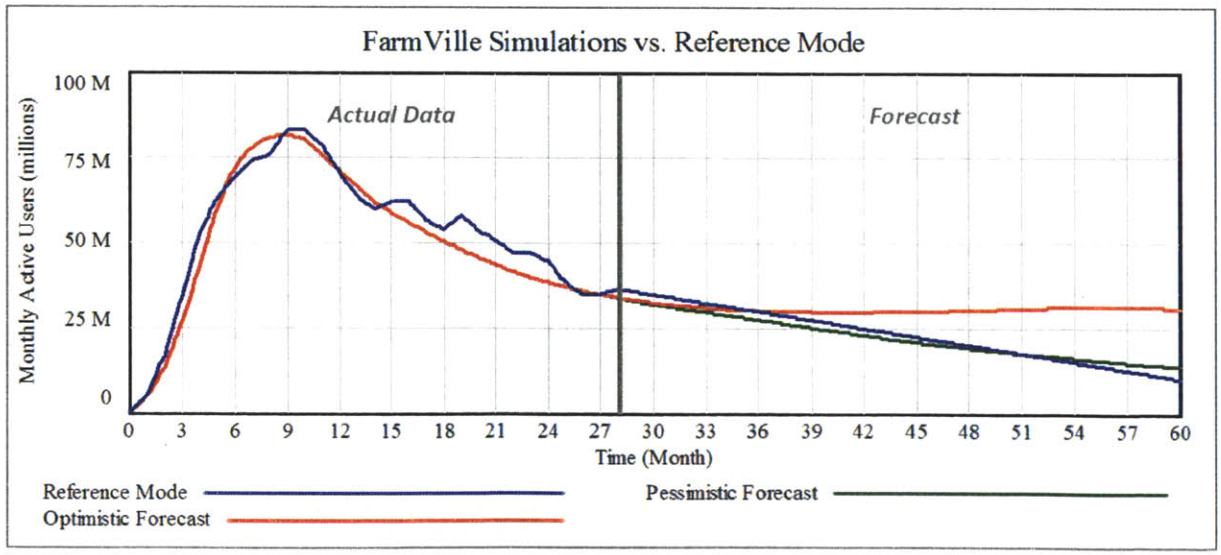


Figure 34: Comparison of simulations to the reference mode



Note that these scenarios require Zynga to maintain the same levels of user duration, adoption fraction, and to a lesser extent advertising effectiveness, during the forecasted period. One strategic option would be to simply maintain the course and hope for the optimistic scenario. On the other hand,

Zynga can try sustaining the game for a longer period by releasing a second major content expansion and further increasing the average duration of a user, but it is unclear how significant an effect this will have when the game is at a later stage in its lifecycle (particularly in the pessimistic scenario). To simulate this in the model, I have set the average user duration to increase to 3.5 months at month 40, providing a full year for development and testing. While many social-casual games can be designed in six months, this schedule takes into account the idea that users consume content more quickly (due to learning curve effects). The additional development time allows Zynga to add more features, although another option would be to release two content expansions six months apart (perhaps a better strategy since it starts increasing user duration sooner, but this is outside the scope of this chapter).

Figure 35: Simulations with second major content expansion

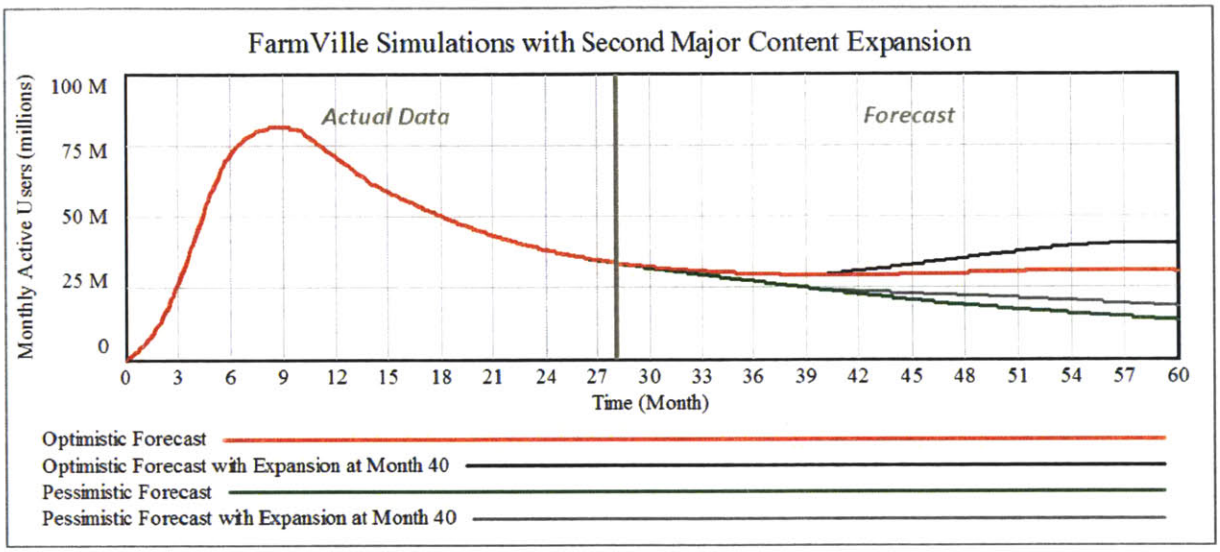


Figure 35 above shows that both the optimistic and pessimistic scenarios receive an increase in active users with the content expansion at month 40. In the optimistic scenario, the user activity level actually starts growing again, while in the pessimistic scenario it only reduces the rate of user decay. Further, the pessimistic scenario sees a noticeably smaller increase in users than the optimistic scenario, so it is unclear whether it is financially worthwhile. To judge the expansion in financial terms, I have implemented a conversion rate within the model that multiplies *active users* by *revenues per user per month* over the course of the simulation. The revenues per user per month variable is ascertained using Zynga's most recent S-1 filing, which states that *FarmVille* accounted for 27% of the $781.7 million in virtual goods revenue so far this year [87]. This equates to roughly 37.4 cents per user per month (based on an average 47 million MAUs over the period). The net increase in revenue is calculated by subtracting the development costs, which are modest. A social-casual game developed on a six-month schedule typically costs $200-400k, so for a 12-month schedule on a major game the costs can reach $1 million [88]. Content expansions benefit from having an underlying game platform, which reduces development costs (in technology and design), but I am assuming that any savings will go into creating additional content.

