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Science and Technology**

Economics in the Small and Independent Game Industry

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Problem description:

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The networked computer game industry has experienced a huge increase in active players and income during the last decade. The emergence of online-multiplayer games such as World of Warcraft and Counter-strike, as well as casual games on facebook etc has huge impacts on the value chain in the industry. Further, the possibilities for digital distribution of games opens for production and sales of small games and games made by small teams or individuals who earlier would have a hard time distributing their games. In this assignment, the student will look into the economy of such games.

In particular:

- Study games made by small teams or in peer production compared to bigger productions with focus on publishing channels and gaming platforms.

- Study and analyze business models of selected actors through Osterwalders business model ontology

- Identify and describe future scenarios and possibilities for games from small teams or peer production

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Supervisor: Harald Øverby, ITEM

Abstract

In order to look into the small and independent game industry this thesis presents an analysis of the business model of the game Minecraft using the ontology and framework defined in Osterwalders dissertation. The main pillars, product, customer interface, infrastructure management and financial aspects are explained in addition to various common revenue models used by game developers and publishers. The thesis further models the economy of the game and identifies its main cost accounts; storage, bandwidth, office rental, salaries, professional taxes, transactions and miscellaneous costs. Based on this, in addition to the revenues connected to the game, the thesis shows the most important success factors for the developer in regards to peer-production and value creation and shows the most important changes and suggestions for the future of the game.

Furthermore, the thesis suggests important traits and effects for independent and small games based on the findings in the case study of Minecraft. Among these are free model effects and network effects in order to attract users and obtain high value networks at low costs and utilizing revenue models based on the value of the network through increased sales of value-added services, advertising and new market acquisition.

Preface

This thesis concludes my master's degree in Communication Technology at the Norwegian University of Science and Technology (NTNU).

I would like to thank my supervisor, Harald Øverby, for comments and suggestions through the semester.

I would also like to thank my family and friends for providing me with support during my work and my employers and coworkers for being understanding and helpful towards the end of my work.

Lastly, I would like to thank my parents for their support and contributions through my entire education enabling me to reach my goals.

Thank you!

Trondheim, July 1, 2011

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Acronyms

CBC – Customer Buying Cycle

DLC – Downloadable Content

DRM – Digital Rights Management

EA – Electronic Arts (game developer and publisher)

FPS – First Person Shooter

ICT – Information and communication technologies

MMOFPS – Massive Multiplayer Online First Person Shooter

MMOG – Massive Multiplayer Online Game

MMORPG – Massive Multiplayer Online Role-Playing game

MUD – Multi-User Dungeon

OGS – Online Gaming Service

PSN – Playstation Network

PvP – Player-vs-Player

RPG – Role-Playing Game

RTS – Real-Time Strategy

1   Introduction

The global video game industry market is predicted to reach $70 billion by 2015 (1). According to the Entertainment Software Association consumers spent $25 billion on video, hardware and accessories in the USA in 2010 (2). They further state that the purchases of digital content accounted for 24 percent of game sales, generating almost $6 billion in revenue. The industry has also been growing through the economic recession with a 10 percent increase each year. This shows the popularity and power of gaming entertainment industry and the potential within it.

At the same time the internet is growing, as shown by the transition from IPv4 to IPv6 because of the possible 4.3 billion addresses in IPv4 were used, and more and more people acquire computers and consoles for gaming (3). With the development in hardware people are able to create games and other content at home and with the prices for hosting and wide array of publishing channels, people are able to publish their work and reach potential fans, users or customers. Through blogs, forums, community sites and social sites people can publish their opinions and provide hosting for downloadable content at a low cost or no cost at all.

This development has opened for a whole new group of game developers. The traditional way of creating games required funds and investments to pay for the development, hosting and marketing of the game, which lead to most games being developed and published by established commercial companies. The mentioned changes makes it possible for a single person or small groups of independent developers to create games using coding frameworks and available shared software source code, host on cheap domains and market the game through free channels. It also opens for collaborations between people through the internet letting people contribute with work and content to projects out of interest or enjoyment while being on different sides of the earth. This form of peer-production let people utilize the capacity of the free labor people are willing to contribute with in order to create great things, enjoy or develop themselves.

The purpose of this project is to look in to such small group developments and the revenue models connected to them in order to see the possibilities they have to become successful

amongst the big productions from large publishers. How these small development teams utilize the potential of peer-production combined with creating revenue is also an interesting aspect. In order to answer these questions this report studies the business model of the indie success Minecraft in detail to describe how a game developed by a single man on his spare time has become one of the most popular games of 2010 and outselling several big productions by established game developers. This thesis also looks in to other games describing how they utilize peer-production and which revenue models they used in order to make money.

1.1 Contribution

A detailed study of the independent game Minecraft is performed using Osterwalder's business model ontology framework. The framework is thoroughly described in the thesis. The study further present how the game operates in order to create value and offer it to customers and how the game is financially viable.

This thesis also looks into the independent game industry, peer-production and important connected elements and related game examples.

Finally, an analysis of Minecraft is performed describing the games cost accounts and revenue in addition to describing important factors to the game's success.

1.2 Thesis Scope and limitations

This thesis focuses on small and independent games based on the assumption that these games include games made by individuals and small development teams either in small companies or independently.

There are several more revenue models within gaming than the ones that have been presented, but they can be described as diversions of the main models described in this thesis.

The main focus of this thesis is on the game Minecraft and its business model and economic structures. As I have not been able to get all the needed economic information from the

game some of the cost accounts and the connected numbers are based on assumptions and experience from other games and businesses. For this reason the calculations are somewhat speculative and should only be seen as a model and not a stated truth. The thesis is limited by studying only one successful example of an independent game considering the vast amount of games available within the specific industry.

1.3 Outline

This thesis is outlined as follows:

Chapter 2 provides the necessary background information on gaming industry in general and the main game genres found in the gaming market.

Chapter 3 explains the terms peer-production and free in regard to gaming industry.

Chapter 4 explains the definition of small games and independent games and describes common traits found within the category both in a general sense and through concrete game examples.

Chapter 5 describes Alexander Osterwalders business model ontology used as a basis for the case study presented later. This chapter also presents and explains the most common revenue models in gaming industry.

Chapter 6 presents a detailed in-depth study of the business model of the independent game Minecraft.

Chapter 7 contains the analysis of the results found in the case study and discusses the effects connected to the game's success. It also summarizes the results and describes suggestions for future changes to Minecrafts business model.

Chapter 8 summarizes the most important findings and concludes.

Chapter 9 comes with suggestions to future work related to the findings in this thesis.

2   Background

This chapter provides background information on the gaming industry and computer games in general. In addition it describes the traditional game value chain and two important effects in relation to value networks.

2.1 History and development of Game industry

The origin of computer games go as far back as the end of the 1940's when cathode ray-tubes were used to make a simple game (4). During the following years several games were based upon this technology or other devices hardly available for most people. It wasn't before the start of the sixties that games started being available and influential with the game Spacewar leading the way (5). From this point on more games were being developed and the result of the continuing development was the release of the first home video game playable on television sets, Chase, in 1969. After this computer gaming became commercial and games were developed towards the home market and the general public. From this point games diverged into different platforms, namely arcade, console, mainframe, personal computer and handheld gaming.

In the start of the seventies coin-operated arcade games was introduced to the public with an arcade version of Spacewar! called Computer Space made by Nolan Bushnell and Ted Dabney. Even though it was unsuccessful because of pricing and a steep learning curve it was

the first commercialized mass-produced video game when released in 1971. The following year they founded Atari and created the famous game Pong. Pong was a widespread success with over 19,000 arcade machines sold.

At the same time as the arcade games started emerging the first video game console was being developed by Ralph Baer and in 1972 the system, Magnavox Odyssey, was released in the USA (6). The Odyssey based itself on using cartridges altering the circuit logic to offer different games. Through Philips, who bought the game, the console was offered in Europe and the combined sales of the two markets reached 2 million units for the first commercial home gaming console.

In 1975 Atari had created a console version of Pong aiming for the home market. Through an agreement Atari got an order of 150,000 consoles to be sold through Sears stores across USA, and during the Christmas of 1975 they had sales surpassing $40 million (7).

At the same time as the Odyssey was developed and arcade game machines were being sold university mainframe computers were being used to develop games, but since the development often were performed by students using expensive equipment unofficially or illicitly many of the games were kept a secret or at least not being actively spread. Despite this some environments or communities for distributing and sharing games were formed, there amongst the PLATO system and DECUS. These environments allowed game developers to share their inventions and through the seventies many games were created in the student communities and distributed on the mentioned networks. They might also be seen as the first form of online gaming as they allowed for more than one player to play against each other over the net.

The golden age of video arcade games came at the end of seventies starting with the release of Space Invaders by Japanese company Taito in 1978. With Space Invaders arcade machines became usual in locations like shopping malls, stores and restaurants (8). Atari bought the rights to sell the game in the USA and with the success from that became the fastest growing company in American history up to that point (9). Despite the success Atari was experiencing a dispute on the company's future direction with the owners, the entertainment conglomerate Warner Communication, Bushnell left the company and was soon followed by many of the programmers. They went on to create the first third party game developer

company, Activision, and could stand by watching as the market was trashed with poor quality games. Together with the introduction of home computers this happening caused the collapse in the console market from 1982 to 1984 (9).