Table 8 below indicates that if Zynga maintains its conversion rate, the content expansion will have a net increase in revenue by between $24 and $44 million depending on Facebook's growth (easily overcoming development costs). This suggests that a major content expansion is a safe bet, even if Facebook's growth is lower than expected. However, the expansion only increases *FarmVille's* existing revenues by 9-12%. If its development team had been working on an entirely new game instead, there would have been the potential for much higher profits. This issue leads to the final section of this chapter, in which policy and strategy are discussed using the insights gained from simulation.

Table 8: Net revenue increase from the content expansion

	Number of Active Users at End of Year 5 (in millions)	Cumulative Revenue for Months 28-60 (in millions)	Net Increase (in millions)
Reference Mode	10	--	--
Pessimistic Scenario	13.65	$267	--
Pessimistic Scenario w/ Expansion at Month 40	18.52	$292	$24
Optimistic Scenario	30.68	$366	--
Optimistic Scenario w/ Expansion at Month 40	40.79	$411	$44

Policy design and evaluation

As Facebook continues to grow, Zynga and other third party developers are at a stage where short and long-term strategies may look significantly different. *FarmVille's* surprisingly long lifecycle is directly related to the rate of new Facebook users, but further below I show how this behavior changes when Facebook becomes mature. However, before this happens Zynga needs to plan its product management and product development for the next few years.

The first issue to think about is whether Zynga can actually achieve the active user levels predicted by the *FarmVille* simulation. Facebook's growth is increasingly international, and different cultures and languages may reduce *FarmVille's* adoption factor in those nations (although farming is a ubiquitous theme). Over 75% of Facebook's users are outside of the United States [74], but only 35% of Zynga's revenue currently comes from international sources [87]. Zynga's S-1 filing states that while the international market is a key growth strategy, it is also a growth risk because Zynga has "limited operating history as a company outside the United States," and as a result there are many unknowns [87]. However, one problem is that their games need to be translated as they cross borders. Facebook has been overcoming this partially by crowd sourcing, with 300,000 users contributing to the site's translations. Zynga could actually incentivize its users to do the same thing by paying them in virtual currency, creating free labor. The other motivating factor for Zynga to move internationally is that they will be one of the only game providers on Facebook with a worldwide presence, giving them a first mover advantage in new territories.

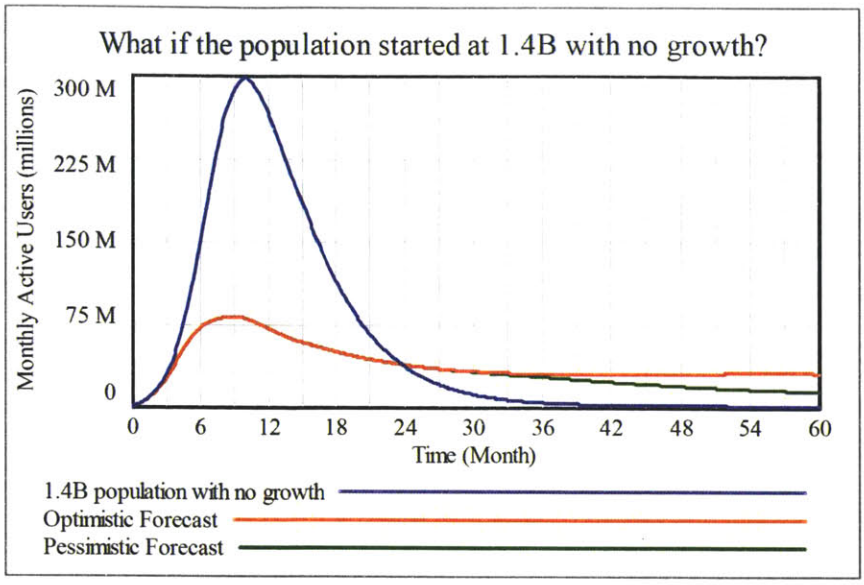
Assuming Zynga maintains user growth in foreign markets, should it invest in a major content expansion for FarmVille over three years after its release? The two key issues here are the rate of return and the maintainability of Zynga's user base. The simulation suggests that a $1 million reinvestment will return $25-45 million on top of a game that is already a proven success. This makes it a very safe bet, but only represents a 9-12% net increase over FarmVille's existing revenue. It may be in Zynga's best interests to shift these resources to new product development instead, where the company can achieve higher returns, but at significantly higher risk. This decision may be moot since Zynga has hundreds of millions available in cash reserves, but the company has limited staff even as it acquires additional developers. It is also notable that the advertising expenses required for a major game launch can be much higher than development costs, making it harder to compare these types of projects. Presumably, a much higher discount rate is used for evaluating new products than content expansions; however, finance is not the only problem to consider.

Zynga needs to funnel its decaying users to new product in order to maintain its ecosystem, but it has already released several new titles in the wake of FarmVille (most notably its successor CityVille). More important is the fact that FarmVille continues to be one of the most profitable Zynga titles, meaning it has more users paying larger amounts. Paying users are the most important subset of MAUs and also tend to be among the most dedicated users, but if Zynga does not provide them with new content they will eventually move on to other games. Thus maintaining FarmVille is also about maintaining paying users who may not spend as much time or money in other Zynga games. Until these users can be monetized more successfully throughout Zynga's ecosystem, it is wise to keep FarmVille going.

In the near future, however, Zynga will be thinking differently about the long-term behavior of its games. As Facebook matures, the number of potential game users becomes much higher, but it stops growing. This will increase adoption for a hit game, but reduce the lifecycle. The long tail in FarmVille's active user levels becomes shorter when there are no new users over time. One might ask what would happen if Facebook had already been mature at the time FarmVille was released. To test this, I have simply set the System Dynamics model so that the initial population of potential users is 1.4 billion, and the rate of new Facebook users is zero (or so low that it is inconsequential). All else is assumed equal.

The behavior for this 'What if?' scenario is illustrated by Figure 36 below. With so many more potential users, FarmVille's peak activity level becomes more than three times as high (probably an exaggerated outcome since the model's other inputs have not changed). However, its lifecycle is much shorter, falling below 10 million active users by month 30. This is still longer than the lifecycle of a typical console game, but after the game peaks, the rapid falloff starts to look like that of a blockbuster movie.

Figure 36: Effects of Facebook's maturity on MAU levels



The change in behavior is what makes this simulation important, not so much the actual numbers. How does the higher peak and shorter lifecycle affect strategy? Firstly, there is a major benefit because previously long-tail revenues move forward and are realized sooner. However, generally everything Zynga does will need to happen even faster. New games need to be launched more frequently to sustain their user base, and major content expansions need to be released sooner while the number of active users is still high. In this scenario, releasing a second expansion at month 40 has relatively little effect on activity levels because the game only has a couple million users left (although it may still be financially viable if many of these are paying users). Perhaps the best way to increase user activity this late into the lifecycle would be to launch the expansion with a major advertising campaign directed at inactive users, in which case the previously discussed reactivation loop would need to be implemented in the System Dynamics model.

Current testing and monetization practices are affected by the shorter lifecycle as well. Many firms focus on getting product to market as quickly as possible, and they speed up the process by relying on their ability to optimize post-release. However, in the mature market scenario the product is adopted so quickly that if the game is not properly optimized, a significant number of users will quit at a faster rate. One online games consultant has suggested that this problem can be remedied by a longer beta test period, which will allow a developer time to carefully optimize their product before it is adopted by a wider audience [89]. A related issue is that, upon a game's release, developers often focus on growth first and monetization later (similar to the approaches of Facebook and other major social media sites referenced in Chapter 5), but as the lifecycle decreases so do long tail revenues. As a result, efforts to monetize will need to happen sooner while the majority of users are still active. A possible alternative solution to these problems is to decrease the rate of word of mouth by adjusting the game design (e.g., decreasing the number of in-game friends needed to achieve certain tasks will decrease the number of

invitations sent to potential users). This will, in turn, slow the adoption rate, giving the developer more time to optimize and monetize.

Although a hit game will realize higher revenues more quickly, the decreasing length of the social-casual game lifecycle increases risk by requiring Zynga to develop and release hit products at a faster rate with less tolerance for failure. This problem becomes worse as larger competitors enter the market and steal users at a faster rate. It is wise that Zynga is seeking to diversify into products with long-term value—namely the "Project Z" social networking platform, which if successful, will reduce the potential stress on the company's product development timelines. While a string of flops will always hurt a company, in the future of social-casual gaming it can ruin one even faster.

Chapter 5: Social media principles and social-casual gaming

Social media is a new concept that emerged during the Web 2.0 era and generally refers to a variety of web-based platforms that host and provide user-generated content. Although characteristics of it had been emerging with the growth of the Internet, social media entered the public consciousness in 2006 when *Time Magazine* chose "You" as its person of the year [90]. Social-casual gaming is an even more recent phenomenon that leverages the growth of social media and most significantly, Facebook. However, compared to social media sites, social-casual game developers have the unique problem of needing to launch new products in frequent intervals that create a social experience each time. To better approach this problem it is useful to learn lessons from the existing social media platforms that became dominant amid a field of competitors. The first half of this chapter investigates the early growth periods of five major social media sites in order to develop principles for designing, developing and launching social media products and platforms. The second half of the chapter discusses these new social media principles as they pertain to social-casual gaming.

Principles for launching social media platforms

As of this writing, five of the top ten highest-traffic websites around the world are social media sites, including Facebook, YouTube, Blogger.com, Wikipedia and Twitter [91]. Compared to other sites that incorporate social media or social behavior to augment a business model (e.g., Amazon, Groupon), these five sites are 'pure' in the sense that their users primarily join to contribute content and/or interact with other users' content for free. They are online platforms with the primary purpose of social communication, and the business models often seem to be tacked on to what each website really does.

Launching a pure social media venture is particularly risky since the business model often depends on advertising revenue, which only becomes significant when there are many (perhaps millions of) users. At the same time, there exists a 'catch-22,' in which users will not join the site if there is no content, and there will not be any content unless users join the site. In this scenario, developing a core group of users that can create 'viral' indirect network effects may be extremely difficult yet vital to success. Furthermore, there appears to be little available guidance on developing and influencing indirect network effects for these new kinds of businesses. Advertising is one method for increasing early adopters, but these sites are generally not known for advertising themselves extensively. A strong platform strategy usually involves developing direct network effects, which can increase the number of adopters and potentially act as a catalyst for the indirect effects. However, Facebook had over 26 million unique monthly visitors [92] before they even began introducing application programming interfaces (APIs) for third party developers, meaning that they started to 'tip' well before expanding their strategy [93].

Given this confusing nature of social media startups, I decided to compare and contrast certain factors that I see as being relevant to the early adoption of pure social media sites. From this analysis I have developed several principles that seem to be generally applicable to social media sites, as well as a few that particularly apply to social networking sites.

Paths to Success

The paths to success for pure social media sites appear to be highly variable. As illustrated in Table 9 below, each of the five top social media sites has a unique combination of the speed at which users can create content, the degree to which each site fulfills an obvious unmet need, and the method of the platform's deployment to the public. These first two factors I have judged from personal insights, while the latter is based on available data. Also shown are official launch dates and significant milestones to get a sense for each site's rate of adoption.

Table 9: Comparison of major social media platforms

	Speed of Content Creation	Obvious Unmet Need?	Method of Deployment	Official Launch Date	Significant milestones (not directly comparable)
Facebook	Fast	No	Grassroots-style staged opening across college campuses	Feb. 2004	100 million users after **4.5 years [94]**
Twitter	Very fast	No	Internal prototype and testing, then opened to public	July 2006	190 million users after **4 years [95]**
YouTube	Fast (leverages pre-existing video)	Yes	Venture-funded. Beta tested then opened to public	Feb. 2005	Streaming 100 million videos per day after **1.5 years [96]**
Blogger.com	Slow	No	Multiple relaunches, beta tests and integration with Picasa	Aug. 1999	100s of thousands of users after **3 years**. Ranked 16th of sites with most unique visitors after **8 years [97]**
Wikipedia	Slow for full entries, Fast for partial entries	Yes	Began as side-project of Nupedia, which shared content	Jan. 2001	1 million+ articles in 100 languages after **3 years [98]**

Among these sites, YouTube stands out as having followed the most traditional route to business success. It was a venture-backed startup with a clear vision for addressing a relatively obvious need (sharing personal videos online), which it fulfilled through a typical development process, beta test and release. While YouTube likely had an initial library of video content from its beta test, the site's fast adoption benefitted from a vast amount of pre-existing homemade and professional content that just needed to be digitized and uploaded.

The value of Facebook, on the other hand, may be less clear to an outside observer who does not experience the social aspects of the service until they have sat down, filled out their own account and made connections with their friends' accounts. The gradual opening of Facebook across college campuses mimicked a grassroots campaign, which helped create buzz while also tapping into tightly-knit social circles that could be quickly copied into the Facebook environment (so that when someone joins many of their friends are already there).