The collapse in the console market allowed Nintendo to take over the home video game market with its 8-bit Nintendo Entertainment System released in 1985. The joysticks and keypads were replaced with Nintendos gamepad creating a new standard. In addition they introduced licensing of third party developers allowing other companies to develop games for their console and secured these licenses by using official authentication data chips needed to load the game. Although there were companies refusing to pay the fee and trying to circumvent the authentication, Nintendo could collect fees on most games sold to their consoles. Opening for third party developers also opened for a larger vary of games and smaller companies to reach customers with their ideas. This business model was successful and has later been adopted by other console gaming companies like Microsoft (Xbox) and Sony (Playstation).

As mentioned one of the reasons for the console gaming collapse in the mid-eighties was the development and accessibility of personal computers. Although computers were made and sold for personal use in the last half of 1970s they weren't that usual in households until the 1980s. The Commodore 64 was released to the public in 1982, priced low and marketed aggressively. It sold a total of 17 million units making it the best-selling single personal computer of all time (10). From that time computers were found in millions of homes offering software for personal productivity, programming and also games. Computers were not only considered a toy like consoles were, but rather a tool for doing more useful things like helping with homework or work related tasks. During the eighties the progress of computer technology was significant with steadily increasing capacity and thus possibility.

One result of the development was the emergence of online gaming in a more traditional sense than the PLATO platform mentioned earlier. The first online games were so-called MUDs or Multi-User Dungeons allowing several people to interact with each other within text-based adventure games. The first such game was a game developed by Roy Trubshaw allowing people to play online over the network at Essex University in the United Kingdom. The same game became the first Internet multiplayer online game when the university

network was connected to ARPANet in 1980 (11). From that point on there were several similar online games created and offered commercially. Up until 1987 they were all text-based though and graphics were gradually introduced in to computing and interactive games.

From the beginning of the 1990s graphics were introduced, the Internet was growing, computer technology was being developed fast and people were buying computers and games. Because of this development the nineties became a decade for innovation. The graphics and capacity let developers introduce new genres like first-person shooters (FPS), real-time strategy (RTS) and massive multiplayer online games (MMOG). In 1991 the first graphical massive multiplayer online role playing game (MMORPG) was introduced with Neverwinter Nights made by Stormfront Studios, a game introducing player-vs-player combat in-game resulting in the forming of clans, leading the way for games to come like World of Warcraft. It also allowed for smaller consoles like Nintendos GameBoy, letting people have more portable devices and allowing them to bring games with them, while arcade games become less popular. The prices for computers and the possibilities to reach customers online also open for smaller companies to attempt game developing. A result is that shareware become popular with small companies offering trials and demos to the market for free in order to promote their game. The transition from floppy disks to CDs also made it possible to reach customers with increasingly bigger games

An example and forerunner in the use of shareware was id Software the creators and developers of Doom. This game was a FPS-game with 3D graphics and multiplayer possibilities allowing players to make their way through different levels shooting aliens and zombies. At the release of the game in 1993 it was distributed online as shareware letting people play the first levels of the game for free, but restricting further access to the game to paying customers by making them have to pay for the remaining levels. Doom reaching an estimated 10 million users within two years lead to a wave of so called Doom-clones attempting to follow the success of id Software from the mid-1990s. This also was a forerunner for digital distribution of games, showing the potential of low-cost digital distribution.

The popularity of and possibilities tied to online gaming made way for other types of companies looking for ways to make money on the growing industry. In order to provide online gaming aspects game developers needed servers and hosting for their networks in order to connect their customers together and manage their online services. During the nineties several companies specializing in this part of the business emerged offering services to game developers, amongst these companies were the online gaming services (OGS). OGS were portals basing themselves on providing games to customers online in addition to value added services.

During the 2000s the growth of the internet and the hardware capacities increased the number of involved companies, reduced the prices and opened for more people to enter the market. At the same time several big developers and publishers were established as market leaders through successful games. Amongst them is Electronic Arts (EA), a company established in the eighties which remained strong in the industry and created great successes like SimCity. They built on the success and were able to buy and establish development studios all over the world releasing several games each year. Another example is Blizzard Entertainment, the company behind World of Warcraft, Starcraft and Diablo. They were acquired by Vivendi which later merged with Activision making it part of a huge entertainment conglomerate and an economic force in the industry.

Although the technological development made it easier for small companies to enter the market it also lead to more competition in addition to juggernauts like Blizzard and EA, making it hard to survive. In addition the big conglomerates are inclined to buy small, successful companies early to make easy money and secure rights to expansions and sequels. This makes it hard for small developers to survive, but the prices and possibilities through the internet are coming to a point were creating games as a hobby and publishing them self is viable.

2.2 Gaming platforms

There are two main groups of platforms, personal computers and consoles. Within each main category there are several different types usually divided by the companies making the devices or the operating system on the systems.

2.2.1 Personal computers

The personal computer is the biggest single gaming platform with over $11 billion in worldwide revenue (12). The reason is that computers aren't bound to games connected to the creator of the computer letting many different types of computers (Dell, IBM, Apple) with different components (Intel, AMD) run the same games. Personal computers are therefor usually separated based on the operating system of the game. The three main types of pc gaming platforms are Windows, Mac OSX and Linux since not all pc games can run on all system. While this still is the case in a few cases the development has made it quite easy for developers to provide games for all platforms without much extra cost.

I chose to categorize smart phones as a sub group of personal computers since they stand out when it comes to computing capacity, screen size and controls and thus not eligible for most games made for the pc platform. They do however have the same free operating system letting anyone create games for phones.

2.2.2 Consoles

Consoles separate themselves from pc's as they are specialized electronic devices made for gaming and because they are tied to the producers. There are many different consoles available on the market and there is continuous development of the technology leading to releases of new generations of consoles. The main console producers on the market today are Sony with Playstation and PSP, Microsoft with Xbox, and Nintendo with Wii and DS. In order for developers to develop games for these platforms they require licenses issued by the respective console producers. Consoles were not connected to the internet for a long time restricting it to LAN multiplayer in small scales, but from the start of the 2000s the main consoles come with network cards making them available for online gaming. The producers have also established OGS along with externally made game specific services in order to provide online services for their customers. Examples are Microsofts Xbox live and Sonys Playstation Network (PSN).

2.3 Genres

Video game genres are used to categorize games usually based on the gameplay. There are countless categories within video game genres which often separate games on slight differences. A single game can belong to several different categories depending on which elements of the game one focuses on although it usually is connected to a primary genre based on the gameplay and mechanics. I will present what I see as main categories and genres relevant to this thesis based on experience and common categorization done by gaming sites.

2.3.1 Action

The action genre is one of the broadest and most general genres with many subgenres. Action games are usually based on combat gameplay. One of the main subgenres is first-person shooters (FPS) which contain shooting games where the player control a character and interact with the game through the eyes of the virtual character using projectile weapons. Typical games within this subgenre are games like Counter Strike, Unreal Tournament and Quake as well as newer games like Halo and Call of Duty. Third-person shooter is also a similar subcategory separated from FPS' on the playing perspective letting the players get a wider camera perspective while seeing their character from a distance. Such shooter-games usually contain multiplayer features letting users play against each other over the internet in addition to single player campaigns and evolving story lines. Although there are limitations to the amount of players interacting in a match in standard FPS games there are games which contain massively multiplayer online first person shooter elements (MMOFPS) letting several hundred users interact on the same server. The multiplayer games often focuses on the interaction with other users instead of a story thus having set rules and restricted maps or areas.

Another significant area within the action genre is the fighting game subgenre. In such games the user controls a character either through first or third person perspective fighting with acquired weapons or their body against computer opponents or other users online. The character usually faces one opponent at the time like in games like Street Fighter or Mortal Combat, but there are also games allowing the player to move more freely and engaging

several enemies simultaneously like Super Smash Bros or battleground PvP in World of Warcraft.

2.3.2 Adventure

Adventure games were among the first games created like the mentioned text based MUD games introduced in the 1970s. Such games traditionally focuses on taking the player through a story by letting them assume the role of the main character and solve puzzles and challenges while interacting with the environment, usually without time pressure. The focus on storytelling and character development makes it hard to combine with multiplayer elements making most traditional adventure games single player. A often found trait with these games are the necessity of collecting items and use them to make ones way through the story. The lack of combat and action challenges separates this genre from the action genre.

2.3.3 Role-playing

Role-playing games (RPG) are often based on fantasy stories where the player controls one or more characters through the game. The characters develop and evolve with experience letting the player decide which attributes are to be developed and which skills are to be trained. This trait lets the character grow in strength to be able to overcome increasingly difficult tasks in addition to letting people customize their characters and influence their gameplay. The customization aspect of the game is important when it comes to creating attachment and dedication to the game. When it comes to gameplay it is often turn-based for games where several characters are controlled, but lately some RPGs utilize real-time combat. A well-known RPG game series is the Final Fantasy series consisting of 14 games, where turn-based gameplay were used from the beginning until real-time combat was introduced in Final Fantasy IV.

A subgenre of the role-playing game category is the sandbox RPGs which allow the player to move the characters through unrestricted areas in somewhat free-roaming way. The sandbox games often provide a huge world with large amounts of secondary content the characters can access in addition to a storyline that can be followed as the player sees fit

opening for a more individual take on how to play the games. There is no "right" way to play the game, although sandbox RPGs are not as a free as true sandbox games are as explained in section 2.3.6.