Twitter meanwhile performs "micro-blogging" status updates that are similar to both Facebook updates and instant messenger away messages, but it provides this as a standalone function. Since this idea appeared to have already been *enveloped* by other services, the compelling need for Twitter was likely unclear, but certain differentiating factors (SMS text capabilities) and the behavior of 'following' (instead of 'friending') other users made the service more distinct with use. Also, its rate of adoption likely benefitted from its uniquely fast speed and frequency of new user-generated content (a result of its ultra-short 140 character format). Twitter was developed at the podcasting company, Odeo, where it went through an internal prototyping and proof of concept phase before being spun-off and opened to the public. This internal phase shares some similarity with Facebook's college-centric roll-out in that it incorporated a pre-existing social network that existed within the company, which provided its creators with a much better sense of the technology's prospects. If Twitter had gone through traditional beta testing like YouTube (which was not designed as a social network), the beta test users likely would have been a group of strangers who had no interest in following each other's updates and the project may have been deemed a failure. Lastly, Twitter released developer APIs just months after launching, creating direct network effects that contributed to its early growth [99].

Blogger.com is the oldest of these five sites with the most tumultuous history. Having started as a side-project that "narrowly survived" the dot-com bubble, it was purchased by Google in 2002 and experienced a couple significant redesigns in 2004 and 2006 (both preceded by beta test rounds) [100]. When Google bought the 3-year old site, Blogger had "hundreds of thousands of users," which was a good core group of users, but a far cry from Facebook and Twitter, which 'tipped' much more quickly. I believe part of the reason for this slower growth is that content on Blogger takes longer for an individual to create because it involves more thoughtful, long-form writing. While each new submission may be richer in content, the updates are far less frequent. As a result, it has taken longer for Blogger to amass a comparable amount of traffic to those sites with much faster update cycles. However, its richer content is likely much stickier than a Tweet, and its targeted advertising is probably more lucrative than Facebook's because blog readers are not "interested in communicating with their friends," so much as they are seeking information [101]. During this time, Google also employed a platform strategy focused on developing direct network effects by integrating email posting capability and Picasa photo-sharing. Google also made Blogger's early premium subscription features free in order to subsidize users and focus on its advertising business. By 2007, Blogger had finally tipped and was now ranked the 16th top website by number of unique visitors (at this time YouTube was already ranked 11th, Facebook 21st, and Wikipedia was in the lead at 8th).

Wikipedia is unusual in this group as it is a non-profit so its growth strategy was never linked to revenues. The platform that has become Wikipedia was initially designed to facilitate peer reviews by

qualified professionals for an online encyclopedia called Nupedia, but it had an extremely low rate of content generation "with only 12 articles written during the first year" [102]. When Wikipedia was launched in 2001 as an open platform that anyone could modify and review, the website tipped very fast with over 1 million pages written over the next three years. A key advantage it had over other article-based sites, like Blogger, was that users did not have to write an entire article; they could contribute just the parts they already knew and leave the rest for others to fill in. As a result, new content was created quickly and frequently, incorporating current events as well. Wikipedia also leveraged in-house content being developed by the Nupedia team so that there would be a core set of articles to increase early adoption.

Principles and Conclusions

Given that four of the top five social media sites essentially started as side-projects with unconventional testing and deployments, there is the sense that for any new twist on social media there may be a uniquely ideal release strategy for attracting a core group of users that can develop indirect network effects. Nevertheless, in Table 10 below, I have developed a draft of principles to consider when launching social media sites.

Table 10: Social media principles

Generally applicable	• The longer it takes users to generate new content, the longer it will take to gain new users • To help the platform tip, release developer APIs and launch other initiatives that create direct network effects as soon as the core user group forms • If the compelling unmet need is obvious, then a traditional YouTube-like approach to funding, development and release may be viable • Subsidize the users
Applicable for social networking sites	• Test within an existing social circle • Develop a deployment strategy that targets tightly knit social circles (particularly those with high internal word-of-mouth) within the broader target market
Applicable for non-social networking sites	• By generating content in-house and in beta testing, a business can develop "core content" to overcome the catch-22 of no users→no content and vice versa

Comparisons to additional pure social media sites can test the robustness of these principles, and comparisons against failed ventures as well as niche competitors may provide notable additions and exceptions. At the same time, some of these principles are applicable more generally to platform strategy. For instance, Microsoft developed its suite of Office products as a type of "core content" for Windows, which increased its user base and made Windows an attractive platform for third party developers. Furthermore, the faster developers can contribute new software products to Windows, the

faster customers will adopt it, so it makes sense for Microsoft to speed up the process by releasing tools and frameworks that reduce a developer's time to market.

Other businesses that use social media as a complement to an existing product/service can also make use of the principles, but they should be careful to consider whether they apply in the given context. Since companies across industries are becoming increasingly social, there will be many unique circumstances that differ from pure social media. In the next half of this chapter I discuss the social aspect of social-casual gaming with particular focus on situations where these principles are useful to think about (whether or not they are applied).

Social Media Principles in Social-Casual Gaming

While games are a form of media that can have social elements, they are not pure social media because users do not provide the core content. Instead, social media is used in service of another product, similar to how Amazon crowd sources user ratings and reviews for its product pages and how Groupon relies on social media to sell coupons. Still, it is possible to use some of the principles I have developed when social media is used to enhance an underlying product or platform. For instance, subsidizing users is a common theme in social-casual games because they are free-to-play, which significantly increases the numbers of users and in-game social interactions. The remaining portions of this chapter discuss similar instances where these principles are being used, and in cases where the principles do not apply well to games, I have considered how they may relate to Zynga's Project Z platform instead. This discussion elaborates on key areas in which social media and gaming intersect. To provide some structure, this section is divided into three parts that discuss key design factors, development issues (primarily testing), and the Project Z platform.

Product design

Social media in the design of social-casual games serves two general purposes: increasing adoption and reducing user churn. This includes a spectrum of game designs, where on one end social media is merely an add-on to the existing gameplay, and on the other end, the gameplay is dependent on social media (i.e., two or more people are needed to play). The three most popular games currently on Facebook (*CityVille*, *FarmVille*, and *The Sims Social*) are in the middle of this spectrum, where a user can theoretically play alone, but will become more immersed and make more progress if they have many in-game friends who are also participating. This type of design pushes users to invite their friends without necessarily shunning users that may not have as many social connections.

Like YouTube, games generally fulfill an obvious need—entertainment. As a result, advertising campaigns can be highly effective in attracting early adopters, and Zynga notably spent over $80 million in advertising for 2010 (a substantial portion spent on Facebook ads) [103]. While advertising typically attracts the first set of adopters to a product, many games on Facebook also add invitation mechanisms that serve as a second and even more powerful method for attracting new adopters. Figure 37 below shows a common invitation window that allows a user to invite up to 50 of their Facebook friends simultaneously (names redacted) [104]. Invitations are effectively a form of word of mouth, but with certain characteristics that differ from the traditional view of word of mouth, in which people meet in person and one recommends a product to the other. Many games are designed to push new users to

invite their friends before they have spent much time experiencing the product for themselves, meaning that a person who does not like the game or only plays it once may still encourage others to join it. This is achieved by adding incentives to the gameplay. For instance, having a certain number of in-game friends can allow a user to access new items or game elements (see Adventure World example in Figure 38). Since users have a finite number of Facebook friends, they have a tendency to send more invitations after first adopting a new game than after months of playing. However, on-going social interactions with in-game friends also help sustain user retention.