2.3.4 Simulation

Simulation is also a broad genre covering many types of simulation games. These games are designed to simulate aspects or parts of a real or virtual reality. Subgenres are construction and management simulations, life simulations, vehicle simulations and sports simulations amongst others. Construction simulations allow players to construct a city like in SimCity, control a government or business or manage a sports team like in Football Manager. Life simulations aim at allowing people to create characters and simulate aspects of life like raising pets, dating or working. The most prominent example is The Sims series by Will Wright and no EA Games. Vehicle simulators are pretty much games trying to recreate the experience of using a vehicle in a realistic setting in for example flight simulators or racing games.

2.3.5 Strategy

Strategy games aims at making the gamer think and plan carefully in order to overcome obstacles. The player often has an overseeing perspective and control over his units and structures much like in board games like Risk. Strategy games are generally divided in to one of four forms depending on whether the game focuses on strategy or military tactics and if it is turn-based or real-time. Many of the most popular strategy games are war games where the player needs to outplay and outsmart his opponents, either other players or computer opponents, in order to win. This often includes choices on which units to build, where to build them, when and how to attack and how to optimize the access to and collection of resources. Although such strategy games are played in an overseeing, godlike perspective some new games lets the player control single units through third person perspective. Prominent examples on real-time strategy games are Blizzards Starcraft and the Warcraft series. An example on turn-based strategy games are tower defense games where the player

defends a tower or castle from waves of attackers while upgrading the defense and weapon arsenal between the waves.

2.3.6 Sandbox

The term sandbox game is as mentioned usually used to describe games that allow the players to roam freely through an open world like in sandbox RPG's, but it more precisely refers to the mechanics of the game. A typical sandbox game provides the player with an open world without limits and constraints to what the player can create and do within the games parameters encouraging each player to define his game and objectives without a defined "right" way of playing. Although the goal is limitless worlds, games are limited by things like game design and coding restrictions. Minecraft, which will be studied in detail in the case study, is a typical sandbox game. Other known sandbox games are the Grand Theft Auto series and Nintendo's console game Super Mario 64, which although somewhat restricted allows players to choose their path and goal within the games.

2.4 Massive multiplayer Online Games

Massively multiplayer online games (MMOG) refers to multiplayer video games which are able to support hundreds or thousands of players at the same time. These are games played over the internet and feature one or more common, persistent worlds where the players interact with each other and the game environment. For a long time, as mentioned in the computer game history section 2.1, MMOGs were played on personal computers due to the necessity of an internet connection, but after the turn of the century consoles come with possibilities for internet connections and services enabling online multiplaying. One interesting trait for MMOGs is the fact that the persistent worlds in which the player interact continues regardless of which players are interacting with them, i.e. the world remains when a player logs off. Such games also aim at multiplayer as the main gameplay variant and have limited single player possibilities.

In order to provide these persistent worlds capable of supporting hundreds and thousands of users the game usually need dedicated servers hosting the game and connecting the players. The common solutions is to have "sharded" worlds meaning that several similar

worlds are hosted by different servers in order to divide the load or have a single world split up between several servers offering switching amongst them. Some games, like Minecraft, base themselves on private servers hosted by players which then usually supports fewer simultaneously connected players. Such games are generally not regarded as MMOGs due to not supporting enough players to be defined as massive, although it can be argued that the size of the game world should be the deciding factor.

When it comes to economy many MMOGs rely on monthly or bimonthly fees collected from the players to access the servers and play the games. The reason for this is the need for covering the expenses connected to hosting servers and transferring the large amounts of data to and from users. The prominent example of such a game is the aforementioned World of Warcraft supporting a user base of 11,4 million on sharded server worlds by collecting a monthly subscription fee from all users (13).

2.5 Social and casual games

Social gaming in general refers to gaming as a way of social interaction as an opposite of single player games and gaming in solitude. In connection to this thesis I will look at social gaming in the form of social network games which are offered through social sites like Facebook and other social networks. These games are usually offered as browser-based gaming meaning that the only necessary tool for playing the games is internet access and a web browser. Through the boom of smart phones and wireless net capacities, in addition to the general growth of people connected to the internet, the market for such games have exploded shown by the success of games like Farmville and Mafia Wars. According to a survey made by the Information Solutions Group a third of the adult population in the US and the UK have played a game on their phone during the month before the survey, making them mobile phone gamers (14). An important trait leading to the success of such games are the integration with peoples social networks allowing them to interact with friends through the game with friendly competition or alliances and such. An important trait is also the lack of victory conditions, the games does not end and have no ultimate goal. Instead they let users grow through experience and playtime to achieve points or other goods which can be compared with friends and other users. This gives people incentive to play the game, recruit

friends and possibly use money on virtual items and goods through micro transactions in addition to creating a form of lock in for people not wanting to walk away from the virtual status they have spent countless of hours building up. For this reason micro transaction revenue models are popular amongst these games and have been proven viable and successful shown by Farmville creator Zynga reaching $ 600 million in revenues (15).

These social games have proven popular amongst females with approximately 55% of the users in the US and UK according to a study by the Information Solutions Group for PopCap Games (16). This separates from the usual gamers which for most games are male dominated and enter the new market of casual gamers, where 74% of the paying casual game customers are female according to a report by the Casual Games Association (17). The report further claim that casual games was a $2.25 billion dollar industry in 2007, making it an interesting market.

2.6 Online Gaming Services

Online Gaming Services (OGS) as mentioned in section 2.1 at the end of the 1990s as a result of the increase in games being published due to lower costs and greater possibilities with the growing online gaming market. They were created in order to provide match hosting and connecting the users of online games in structured ways offering services like matchmaking, server hosting, tunneling, text and voice chat, game filters and friend lists as well as tournaments, rankings, game related DLC and customer support. These services added value to games and made it possible for smaller game developers to buy this service and offer full multiplayer gaming experiences to customers.

In the beginning of the 2000s Valve, the makers of Half Life and Counter Strike, released Steam. Steam was a platform originally design and created to update games automatically and increase possibilities for anti-piracy and anti-cheat measures. It was presented as a pure distribution network, but later replaced the OGS World Opponent Network and started offering the more traditional services as well. From 2005 Steam started adding third-party games to their services and distributing them digitally at an undisclosed fee. For small game developers it is an opportunity to reach a larger customer base and provide a better service for customers through established and streamlined services, and now with Steams active

user base exceeding 30 million it's an interesting partner to acquire if possible (18). Steam was not the only online gaming service that emerged, there are several sites offering similar services to customers like Apples Game Center and sites like King.com for computer users as well as Microsofts Xbox live and Sonys Playstation Network (PSN) for consoles.

2.6.1 Community sites

A subcategory to the OGS are so called community sites created by enthusiastic game developers or just gamers wanting to talk about and present games. Many of these sites look for new and interesting small or independent games, review them and present them to the community. Some sites even let users register and contribute to finding and presenting games or share experiences and ideas through forums and in that way help with distributing and marketing games. The downside of such sites is that they lack most of the expensive, value adding services traditional OGS offer. Despite this they are important for the smallest games when it comes to ideas and support during development and reaching customers with finished games. Examples of such sites are the blog indiegames.com which offer news and game reviews on small and independent games and tigsource.com which is a pure community of independent game creators and players. In addition to these there are countless sites connected to small and independent gaming encouraging growth and competition within the field.

2.6.2 The long tail

Developing and publishing video games has traditionally been reserved for larger customers due to the investment costs needed in order to create a game. Creating a game takes time and effort and revenues weren't possible before a finished game could be released, and even then there were and are no guarantees for profit or even covering expenses. The result of this has usually been that established companies create and release most big, commercial games, which again makes it harder for smaller companies to compete as they are matched up against big development teams able to create big games with thorough stories and smooth graphics. This is supported by the findings in H. Bergs thesis report The Computer

game industry, showing that 81% of the games found on his composed best seller list are franchise games either in a series or with one or more expansions (19).

The advantage of the OGS and community sites in addition to the development in technology and the internet is the possibilities created for small companies and independent developers to reach potential customers. Nowadays small games can be created in the spare time using existing framework and available source code found on the internet and distributing the game can be achieved through using torrents or establishing a simple FTP-server. As a result the growing long tail is available to the customers.
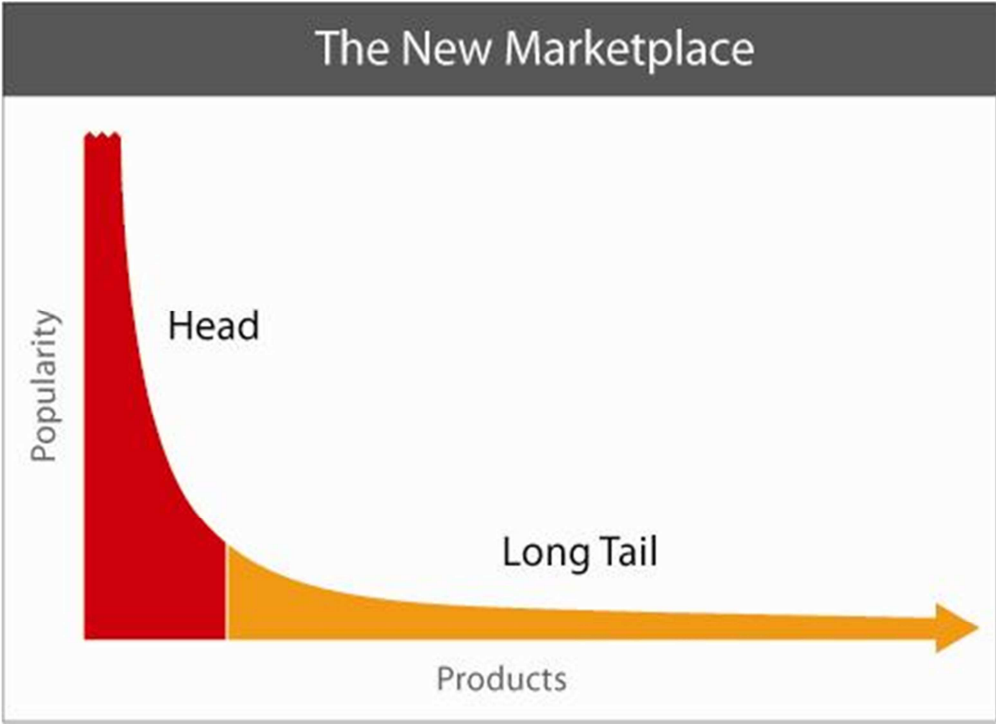
Figure 2: The long tail (20)

The long tail in gaming industry refers to the waste amounts of games that are developed and released without selling many copies or not even released at all, in other words less popular games. As figure 2 shows the games to the far left, in red, are the most popular mainstream games usually made by the big development teams and publishers with the goal of reaching as many customers as possible and covering a broad market. These games are generally games sold in retail stores and advertised on TV and in papers and so on. In the long tail, shown in yellow, independent games, niche games and games without marketing

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possibilities are found, often games by small or independent developers. The emergence of digital distributions makes it possible to provide these games to customers at low costs, as mentioned through OGS or even independently. This creates a whole new market of games offered to customers and creates opportunities for developers with good ideas or niche games to cover their expenses and even make a profit.

A downside for many small developers is that this also creates a lot more competition as it opens for a lot more games. In addition many of the large publishers are following the small game market in order to spot interesting games and buy the developers out in order to both create revenue through refining and publishing the games through their streamlined publishing machine and avoid emerging competition.

2.7 Value creation

Most games use a specific value configuration in order to create value for their customers and structure how this is done. The main configuration types will be explained with the connected primary activities connected to the configuration in section 5.4.2. In this section I will give a brief explanation of the traditional game industry value chain as background information in addition to some important traits connected to value networks.

2.7.1 The traditional gaming industry value chain

The traditional configuration for video games since the beginning is the value chain configuration including the capital and publishing layer, product and talent layer, production and tools layer, distribution layer, hardware layer and the end-users layer.
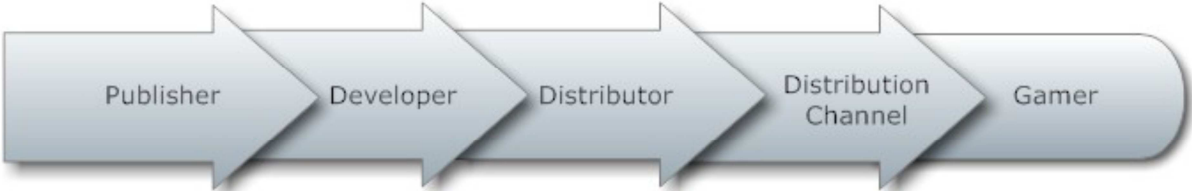
Figure 3: The traditional value chain (19)

The **publisher layer** is involved with financing development of games and licensing the titles seeking return on the investments. Publishers are often big, established corporations with investment funds available for games they deem profitable and they acquire licenses for popular trademarks or series like EA Games have with the fiction series Harry Potter and develop games using external or in-house development teams.

The **developer layer** consists of the developers of the game including designers and artists who create the actual game, designing characters and gameplay and implementing it. As mentioned these development teams can be part of the publisher corporation as well as be external development studios hired and contracted for specific projects.

The **production and tools layer** is usually part of the development layer and is concerned with generating game engines and other game specific tools needed for developing the game.

The **distribution layer** is concerned with reaching customers through available channels. The main channels for sales are retail stores and online distribution. The big publishers have marketing budgets and possibilities for reaching customers through TV-commercials, adverts and events. They can also promote and sell games through retail stores they have themselves or through partnerships.

Smaller companies can reach customers through cheaper or free channels like social networks, forums and user driver sites like Youtube. They often have to rely on online distribution as retail stores require a great deal of extra expenses through creating physical copies and paying fees to partners, but they can also utilize the mentioned OGS and communities for marketing and distributing games. Retail stores usually online provide the games found in the red part of the graph shown in figure 2, meaning the most popular games from the big game publishers.

The **hardware layer** refers to the providers of the game specific platform. This includes console makers, smart phone makers or virtual machine providers like Java or Flash, or even Facebook. The platform providers are often external companies not included in publisher conglomerate, but the layer is included in the value chain as it needs to be considered in

aspects like compatibility and controller utilization in order to create the best games possible.

The **end-user layer** is as the name suggests the end users of the games, the gamers.

2.7.2 Value network effects

As mentioned the small developers depend on online distribution and since they have more limited assets they have to utilize free or cheap channels in order to reach customers. A result of this is that many small games have value network as their primary configuration in order to acquire new customers. Although this is important to many games it creates a possibility for small games to market the game in an effective and cheap way. In relation to value networks and networks in general there are two important effects; network effect and positive feedback.

2.7.2.1 Network effect

Network effect refers to the effect one user has on the value of a certain product to other people. In other words how the value of the product or network is influenced by adding a customer. Although so called negative network externalities, where adding users decreases the value of the product, can occur, the most common use of the expression network effect is used in connection with positive network externalities. By increasing the number of users the value of the product increases. An example from games is that increasing the user base leads to more people to play with, more people to contribute with information and a more varied gaming environment, thus increasing the enjoyment and total value of the game. This effect can be directly connected to the effect positive feedback as an increasing product value attracts more customers which again create value, making it a loop of growth.

2.7.2.2 Positive feedback

The effect of positive feedback is mostly shown above. Positive feedback refers to a system where an increase in A leads to an increase in B which again leads to an increase in A. In gaming industry an example would be an online game like World of Warcraft where an

increase in users would make the game more interesting by increasing the number of people one can fight with or against which again attracts more users. This effect can lead to rapid, even exponential, growth over periods of time.

The downside of the network effect and a positive feedback loop is that it can lead to uncontrolled growth. For games this can result in capacity problems where the hardware system is unable to handle the amount of users and the developers are unable to scale their systems within reasonable time. Another potential problem can occur when a developer experiences a rapid growth in customers during a short time and overinvests based on expectations on the future. If the sale curve flats out they risk investing in unneeded capacity or unsuccessful ideas leading to future loss.

3   Peer production

The technological development over the century, and especially the last decades, has influenced not only the gaming industry, but also the economy has a whole. After the industrial revolution we have had an information economy with increased focus and emphasis informational activities. The important thing to keep in mind is that in the last 150 years the threshold for entering a market and reaching customers has been relatively high. As pointed out in an example by Yochai Benkler, starting the first mass circulation newspaper in 1835 came at the cost of approximately 10 000 dollars in the money of today. While after 15 years the cost for creating a daily mass circulation newspaper came at 2.5 million dollars (21). Although the accuracy of this example is uncertain it is a fact that the development went in this direction. In order of reaching people with information, culture and knowledge, funds were required in one form or another. The result was that sources reaching masses of people were commercial or governmental, something which is seen through development of media from the telegraph through radio to the television. In order to create value and distribute it to a larger number of people, investment or other means of raising money was required.

The emergence of the internet points towards a reversal of this development as it allows for creation and distribution to large masses at a much lower threshold cost. Almost 2 billion people, over one out four people, are assumed to be using the internet to different extents per June, 2010 (22). This number is also rising with the reduced prices on equipment and advances in technology. At the cost of a computer and an internet connection people can reach millions of people with their thoughts, ideas and productions. Through cooperation, sharing and coordinate coexistence we produce information and spread knowledge and culture in an increasing rate. The result of this is something Benkler defines as a new stage of the information economy, the networked information economy (23).

Pre-internet gathering information would be more time consuming and troublesome, going to libraries to find information, making physical copies of relevant material and perhaps visiting museums to locate useful pictures or other visual effects in order to produce material. This is also shown in gaming industry, as described in section 2.1 the origin of video games came from scientific and industrial environments and grew through university

research. Learning how to create a video game was not something anyone could do and information was not easily obtainable. Today there are as mentioned communities for game developers where any kid can participate and get tutorials and guides on how to create a game out of his bedroom. The various parts of information is contributed by many, many people focusing on different aspects, but together is more than sufficient to help people to create games on their own. This is the foundation of the networked information economy.

It was on this basis aforementioned Benkler introduced the term common-based peer production in his seminal paper Coase's Penguin in 2002 (24). Benkler describes common-based peer production as a new production mode where large groups of people, not organized through firms, contribute to large scale projects based on different interests and motivations, rather than market prices or orders from managers or leaders. In essence, projects where different, decentralized people voluntarily with somewhat different goals and motivation, together make a unified intellectual work, often through coordinating and connecting different components.

With commons-based Benkler means that the input and output of the cooperation processes are shared, leaving them equally available for all to use at their own discretion. For game developers and connected to an industry this is not beneficial as their goal usually is to make a profit with their products. The term peer-production is in that aspect more interesting and relevant. It refers to production systems built on individual contribution with self-selected tasks and level of contribution, and with a decentralized structure as opposed to a hierarchical structure with superior users assigning tasks.