Figure 37: Typical game invitation window

Figure 38: Certain items require social connections

Active users in social-casual games frequently interact with their in-game friends by exchanging messages, items, gifts, and gameplay actions. Many times these are explicit "requests" sent via Facebook, which prompt other users to perform an action (see Figure 39) [105]. In other instances, they may be "notifications," which simply advise other users of a recent action or achievement. These types of social interactions encourage users to respond by re-engaging with the game, and while re-engaged they have the opportunity to send further requests or notifications prompting other friends to respond. This cycle of social interactions causes users to become re-engaged many times, increasing user

retention rates. While invitations and social exchanges are common in social media platforms, social-casual games tend to have a noticeably different approach.

Figure 39: Typical Facebook game request

Pure social media sites generally rely on *pulling* user-generated content by simply providing the platform through which the user decides what to share and when to share it. Social-casual games, however, rely on *pushing* user-generated content through incentives and in-game popup windows that contain pre-written text and other content (e.g., gifts, virtual currency, game energy) for a user to share (see Figure 40) [106]. Messages and actions that are shared between active game users contribute to user retention, while messages that are shared on Facebook pages where they are seen by potential users contribute to word of mouth (and subsequently to adoption). Facebook previously allowed developers much more freedom in displaying messages from active users to potential users. These messages did not create a lot of variety, but they could significantly increase the rate of new game-related social content, which promoted faster adoption (a principle). However, Facebook became concerned that the rapidly increasing number of game-related messages on its users' pages reduced the visibility of more organic (pulled) content, making the site "spammy" for non-gamers [107]. Facebook subsequently limited access to its notifications and requests APIs so that potential users were not bombarded with messages, which decreased the rate of new game-related content and caused the user base for multiple game developers to fall by 10-12% [34]. Facebook has since been trying to find a middle ground by introducing new APIs that increase social game interactions without the spam, including "frictionless" requests that minimize the number of mouse clicks needed to share game messages [108].

Figure 40: Games encourage users to share their progress with friends

Product Testing

Since social-casual games rely on social networks, it is important to test the game within social circles and not merely among individual players. Testing is notably one of the strengths of social-casual game developers. Development for a medium complexity game is about six months, and most developers use an Agile process (e.g., Scrum), allowing them to iterate quickly and test more often. To get feedback from users during the development process, many developers conduct paper-pencil tests before writing any code, and hold both closed and open beta tests before officially launching a product [109]. The paper-pencil tests provide early qualitative data, but it is not until the beta tests that developers can see how their product performs in a social environment. Social game developers have become so analytics-oriented that as long as the tests have enough users they can simply mine the data to see how players with many in-game social connections are performing compared to those with few connections.

Larger developers, such as Zynga and Electronic Arts/Playfish, have an advantage over new entrants because they already have large user bases and significant amounts of data available on user behavior. For example, data mining can identify which users have high influence over others by looking at how many friends they have caused to join a game via invitations (often referred to as a user's virality rate). Funneling users with high virality rates to new games is particularly attractive since they are more likely to drive word of mouth, so developers should concentrate on moving these users to their new product (through cross advertising in existing products and targeted advertising on Facebook). After users have joined a new game, the developer can also optimize the virality rates by experimenting with different design factors. Major web-oriented firms, including Google and Zynga, commonly utilize A/B tests to conduct experiments for optimization [110] [111]. A/B tests are used to gather data on the effects of a change to a single variable from a baseline state. For many engineering applications, this type of one-factor-at-a-time experimentation can become expensive (often due to materials costs), but

for software delivered via the Internet, it is cheap and easy to change variables and target different samples of users. Other methods, such as multivariate testing, are sometimes used to test multiple factors at the same time, but the cost advantages for Internet firms are relatively low and noise factors can be high.

Unlike most products, testing continues over the lifecycle of a social-casual game in order to maintain user retention rates and to optimize the effects from new content that is added over time. However, there are problematic tradeoffs in how design variables are optimized for either user retention or user conversion rates (from non-paying to paying users). As incentives to buy virtual goods increase, more users will quit playing because of price sensitivities, decreasing user retention [77, p. 220]. The highest user retention rates therefore occur when profits are at zero, but if user retention rates become too short, profits also fall toward zero. Maximized profit is achieved by finding the optimal combination of conversion rates and user retention rates.

Zynga's Project Z Platform

The previously described 'catch-22,' in which users are needed to create content and content can only be created by users, does not apply to games because the games themselves are the core content (they are subsequently enriched by social content). However, this problem does apply to Zynga's "Project Z" platform, which according to early reports is intended to be a niche social network for Facebook gamers. While Project Z will have little user created content when it launches, it does benefit from Zynga's portfolio of games, which can be made available through the site (as a type of core content) to create direct network effects. Further, Zynga can duplicate notifications, requests and other game-related messages into Project Z so that there is some social content when the platform launches. Whether the site can *pull* organic user generated content will remain to be seen.

While Facebook's launch strategy was to gradually deploy across college campuses, which each had tightly knit social circles, Zynga already has such a large user base (150+ million monthly unique users) that a grass roots-type of campaign is unnecessary. Zynga can attempt to transfer its user base directly to Project Z by tying the platform to its existing games or to new ones. However, for Project Z to become an industry platform Zynga should consider how to grow the platform beyond its own user base to all gamers on Facebook.

Releasing APIs for games themselves is uncommon, but for the Project Z platform this is an important component of strategy. APIs will allow other developers to create products that leverage the platform and strengthen its offerings. The principle I have suggested is to release developer APIs as soon as the core user group forms, which will attract developers who now see the value of the platform (its users). For Zynga this could happen very fast since it already has 150 million users to funnel into Project Z, meaning that other developers will see the value of the platform instantly. While Twitter's APIs were released only months after launch, Zynga should strive to make APIs available even sooner to strengthen the platform's ecosystem as soon as possible and prevent the decay of its users (as we saw happen with RewardVille in Chapter 3).

Chapter 6: Conclusions and future research

This chapter summarizes the main findings of the thesis, including key recommendations and observations. These are organized by the same structure of the thesis and highlight the most relevant conclusions. Following this summary I have included several potential areas of future research beyond my own work that could lead to interesting and useful results. The ideas on their own may not provide enough material for future theses, but they can act as a starting point for further scholarly research.

Summary of conclusions

While many types of free media rely on advertising as the chief source of income, Zynga and other free-to-play game developers have become successful with a new revenue model that relies on the sale of in-game virtual goods to active users via micro-transactions. The micro-transactions are made possible through a virtual currency, each unit of which represents a mere fraction of a penny. However, in most cases only 1-3% of users ever make purchases, meaning that free-to-play games only become profitable when enough users (millions) are playing over a long enough period of time. This issue is similar to many software-as-a-service companies that also earn revenue over the lifetime of each user rather than from large, up-front license fees. I have recommended for these types of companies to focus on three key issues: increasing adoption rates, increasing conversion rates (from non-paying to paying users), and decreasing churn rates. Although social-casual games have low conversion rates, many firms have overcome this problem by integrating with the rapidly growing social network, Facebook, which they have leveraged to attract enough users to make virtual goods profitable.

Zynga has become the most successful firm in free-to-play social-casual games, with over 150 million unique monthly users (through Facebook) across a large portfolio of games, but just a few of these games (e.g., *FarmVille, CityVille, Zynga Poker*) are responsible for the majority of users and earnings. Given the growth of virtual goods within Facebook's own ecosystem, the social network has imposed a 30% fee on all transactions conducted through its platform. This fee has reduced Zynga's revenues while its expenses have continued to grow. Facebook has agreed to help Zynga meet active user targets, but it is unclear what recourse Zynga has if it cannot maintain its desired rate of growth. Further, Zynga must release new products in frequent intervals just to overcome user decay, let alone attract new users.

Maintaining the user base should be considered key to Zynga's long-term strategy because the firm continues earning revenues for as long as its users are active. Currently, Zynga accomplishes this by funneling decaying users to new products through various methods including the Z Bar product platform. However, while Zynga can leverage network effects amongst its own products, it is unlikely to maintain control over the market because multi-homing between games is common, differentiation between products is high, and the lifecycle of games is relatively short. Project Z, on the other hand, has the potential to serve as a niche industry platform for gamers who want special social networking features beyond Facebook. While Zynga can gain some early adopters by tying its existing games to the platform (making it a games portal), it can also expand the ecosystem by providing APIs and frameworks (based on ExampleVille) that encourage third party developers to put their games on the platform too. This can create even stronger network effects and increase the rate of new games, making Project Z

stickier. Further, it reduces the reliance on new product development by keeping the user base in Zynga's ecosystem even when users are playing another firm's game. It remains to be seen how Project Z is monetized, but advertising is a likely candidate since Facebook similarly relies on ads. While Zynga can continue to rely on revenue from its existing games over the next few years, Project Z should be seen as an important long-term strategy because the lifecycle of social-casual games will shrink as Facebook matures.

The System Dynamics simulations conducted as part of this thesis show that social-casual games currently have longer lifecycles than traditional console games, but it is partly because of the underlying growth of Facebook, which has been expanding the market at a fast rate. Zynga can capitalize on Facebook's growth by releasing major content expansions to existing games that sustain users over longer periods, which in turn sustains word of mouth and causes an increase in adoption even several years after a product's launch. However, when Facebook matures the number of potential game users stops growing over time, which causes the lifecycle to shrink even though the market is significantly larger. As a result, it becomes harder to maintain the user base and may cause Zynga to make even more frequent product releases, putting further stress on new product development. Project Z becomes particularly important in this long-term scenario because it can ease the stress on Zynga's product development teams while also keeping users in Zynga's ecosystem. While much of the thesis to this point focused on issues surrounding Zynga, the penultimate chapter proposed several social media principles that can be applied to a variety of firms interested in social technology.

Using the principles that I derived from an analysis of five of the most successful social media websites to date, firms can consciously choose design factors, development methods and launch strategies that better leverage the social elements of their products/platforms. While there are exceptions to the principles, they are still a helpful guide, especially for platform companies without a pre-existing user base or social media strategy. Experienced firms, including Facebook and Zynga, may find the principles to be a useful reference when existing strategies drift and need to be recalibrated. Every firm, however, has its own unique set of circumstances and needs, and should consider how these ideas may help it achieve its goals.

Future Areas of Research

Reflecting on this thesis has led me to believe there are several additional avenues of research that may yield useful results. Some of these research areas are directly related to Zynga and Facebook, while others are more generally applicable across a number of firms. The potential areas of research that I have identified are derived from each of the four main content areas of this thesis: the free-to-play business model, platform strategy in social-casual games, System Dynamics modeling of a social-casual game, and principles for social media platforms.

Virtual goods have rapidly grown as the primary source of revenue for free-to-play gaming companies, and Facebook has captured a significant portion of the value chain in this market by inserting Facebook Credits as a common virtual currency between game developers and users. The potential for Facebook Credits, however, goes well beyond games and could eventually be used by any website that integrates Facebook Connect (including both digital and physical goods/services). To this

point, CEO Mark Zuckerberg has stated that Facebook "may choose to do 'a lot more' with Credits in the future" [112]. This is a compelling opportunity for Facebook and would make an interesting research topic by exploring other online payment systems (e.g., PayPal) and analyzing whether Facebook can envelop them. There is also the question of how Facebook would implement Credits for the purchase of real goods and services because it is a virtual currency that does not have a one-to-one relationship with any real currency.

Zynga will presumably continue to rely on Facebook Credits for Project Z, but since the niche social network is still in development, I have only been able to outline key steps that Zynga can take to create a stronger ecosystem for the gaming platform. Further insight can be provided following Project Z's release by identifying the platform strategy factors that will have helped it to succeed or caused it to fail. Perhaps the first obstacle is that Project Z must be useful for Zynga's users and provide a desirable functionality that Facebook does not have. Since Project Z will also be using Facebook Connect as the basis for Zynga's social network (essentially creating a second social network within Facebook's ecosystem), it will be interesting to see how Facebook and Zynga's relationship evolves if Project Z is successful.