As described by Benkler, there are a billion people in advanced economies that may have between two billion and six billion spare hours among them every day (23). Although people are different, have different interests, varying knowledge, talent and capabilities and different motivations, this shows the vast potential of peer-production and user contributed material. This again supported by the explosion of blogs, twitter messages, Youtube video and other user contributed non-commercial material flooding the internet. These productions in a digital environment lead to more information being produced and made available to users at its marginal cost.

As of now there aren't that many areas where peer-production has been used to full effect. The most prominent examples are Linux and Wikipedia where thousands of people contribute with content to a common product. The SETI@home project, where users can volunteer their spare computing power to download and analyze radio telescope data in search of extra-terrestrial life, has also been a success. When it comes to game development it would be hard to organize and structure a project of that size with many dependent components. The main possibilities as of now lies within getting user contributed content within a fixed framework.

The challenge for game developers is to create these arenas and environments opening for peer-production from the user base. This have already been done with success in games like Ultima Online and Everquest where users contribute to the story in the game using tools made available by the developers in the games, making user contribute to the games motivated by fun and entertainment.

Another aspect of peer-production relevant for the gaming industry, and then especially small games, is user contributed distribution. Through peer-to-peer file-sharing users share relevant files and information and in that way contributing with bandwidth and storage capacity as well as computing power.

3.1 Free

For the gaming industry peer-production is what can be seen as free labor and something that can reduce their costs it utilized. If a game developer is able to create an environment where the users for instance create content they can focus on framework and tools and avoid the development cost they would have to spend creating the same content. This type of free is free as in free beer as explained by Chris Anderson in Free – The future of a radical price (25). This means that the work done by the users is of no charge to the game developers without any ulterior motives or hidden costs which is truly free.

Anderson explains that there is wide range of meanings to the word free within the commercial use. Often free isn't really free like with buy one get one for free deals where the free product is included in the price. Other free products can be paid for through

advertisement or offerings made in order to attract customers to other full priced products. Despite this Anderson claims that all forms of free boils down to the same thing; money being shifted from product to product, person to person, between now and later, or into nonmonetary markets and out again (25). These so called cross-subsidies can be divided into four main categories when it comes to free models and they are the following:

Direct cross subsidies: Refers to when a product is free as an enticement to pay for something else. An example is the company Gillette which sell their razors at a low price in order to sell their expensive, disposable razorblades to the customers in the future. An example from the gaming industry is Valve who increased the sales of Half Life 2 and some other bundled games by offering the popular mod Portal exclusively through a game pack for a long period of time (26).

The three-party market: Refers to when a third party pays to be part of a market created by a free exchange between the two other parties. This is the typical advertising model where game developers can offer a game for free financed by third party advertisers. The customers get the game for free, but "pay" through views of the advertisement.

Freemium: Refers to offering a product for free alongside a premium product or value adding service. This often leads to a huge group of free users and a small group of premium users, something shown by the 5 percent rule; 5 percent of the users support all the rest. In regards to digital products serving the users of the free product cost next to nothing often making the small amount of premium customers cover them and create a profit.

Nonmonetary markets: This category concerns products or services being given away for free without expectation of payment. Peer-production is an example of this where people give of their time and labor without expecting any pay.

With the mentioned development in possibilities for game developers it will lead to an abundance of games with high competition and many actors competing for the same customers and markets. And as said by Anderson charging a price creates a mental barrier people in most cases won't bother crossing from a psychological point of view (25). The effort of thinking about if a product is worth the money is likely to be avoided by people if

possible, and for small game developers the competition and abundance of games will give them disadvantages facing free models with other pricing models.

The power or even necessity of free is shown in another form of free, namely piracy. For digital products history shows us that free often is thrust upon developers through piracy even if they never intended to utilize a free model. Anderson describes the case of a game developer setting what he saw as a reasonably low price for his product , but still ended up being pirated (25). When trying to find the answer through a technical discussion site he found that anything making purchasing and starting to play more difficult, like Digital Right Management (DRM), copy protection and complicated purchase routines, were seen as legitimate reasons to copy the game and that the game in general weren't perceived as valuable as he meant it was. For these reasons I mean that the concept of free will be important in the gaming industry in order to make it in to the market. If free isn't an option in many cases the users will make it one.

4   Small games and peer-production games

Small games are as described earlier on the rise and more and more games are created by small teams and independent developers. Even though there are several developers standing outside the so called indie gaming community I have chosen to look into that area due to the amount of games originating from it and connected to it. There is no exact definition of an indie game, but there are certain traits connected to the term. In addition to being developed by individuals, small teams or independent companies indie games are smaller than the typical mainstream titles and no financial backing from publishers. The result is as mentioned small budgets and limited possibilities for marketing and distribution of games. The lack in funds also makes it hard to reach the graphic levels of mayor developing studios, making the gameplay and ideas more important. Though the financial independence means no creative limitations or need for outside approval which lets independent developers create the games they really want to make the way they want to make them.

The indie gaming industry started on the PC platform and remains prominent there. The reason for this is that programming for the PC platform has been easier and more accessible than for consoles with more available development tools and libraries. Console game developers also have to pay license for Software Developments Toolkits from the console makers and in some cases have to pay fees on every sale made to the maker of the console. While the PC platform is in a general sense owner free, the console are owned by the developers; Microsoft for Xbox, Sony for Playstation, Nintendo for Wii and so on. Despite this independent game development is on the rise on the console platforms and toolkits and more suitable programming language are becoming available to developers. This is also useful for development for the smart phones being sold today although they in most cases are cheap or free to develop for.

Another important factor for indie games is the strong community around it. As mentioned you have sites like TIGSource and indiegames.com, but there are many other strong community sites and environments available on the internet and the interest around indie

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games is quite large. Global Game Jam for instance is an annual event allowing indie game developers to experiment and present ideas and in 2011 they gathered 6,500 people divided into 169 sites in 44 countries, who together created almost 1,500 games (27). It is quite a large generalization, but the indie gaming community is seen as supportive and full of enthusiastic users passionately interested in indie games and games in general. This makes it a good community for getting help and utilizing experience and knowledge through peer-production.

Despite there being thousands of indie games there are few games which create large profits. Developing indie games act more like a stepping stone for developers through being recruited to larger development studios either directly or through having their game bought by a big publisher. There are some success stories none the less.

4.1 Indie games

One of the successful indie game stories is that of World of Goo. It's a game built around creating large structures using balls of goo made by two former Electronic Arts employees Ron Carmel and Kyle Gabler. The game was made using open-source technologies such as Open Dynamics Engine and PopCap Games Framwork (28). They also avoided DRM protection on the PC version because they in an interview deemed it a futile and expensive attempt to prevent piracy in line with traits for digital products as explained in section 3.1 (29). The interview further states that many of their customers were convinced to buy the game by the developer's choice to keep it DRM free. This is interesting compared to the findings in the case described in section 3.1 and points to a significant attitude in the user base. It would be fair to assume that some of the users are against DRM and such tools to a degree that they are positively affected by the absence of it. And by avoiding it one can create a positive reaction from users who perhaps wouldn't normally buy the game.

The game was released for Windows and WiiWare (Nintendo Wii's OGS/Gameportal) in 2008 and received great reviews and several game awards and has later been made available on Microsoft's Windows Games on Demand and ported to iOS making it available for iPad and iPhone.

When it comes to economy Carmel claims that the two have spent $96,000 dollars covering rent and living expenses during the two year development of the game in addition to investing $4,000 on hardware, $1,000 on software, $5,000 on QA testing, $5,000 for localization and $5,000 on legal fees (30). Their revenue model has been based on retail sales and digital sales of the game for $20. In order to attract more customers they have also sold the game at discounted prices. Finding accurate numbers on sales and revenue is difficult, but after the release on iPad they sold 125,000 copies for $5 each during the first month (31). They also experimented with a pay-what-you-want promotion resulting in 57,000 sales and around $100,000 in revenues showing that they are making a profit on the game (32). Having the game available on many platforms and through many portals has probably lead to a great deal of sales securing a considerable profit despite fees to their distribution partners.

Another interesting point in connection with World of Goo is that they haven't resorted to freemiums or other free models in order to attract customers. They have however had a piracy rate as high as 82% which they claimed to be okay with and didn't regard as a problem (33). Not fighting the piracy might have helped them create a network and recruit more customers through network effects assuming that the pirates promoted the games to friends who in turn bought the game.

4.2 Peer-production games

Finding pure peer-production games is hard if possible at all. The reason for this is as mentioned that there usually is a person behind the idea who wants some sort of creative control or end up having it because of the need to create functional and dependent components. In order to create a successful and enjoyable game there are a lot of complex components which need to be made and integrated. This requires a great degree of oversight and control to do and doing this with peer-production and self-selected tasks requires a lot even with the technology available. There are however some games who have utilized peer-production as part of their value creation and development with user contributed material on nonessential and uncritical parts of the games.

One of the most known and prominent examples, although a big, commercial production, is Linden Labs game Second Life. The game is an online virtual world where users create avatars and interact with the environment and other users. As of 2009 Second Life had more than 15 million registered user accounts which now is assumed to be reaching 20 million (34). The game bases itself on providing a virtual world where all the content is user created. Meaning that they only created an empty, but limitless sandbox world and let users create whatever they wanted within it. By saving everything that is created they get a steadily increasing world developed by their customers.