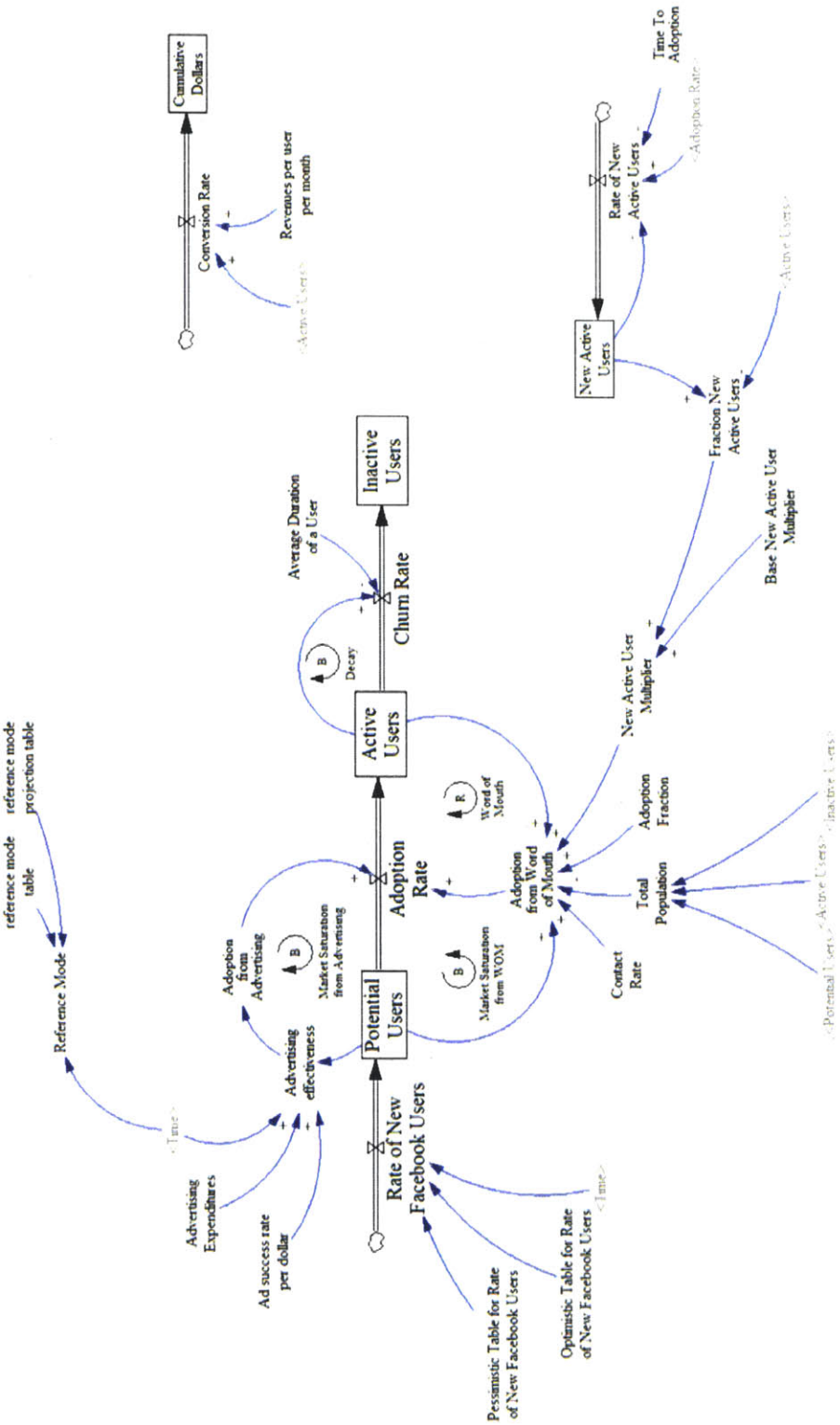
The System Dynamics model that I developed helped illustrate the importance of Project Z as a long-term platform since the lifecycle of Zynga's games will shrink as Facebook matures, but the model could be used to test other scenarios as well. For instance, instead of testing the effects from a major content expansion, Zynga could make larger reinvestments in advertising, which would require additional structures to be implemented into the model (namely, a reactivation loop and dynamic ad prices). It may also be useful to analyze the dynamics involved with monetizing users, since only a small fraction of the MAUs actually pay for virtual goods. Understanding these dynamics will help a firm optimize their conversion rates.

The final area of future research that I will suggest is in regards to the social media principles derived from an analysis of five major social media platforms. The principles would benefit from further analysis of niche platforms (e.g., LinkedIn) and failed platforms (e.g., MySpace) in order to provide additional confirmation or exceptions to the rule. While the principles are based on what I have called 'pure' social media, it would also be useful to analyze firms that use social components in service of another product or platform, as I have done with social-casual games. This would be particularly useful for existing companies that are developing their own social media strategies to promote their products (e.g., how has Coca-Cola used social media to sell soft drinks?).

As I have previously suggested, each of these ideas is meant to serve as a starting point for future research that may expand into broader subjects with similar themes. I feel that they also deal with relatively new topics that can help differentiate future scholars from past researchers. Given the high interest in social media and its effects on existing business models, I expect a significant amount and variety of academic analyses on social products and platforms (well beyond the scope of this thesis) to come forth in the near future.

Appendix

Model



Model Documentation

(01) Active Users= INTEG (
Adoption Rate-Churn Rate,
0)
Units: people
The Active Users stock is equal to the integral of the Adoption Rate inflow minus the Churn Rate outflow, plus the initial value, which is 0.

(02) Ad success rate per dollar=
1.66
Units: people/dollar
This variable is derived from a 0.60 cost to acquire one MAU at the time FarmVille was released. In reality, this cost has increased over time as a result of increased competition in Facebook ad bidding, but since the majority of FarmVille's ad expenses occured in the first 6 months following release, I have set the variable to be a constant value.

(03) Adoption Fraction=
0.00625*(1-0.1*STEP(1,10))
Units: Dmnl
The Adoption Fraction is an unknown variable and used to help scale the model in order to match the historical data. However, it does include a one-time decrease of 10% at month 10, when Facebook deactivated Zynga's access to its notifications system.

(04) Adoption from Advertising=
Advertising effectiveness
Units: people/Month
This variable is redundant and could be deleted from the model; however, I have chosen to keep it because it maintains consistency with the Bass model.

(05) Adoption from Word of Mouth=
(Potential Users*Contact Rate)*(Active Users/Total Population)*Adoption Fraction *New Active User Multiplier
Units: people/Month
The Adoption from Word of Mouth variable is equal to the total number of Potential User's Contacts per month, times the probability of a contact being an active user, times the the adoption factor, times the new active user multiplier.

(06) Adoption Rate=
Adoption from Advertising+Adoption from Word of Mouth
Units: people/Month

(07) Advertising effectiveness=

IF THEN ELSE(Potential Users=0, 0 , Ad success rate per dollar*Advertising Expenditures (Time))
Units: people/Month
Advertising effectiveness is a function of the ad success rate
times Zynga's expenditures in a given month. The If-Then statement is used to stop advertising when potential users reach zero, which is not entirely realistic since not all potential users would adopt the game, but this only applies under extreme conditions when simulating the model. The 'Time' variable is used to lookup the ad expenditures value.