Figure 4: Second Life in-game replica of NTNU's main building

The most interesting thing with Second Life is the revenue model used by Linden Labs. The game is free, letting anyone create a user account and an in-game avatar, but in order to create anything you need to own the rights to a piece of in-game property to build on. This property can be purchased from Linden Labs or from other users owning land. In order to own land you need to be a premium user which costs $9,95 a month, $22,50 quarterly or $72 a year. The premium membership also comes with a weekly stipend of 300 so called

LindenDollars (L$) which again can be used to purchase land and other items in-game. The LindenDollars can be purchased from Linden Labs for real money as well as traded back in for real money. The result of this is that Second Life has an in-game economy where people can earn actual money through transactions with other players and trading in the earned LindenDollars to Linden Labs banking service, which takes a fee for each transaction. There are supposedly people making a living as entrepreneurs within Second Life cashing out as much as $ 1,7 million yearly (35). The total economy of Second Life has also been said to as big as $567 million in 2009, about 25% of the U.S. virtual goods market.

Through this complex system model has integrated several revenue models in order to make money. By keeping the game free they attract a lot of users increasing the value of the game and by offering premium services they can charge their paying customers a subscription fee for allowing them to purchase land and create content which again increases the value of the game for existing and potential customers. In addition they make money through a micro-transaction model where making actual profit is the incentive for customers alongside the advantages it gives in-game. Although I haven't obtained economic numbers for Second Life it is without a doubt a success, much because of its innovative and well-planned revenue model and business model. The revenues are high through steady income from subscription fees in addition to micro-transaction revenue, and costs are kept low by utilizing peer-production for developing content and increasing the value of the game.

An example of indie game utilization of peer-production is connected with the mentioned game World of Goo. When they were to release the game on the European market they depended upon the World of Goo community to translate and localize the game into different languages. By doing this they got help from eager users with knowledge of the game and language skills to do the translations for free. Many other indie games utilize peer-production in similar ways to produce nonessential content like for example community sites and support sites. The most prominent example on this is Minecraft which will be studied in detail in chapter 6 and 7.

5   Osterwalders business model ontology

Descriptions of the meaning of the term business model will vary depending on whom you ask and there are several different opinions on the matter. In relation to this paper I decided to base myself on Osterwalders definition and further, his approach to, and framework for, presenting business models.

Osterwalder defines a business model as "*a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money. It is a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams* (36)".

Osterwalder bases his definition and work on business models on an extensive literary study of relevant work within the field. His studies lead to a complete business model ontology combining what he believed to be the most important and necessary areas found in his study. I have chosen his approach to business models because he presents an understandable and well defined framework for analyzing and presenting business models, covering all important aspects.

5.1 Ontology

The main goal of Osterwalders research was "to *provide an ontology that allows to accurately describe the business model of a firm* (36)." In other words, a framework for presenting and analyzing business models. As a result he defined four areas of importance regarding a company's business model, which are presented following (36):

- **Product**: What business the company is in, the products and the value propositions offered to the market.

- **Customer Interface**: Who the company's target customers are, how it delivers them products and services, and how it builds a strong relationship with them.

- **Infrastructure Management:** How the company efficiently performs infrastructural or logistical issues, with whom, and as what kind of network enterprise.

- **Financial Aspects**: What is the revenue model, the cost structure and the business model's sustainability.

These areas are further broken down into nine building blocks or elements which make out the core of the ontology. The building blocks are value proposition, target customer, distribution channel, relationship, value configuration, capability, partnership, cost structure and revenue model, and they are connected as shown in table 1.

Business Model Ontology

Business Model Area	Element/Building block	Sub-element
Product	Value Proposition	Offering
Customer Interface	Target Customer	Criterion
	Distribution Channel	Link
	Relationship Management	
Infrastructure Management	Capability	Resource
	Value Configuration	Activity
	Partnership Network	
Financial Aspects	Revenue Model	
	Cost Structure	Accounts

Table 1: Business model ontology overwiev

5.2 Product

The major area of the business model ontology is the *Product* area. This area covers all products and services the company offers its respective customers, i.e. the livelihood of the company. In order to succeed companies need to offer products or services of value to its customers, not only by the products themselves, but also compared to competing companies within their market. It can point to why customers should purchase or use their products over the products of a competing company. The product area contains only one element and it's the first of the nine elements, VALUE PROPOSITION.

	Product	

Element/Building block	Sub-Element	Attributes
Value Proposition	Offering	Name {abc}
		Description {abc}
		Reasoning {use, risk, effort}
		Value level {me-too, innovative innovation, excellence innovation}
		Price level {free, economy, market, high-end}
		Life cycle {creation, purchase, use, renewal, transfer}

Table 2: Product pillar overview

5.2.1 Value Proposition

As implied by the name, VALUE PROPOSITION defines how a company's values in form of products and services as well as complementary value-added services are offered to their customers in order to fulfill their needs. It gives an overall view of the bundles of products and services a company offers to one or more CUSTOMER SEGMENTs. The VALUE PROPOSITION element can be further broken down in to OFFERINGs which describes a part of the company's products and services. All the OFFERINGs connected to a company together makes out the VALUE PROPOSITION.

By dividing its bundles of products and services in to separate OFFERINGs a company can get a clear overview over its values and make comparisons with competitors easier, which again lets them make improvements to their products and services on a more detailed level. OFFERINGs are characterized by their attributes *description, reasoning, life cycle, value level* and *price level*.

Description is simply a description of the certain offering.

Reasoning describes why the firm sees the VALUE PROPOSITION or OFFERING as a value for their customers. In other words, why it offers a certain value as a part of its bundle of

products and services. There are three main ways value is created for customers; through *use*, reduction of *risk* or reduction of *effort*.

{Use} Value created through use often comes from usable products covering needs the customers have. As described by Osterwalder (36); *"value is produced when assumed customer value matches perceived customer value after the consumption of a VALUE PROPOSITION or a specific elementary OFFERING."*

{Risk} In this case value is created by reducing the customers risk in one way or another. This can be done by for instance through insurance contracts, buy-back guaranties or extended support, and in those ways reducing customers risks and fears of buying unsatisfactory products, making "bad deals" or usability problems with a specific product.

{Effort}Customer efforts can also be reduced through innovative products which ease their work with acquisition as well as maintenance and training.

Value level is a measurement of the firm's own value level compared to competing businesses and products. Osterwalder introduces a qualitative scale that relates to value offered by competitors instead of a traditional quantitative scale ranging from low to high (36). The measures used are *me-too, innovative imitation, excellence* and *innovation*.

{Me-too} means that the firm's value level is on a similar level as that of its competitors and that their bundle of products and services doesn't differentiate itself in any significant way. Differentiation may still occur through lower prices, which is covered by the *price level* attribute.

{Innovative imitation} is the case where a company imitates an existing VALUE PROPOSITION or OFFERING, but increases its own value by adding innovative elements.

{Excellence} is used when the value is pushed to extremes with high-end products or services. Prices of such products or services are usually very high, but the value is extraordinary. An example is the cars produced by Pagani Automobili, which are high-end supercars custom made for a handful of exclusive customers. Even if is just a car, the quality of all parts and elements exceeds those of almost any other car (37).

{Innovation} means that a company offers a completely new value to its customers, either through a new product or a revolutionary combination of products and services. It is usually seen as a competitive advantage since the company will initially have no directly competing products or services.

Price level looks at the price level of the VALUE PROPOSITION compared to that of competitors. The four presented price levels are *free, economy, market* and *high-end*.

{Free} This level occurs when the company offers its product or services at no charge for the customers, more precisely, without asking for financial compensation. This price level depends on a business model relying on other sources of income, such as advertising or the sales of customer information. One exception to this is open-source software, which is available online for free.

{Economy} This is at the low end of the scale where the company offers its products and services at a lower price than most of its competitors. Being able to offer products to lower prices often implies a lower value level, but it is not a necessary link. Another reason might be a stream-lined production where costs are shaven down and efficiency is higher than that of the competition.

{Market} At this level the company offers its products at a market price, meaning a price which is in line or close to that of competing products. At this level companies often rely on separating themselves from competitors in other ways and through other attributes.

{High-end} This level is at the top of the scale where the prices are high. Products and services on this level are usually luxuries often connected to the {Excellence} level of the *value level* or to new, innovative products. The company stands out through quality and value and can as a result of this charge more for their products.

Life cycle focuses on defining when in its life cycle an OFFERING creates value. The stages where this can occur are at the *value creation,* at the *purchase,* when in *use,* at *renewals* or at *transfers.*

{Value creation} is connected to the customization of products and services, a process customers generally were excluded from earlier. Products and services was usually formed by the company based on market research and historical data, but as a result of the

development within ICT customers can take part in customizing products and take part in the value creation.

{Value purchase} is as the name suggests value created at the purchase of a product or service. This can be done by enhancing the buying experience in different ways. As an example a company can make purchases from their stores easier or quicker than that found at competing companies. Other ways can be innovative price negotiation, excellent contract management, convenient billing options and compelling financing mechanisms. Another step which can be taken is to improve fulfillment, either through online services (e.g. tracking) or delivery (e.g. express, home delivery).

{Value use} is the best known and most usual phase for value creation and it comes from the *use* of the product or service.

{Value renewal} is value created through renewal after or during the consumption of a product. This is useful when the value is used up, expired, obsolescent or dysfunctional and renewal is obtain to e.g. refilling (phone card), renewing (membership), upgrading (machinery) or repairing/servicing (refridgerator) respectively. Renewals can also be achieved through upgrades and additional features or patching of software as an example.

{Value transfer} is the last stage of the life cycle and is where the customer can have value of a product by transferring the value to others. It can occur if the VALUE PROPOSITION has lost value to a person, but still has value for someone else.

5.3 Customer interface

The second area of the ontology is Customer interface which deals with the relationship between the company and its customers. This includes who the company targets with its products and services through the TARGET CUSTOMER element, how they reach these customers through DISTRIBUTION CHANNELs and how they build and maintain a RELATIONSHIP with them after obtaining them as customers. The link between these elements are important in order to understand who the company wants to reach, how they reach them and how they keep them satisfied as customers. The development and rapid

growth of e-businesses makes this area especially important because of the increasing number of ways to reach customers and maintain relationships.

Customer Interface		

Element/Building block	Sub-Element	Attributes
Target Customer	Criterion	Name {abc}
		Description {abc}
Distribution Channel	Link	Name {abc}
		Description {abc}
		Reasoning {Use, Risk, Effort}
		Value Level {Me-too, innovative innovation, excellence, innovation}
		Price Level {Free, economy, market, high-end}
		Customer Buying Cycle {Awareness, evaluation, purchase, after sales}
Relationship Management		Customer Equity Goals {Acquisition, retention, add-on selling}

Table 3: Customer interface pillar overview

5.3.1 Target Customer

TARGET CUSTOMER is the first element in the Customer interface area and the second element in the ontology. It focuses on who the target customer is for the company's VALUE PROPOSITION, in essence which customers they are most attractive to or most interested in reaching. Knowing who the target customer is also helps with deciding which channels are most appropriate and effective for reaching them. The customer can either be consumers (B2C, business-to-consumer) or other businesses (B2B, business-to-business).

Like value propositions are broken down into offerings, TARGET CUSTOMER is usually divided into sets of CRITERIONs. CRITERIONs defines the characteristics of a TARGET CUSTOMER and contains a *name* and a *description*, which needs no further explanation. Typical examples of criterions in relation to customers are age, demographics, location, consumer habits (what the customer buys and where he buys it), image, needs, cravings and so on.

5.3.2 Distribution Channel

DISTRIBUTION CHANNEL is the third ontology element. In order to reach their target customers the company needs to utilize one or more channels which connects their VALUE PROPOSITION with their customers. There are several ways and channels of doing this, both directly through e.g. own sites or sales teams and indirectly through e.g. third party sellers. This element helps in defining a company's strategy for reaching its target customers. The main attribute for DISTRIBUTION CHANNEL is the *customer buying cycle* (CBC)

Customer buying cycle refers to the phases of relationship a company has with a customer, which is awareness, evaluation, purchase and after sales.

{Awareness} is the phase where the customer finds a company's product or VALUE PROPOSITION that fulfills his needs. This can be done through commercials and other advertisements, promotions, public relations and through partnerships. The main thing is making the customer aware of what the company is offering.

{Evaluation} refers to when the customer compares the VALUE PROPOSITION with competing companies. In this phase it's important to provide the customer with sufficient information about the product, but also about relevant factors as the company's other offerings and partnerships. ICT helps providing this information and make it easy accessible, but it might also be necessary to provide help and advice through intelligent systems or from human interaction.

{Purchase} is the transaction phase where the customer has decided to pay for product or service and it includes negotiation, decision, contract, order and tracking, billing and payment and fulfillment. Giving the customers options in these fields and making it easy to accomplish is important. Electronic channels are making these options safe and easy, and they create value through reducing risk and especially effort for customers.

{After sales} is the phase after the transaction is completed. It involves with providing service for customers and building loyalty to the company and product. This includes solving possible problems, providing advice or disposing of the product.

Don't' "forget" the customer after the transaction

Provide additional value through tools, such as electronic manuals, FAQs and customer support

Use ICT for innovative online support solutions

❹ ❶
AFTER SALES   AWARENESS

Get the customer's attention

Attract customers to evaluate the company's value proposition

Get known in the market

Improve the transaction process

Make purchase and fulfillment more convenient for the customer

Create additional value through tools, such as order tracking

PURCHASE   EVALUATION
❸ ❷

Match customer needs with the company's value proposition

Reduce the customer's search costs - inform and advise him and give him access to user communities

Let the customer test the value proposition

Figure 5: Customer buying cycle (36)

A DISTRIBUTION CHANNEL can be divided into LINKs which describes more specific tasks. As mentioned channels can provide value for customers and be included in a company's VALUE PROPOSITION. So LINKs (and then also DISTRIBUTION CHANNELS) inherits the attributes of OFFERING, including *reasoning, value life cycle* (replaces CBC if the link or channel is part of the VALUE PROPOSITION), *value level* and *price level.* In this thesis I have chosen to not divide channels into links since I found the *customer buying cycle* to be sufficient for describing channels.

5.3.3 Relationship Management

RELATIONSHIP MANAGEMENT describes the relationships a company builds with customers and is the fourth element of the ontology. Every interaction a company has with a customer influences the relationship between them. Reaching the customer is essential, but maintaining the relationship is for most businesses important to ensure profit and loyalty from their TARGET CUSTOMERs. The back side is that maintaining such relationships come at a cost and must be considered carefully. The goal is to optimize acquisition of customers, retaining them and gain profits additional sales over time.   The main attribute for RELATIONSHIP MANAGEMENT is *customer equity* which consists of the following customer equity goals.

{Acquisition} is the obtainment of new customers for the company's VALUE PROPOSITION. To be able to live as a company it is necessary to acquire new customers. Customers are also lost to competition or deaths/bankruptcies or can in other ways be somewhat unreliable over time (depending on product or factors as criterions in target customers e.g. age). To acquire customers you have to find out who to target and how to reach them through advertising, which is an expensive ordeal not to be taken lightly.

{Retention} refers to keeping customers over time and creating loyalty or dependency towards the product or company. Retaining customers is usually easier and less expensive than acquisition and is important in order to keep costs down and ensuring sales. Ways of doing this is e.g. loyalty programs (discounts when signing long-term contracts) or high switching costs (loss of value or buy-out fees).

{Add-on selling} is the sales of additional products to existing (retained) customers, often in form of related products. In gaming industry examples are so called addons or expansions to game, but also other games is sold or promoted to existing customers.

RELATIONSHIP MANAGEMENT can be broken down into MECHANISMs, but in this thesis I have found *customer equity goals* to be sufficient in order to describe the relationships of the companies.

5.4 Infrastructure Management

The third area of the business model ontology describes how a company creates value through Infrastructure Management. It looks at what the company needs in order to provide its VALUE PROPOSITION and keep and maintain its CUSTOMER INTERFACE. The capabilities and resources of the business model are described as well as who owns and provides these abilities and how they are linked to each other. This area contains three building blocks; CAPABILITY, VALUE CONFIGURATION and PARTNERSHIP NETWORK.

Infrastructure Management		

Element/Building block	Sub-Element	Attributes
Capability	Resource	Name {abc} Description {abc} Resource Type {Tangible, intangible, human}
Value Configuration	Activity	Name {abc} Description {abc} Activity Level {Primary activity, support activity} Activity Nature - for Value Chain {Inbound logistics, operations, outbound logistics, marketing and sales, service} - for Value Shop {Problem finding and acquisition, problem solving, choice, execution, control and evaluation} - for Value Network {Network promotion and contract management, service provisioning, network infrastructure operation}
Partnership Network		

Table 4: Infrastructure management pillar overview

5.4.1 Capability

CAPABILITY is the fifth element of the ontology. It describes which repeatable actions are found within a company and how they use their assets to create, produce and offer products and services to the market. A company has a set of CAPABILITYies or properties that allows them to provide its VALUE PROPOSITION to its TARGET CUSTOMERS. These CAPABILITYies are divided into the sub-element RESOURCES which are found in the company or through partners. RESOURCES consist of *name, description* and *resource type*.

Resource type defines what type of resource a given resource can be categorized as. There are three such categories; tangible, intangible and human.

{Tangible} refers to equipment and other physical values found in a company. Interior decoration, desks and production equipment are examples of tangible assets.

{Intangible} is used to describe other, non-physical values that might be hard to evaluate in terms of monetary value, but are important to the company. Examples are patents and brands.

{Human} describes the resources available through people-based skills and employees in general. Human resources are in most cases the most important resource. People create both tangible and intangible value.

5.4.2 Value Configuration

VALUE CONFIGURATION, element six, deals with how the company configures its activities and resources in order to create its VALUE PROPOSITION. The main attribute for VALUE CONFIGURATION is *configuration type.*

Configuration type defines which type of configuration is used to create value. Osterwalder presents three different types, value chain, value shop and value network.

{Value chain} is the most typical configuration and is usually used by manufacturing companies where value is created through a step-by-step process turning input into output.

{Value shop} separates itself from value chain by creating new and more optimal solutions for each case rather than tweaking problems and perfecting a reproducible chain of processes. The company tailors products to specific needs and tries to accommodate them.

{Value network} refers to value created through linking people together in a network or making interaction among users available. Each member using the network creates value and the more people connected to each other the higher the value of the network.

VALUE CONFIGURATION is divided into ACTIVITYies that specify specific tasks performed by the company or partnered ACTORs. All ACTIVITYies are connected through the VALUE CONFIGURATION, specifying the links between them. Attributes are *name, description, activity level* and *activity nature.*

Activity level distinguishes between the company's primary activities and their support activities.

{Primary activity} refers to tasks connected to creation of the value proposition, marketing towards customers and delivery of the product or service.

{Support activity} refers to the activities necessary to support or enable primary activities, such as human resource management or procurement.