(08) Advertising Expenditures(
[(0,0)-(10,2e+006)],(0,2e+006),(1,1.6e+006),(2,1.2e+006),(3,900000),(4,600000),(5,300000),(6,200000),(7,160000),(8,160000),(9,160000))
Units: dollars/Month
This is a lookup table estimating FarmVille's ad expenses over
FarmVille's lifecycle. The majority of expenses occur in the first six months following product release. In reality the long-term ad expenses after the initial launch period would depend on the game's income, but for simplicity this model assumes the expenses will stabilize at a flat value.

(09) Average Duration of a User=
2+RAMP(1/12, 0 , 12)+STEP(0.25,14)+STEP(0.25,40)*0
Units: Month
The Average Duration of a User is set initially at 2, but
increases to 3 after the first year of FarmVille's release as the number of one-time adopters shrinks. There is also a sudden increase 1-week at month 14 when Zynga releases a major content expansion to FarmVille. I have incorporated a similar increase at month 40 to test what happens when a major expansion occurs late in the game's lifecycle.

(10) Base New Active User Multiplier=
2
Units: Dmnl
This variable is set as a constant value of 2, meaning that the
word of mouth for New Active Users is twice as high.

(11) Churn Rate=
Active Users/Average Duration of a User
Units: people/Month

(12) Contact Rate=
130
Units: people/people/Month
The Contact Rate is set to 130, which is the average number of
Facebook friends for a given user.

(13) Conversion Rate=
Active Users*Revenues per user per month
Units: dollars/Month
The Conversion Rate is equal to the number of Active Users times
the Revenues per user per month.

(14) Cumulative Dollars= INTEG (
Conversion Rate,
0)
Units: dollars
The Cumulative Dollars stock is equal to the integral of the
Conversion Rate inflow, plus the initial value, which is 0.

(15) FINAL TIME = 60
Units: Month
The final time for the simulation.

(16) Fraction New Active Users=
IF THEN ELSE(Active Users=0, 1 , New Active Users/Active Users)
Units: Dmnl
The Fraction New Active Users variable is equal to the number of
New Active Users divided by the total number of Active Users.
The If-Then statement is used to accomodate the extreme ends of
FarmVille's lifecycle, when Active Users is zero and the
resulting function would otherwise be undefined.

(17) Inactive Users= INTEG (
Churn Rate,
0)
Units: people
The Inactive Users stock is equal to the integral of the Churn
Rate inflow, plus the initial value, which is 0. This stock
currently has no outflow, but a reactivation loop, from Inactive
to Active, could be implemented if testing related scenarios.

(18) INITIAL TIME = 0
Units: Month
The initial time for the simulation.

(19) New Active User Multiplier=
MAX(Fraction New Active Users*Base New Active User Multiplier,1)
Units: Dmnl
The New Active User Multiplier is equal to the base multiplier
value (which is 2) times that fraction of Active Users that are
new to FarmVille. The MAX function is used to maintain a lower
limit of 1.

(20) New Active Users= INTEG (
Rate of New Active Users,
0)
Units: people
The New Active Users stock is equal to the integral of Rate of
New Active Users, plus the initial value, which is 0.

(21) Optimistic Table for Rate of New Facebook Users(
[(0,0)-(60,40)],(0,20.833),(24,20.83),(36,18.75),(48,17.08),(60,9.167))
Units: people/Month
This is a lookup table containing the historical data and
optimistic forecast for total active Facebook users.

(22) Pessimistic Table for Rate of New Facebook Users(
[(0,0)-(60,21)],(0,20.833),(24,20.83),(36,9.375),(48,8.542),(60,4.583))
Units: people/Month
This is a lookup table containing the historical data and
pessimistic forecast for total active Facebook users.

(23) Potential Users= INTEG (
Rate of New Facebook Users-Adoption Rate,
2.5e+008)
Units: people
The Potential Users stock is equal to the integral of the Rate
of New Facebook Users inflow minus the Adoption Rate outflow,
plus the initial value, which is set to be 250MM users at the
time FarmVille was released.

(24) Rate of New Active Users=
Adoption Rate-New Active Users/Time To Adoption
Units: people/Month
Rate of New Active Users is equal to the number of users that
adopt FarmVille in a given month. The calculation used for this
rate is typically for information stocks, but it is used in this
model to determine the fraction of active users that are new to
the game.

(25) Rate of New Facebook Users=
1e+006*Pessimistic Table for Rate of New Facebook Users(Time)*1 + 1e+006*
Optimistic Table for Rate of New Facebook Users(Time)*0
Units: people/Month
The Rate of New Facebook Users is set to equal either the
pessimistic table or optimistic table, but never both at the
same time. By multiplying one table by 1 and the other by 0 one
can ensure only one table is active at a time.

(26) Reference Mode=
IF THEN ELSE(Time<=28, reference mode table(Time) , reference mode projection table

(Time))
Units: people
The reference mode relies on two lookup tables, one containing
FarmVille's historical data and the other containing a forecast
from month 28 to month 60.

(27) reference mode projection table(
[(0,0)-(60,4e+007)],(28,3.632e+007),(60,1e+007))
Units: people
This is a lookup table containing the reference mode's forecast
from month 28 to month 60.

(28) reference mode table(
[(0,0)-(30,1e+008)],(0,0),(0,0),(0,0),(1,4.63094e+006),(2,1.66767e+007),(
3,3.34392e+007),(4,5.24083e+007),(5,6.27924e+007),(6,6.89728e+007),(7,7.38528e+007
),(8,7.57783e+007),(9,8.30045e+007),(10,8.2794e+007),(11,7.83728e+007),(12
,7.02206e+007),(13,6.3373e+007),(14,5.97557e+007),(15,6.19653e+007),(16,6.19662e+007
),(17,5.63132e+007),(18,5.37383e+007),(19,5.78507e+007),(20,5.32989e+007),
(21,5.06e+007),(22,4.701e+007),(23,4.692e+007),(24,4.448e+007),(25,3.836e+007
),(26,3.457e+007),(27,3.485e+007),(28,3.632e+007))
Units: people
This is a lookup table containing the historical data for
FarmVille's first 28 months of release.

(29) Revenues per user per month=
0.374
Units: dollars/people/Month
This variable is set at a constant value of 0.374 dollars per
person per month, which was determined by the amount of revenues
earned by FarmVille so far this year, as well as the average
MAUs over the period.

(30) SAVEPER =
TIME STEP
Units: Month [0,?]
The frequency with which output is stored.

(31) TIME STEP = 0.125
Units: Month [0,?]
The time step for the simulation.

(32) Time To Adoption=
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Units: Month
This variable is set as the time over which a new set of
potential users become active users.

(33) Total Population=

Active Users+Inactive Users+Potential Users
Units: people
Total population is equal to the sum of all users (potential,
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(01) Active Users= INTEG (
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