Activity nature describes the specific primary activities for each of the different *configuration types*.

A **value chain** has the following five primary activities:

{Inbound logistics} refers to tasks such as receiving, storing and disseminating inputs, incoming goods or material, for use.

{Operations} are the activities concerning transformation of inputs into a final product.

{Outbound logistics} is collecting, storing and distributing the product to buyers.

{Marketing and sales} are all activities involved with reaching the customer and providing with a way to purchase the product. It also includes the tasks involved with inducing the customers to buy the product.

{Service} refers to activities dealing with enhancing or maintaining the value of the product.

A **value shop** has these following primary activities:

{Problem finding and acquisition} is tasks connected to discovering problems, reviewing them and finding an approach for solving the problem.

{Problem solving} is activities associated with making, testing and evaluating alternative solutions.

{Choice} deals with making of the decision of which solution to go for.

{Execution} is the execution of the chosen solution, dealing with communicating, organizing and implementing it.

{Control and evaluation} refers to the tasks associated with measuring and evaluating the chosen solution and deciding to what degree it has covered and solved the given problem.

For a **value network** there are three primary activities:

{Network promotion and contract management} contains the activities of promotion towards and inviting of potential customers, selecting customers for admission to the network and also the making, managing and terminating contracts.

{Service provisioning} deals with establishment, sustainment and termination of links between customers and billing for received value.

{Network infrastructure operation} includes tasks connected to running a physical and information infrastructure. Meaning, keeping the network ready for meeting and servicing customer needs.

5.4.3 Partnership network

The PARTNERSHIP NETWORK is the seventh element of the ontology and deals with the partnerships a company involves itself in and which and how activities and resources are distributed and configured amongst them. Partners can coordinate RESOURCES, CAPABILTYies and ACTIVITIES in order to reach mutual goals. PARTNERSHIPs can be further broken down into AGREEMENTs, but in this thesis that level of abstraction isn't necessary.

5.5 Financial Aspects

Financial aspects is the fourth and final area of the business model ontology. It is connected to all the other pillars as financial aspects is a basis for running a business and it is the outcome of the configuration of the other areas. Financial aspects consist of the REVENUE MODEL and COST STRUCTURE of the company. It comprises how the company intends to make money and thus survive as a business.

Element/Building block	Sub-Element	Attributes
Revenue Model	Revenue stream and pricing	Name {abc} Description {abc} Stream type {Selling, lending, licensing, transaction cut, advertising Percentage {123} Pricing method {fixed, differential, market}
Cost Structure	Accounts	Name {abc} Description {abc} Sum {123} Percentage {123}

Table 5: Financial aspects pillar overview

5.5.1 Revenue Model

REVENUE MODEL is the eighth building block of the ontology and measures the company's ability to translate its VALUE PROPOSITION into money and incoming revenue streams. The REVENUE MODEL is divided into different REVENUE STREAMs and PRICING elements. A company will usually try to make as much money as they can and chose pricing and revenue model accordingly. The REVENUE STREAMs and PRICING element deals with *stream types* and *pricing method* which explains what kind of revenue model a company uses and how it prices its products. Instead of using Osterwalders general explanation I have chosen to show the most common and used revenue models in use within the gaming industry today based on own findings and the findings by H. Berg (19). I will also describe the pricing methods found in connection with the revenue models.

Retail sales model is the most usual revenue model on a general basis and is used to describe the sales of retail merchandise. In gaming typical examples of this type of model are classics like Mario Kart for consoles or the coming pc games Darkspore or Portal 2 where you

buy the game once and own the rights to play it from that point on (38) (39). These games are often priced quite high upon release since it's a single purchase covering the developer's expenses and potential profit. These types of games rarely have content updates since there are no new ways of income connected to it. They rather do expansions or sequels for popular games. The price for new releases in retail games are usually around 40-50 EUR depending on the size of the game and factors like brand and developer costs. After time the price is lowered along with the sales going down.

In order to achieve higher or additional profit from retail sales companies often offer additional value in form of extra material in special editions or box sets at higher prices. The company can also give these bonuses in order to achieve higher sales or make the distribution easier, like the mentioned game Darkspore does through its Digital Deluxe Edition (40). By giving the customer additional value on orders in advance, they can predict sales more accurately and attract more new or reluctant customers. These types of differentiation in price or value lets companies take advantage of the different segments of gamers, from hardcore gamers willing to pay more to be first and best to casual gamers who would rather wait for the price to go down before purchasing the game.

Subscription-based revenue model is as the name suggests a model for games that bases itself on subscriptions from its customers providing a periodical source of income. These types of games deliver services that require more from developers in regards to content updates, bug-fixes, up-time customer support and most other areas. By paying at a continuing level, customers demand more and are deemed more important to keep satisfied as dissatisfied customers can cancel their subscription at any time. In order to make this threat less pressuring customers often get substantial discounts for signing and pre-paying long term contracts and as a result being "locked in." Benefits for companies using a subscription-based model are the fact that the need for continuous and regular authentication and validation of the users reducing piracy and that the pricing is usually set at a level making the revenue stream higher than that of one-time purchases (standard retail games).

Subscription-based models often also lead to close relationships between the customers and the company, leading to other benefits for both sides. Through the information given through the subscription and through the use of the game the developer can often analyze its users and use it to their advantage. For example can eager users (churners) be identified which allow for actions toward retaining the potentially most lucrative customers. It also opens for direct and targeted advertising, both for own products as well as for those of partners. A regular income allows for a more accurate estimation of the company's economy and is also beneficial for this type of revenue model.

The downside is as mentioned the work required in order to sustain such a model. To be able to keep customers over time it is necessary to deliver a product that keeps the users satisfied over time, something which requires quite a lot of resources for a game these days. Subscription-based revenue is not suited for all games either since value has to be added and maintained over time.

For the customers, subscriptions are most beneficial for the heaviest users since subscription-fees are usually fixed, giving the hardcore gamers a much lower hourly rate than casual gamers. The challenge then becomes setting the prices at a level not excluding the casual gamers while maximizing profit.

Micro-transaction model is a model often used in social games and browser-based games. It bases itself on selling small, virtual items to their customers. The items sold are usually valuable in the game by giving them advantages in different ways, for example through reducing their time spent on tedious, but necessary, tasks or by increasing their power, wealth or status compared to other users.

The downside of this model is the fact that it is difficult to predict and estimate because of the various needs and wishes of the users. Some users may be inclined to use a lot of money on such items while others may not use anything at all, even over long periods of time. This may also lead to difficulties retaining customers as bought advantages becomes an increasingly important part of the game, making it less enjoyable for casual gamers who spend less money on such benefits. Finding the balance between extra value adding items

people are willing to pay for while keeping the balance of the game, might be a problem within this model.

This type of model also opens for opportunities for reaching and acquiring new customers by for example letting people purchase value adding items by inviting a friend or sending a certain amount of invitations and such, and in that way get their own users to do direct marketing for them.

There are variants of this model that aims at making money on transactions. Some games enable player-to-player transactions, secure these operations and take a cut of every transaction made. This kind of virtual auctioneering or brokering is amongst others found in the banking and economic system within Second Life, something I will come back to in the case studies.

Freemium model is a model that bases itself on hooking customers through free value. By offering a game free of charge they can attract customers in larger numbers and making money through combining the freemium model with other revenue models. The most usual model to use then is the advertising model generating revenue through advertising for external partners through different agreements.

It is also quite usual for games using the freemium model to try to hook users on the game through limited gameplay. By offering trials or free gaming within restricted areas or certain levels they can give customers the taste of the game and letting them relate to it in order to sell them the full version or expansions. If used with baits like big reveals or glimpses of something exciting just at the end of the demo or trial-game it is often successful. Letting people create a personalized character or giving them other things to connect to on a personal level is also an effective trick.

The freemium model can also be combined with the micro-transaction model as mentioned by letting people play for free and make money through virtual items or other transactions. By letting people play for free they have the chance of attracting more customers increasing the number of transactions and building a brand and creating a substantial customer base.

Another form of freeware is making a game for free getting as many users as possible hoping that a large developer or gaming service will buy the rights to the game. As a developer you might lose out on potential revenue on such a plan, but if the idea is good enough a lot of customers/users always draws attention from investors.

Advertisement model is as mentioned based on revenue through advertisement in different ways. The advertising can either be featured in-game or through banners or skyscraper ads found in e.g. browser-based games or in affiliated sites. It can even be full commercials where the entire game is an advert. Cost per thousand views (CPM), cost per click (CPC), cost for a "real" player who plays for a certain amount of time (CPP) and cost per acquisition of a player (CPA) are examples of models used for making money on advertising for external partners/customers (41).

Revenue through advertisement is something that can be added to and combined with most other revenue models. The downside is that it can influence a developer's reputation amongst its customers and become an annoyance if done exceedingly. There are many ways of placing advertisement in games, like giving characters brand clothes or equipment, weaving a company into the storyline or just plain through banners and billboards in-game, making it interesting for many developers.

Pay-for-play model/utility model refers to the old arcade gaming structure where people would pay for a certain amount of time or a given number of lives, balls etc. This type of model can be used for games which have the possibility to control the amount of time or the amount of tries a customer have in the game. An example would be letting people pay for play by the hour online and in that way let customers pay for what they need. This type of model favors casual gamers as they are paying for their actual use instead of paying a middle ground price covering the amount spent by hard core gamers as well.

A Licensing model bases itself on selling licenses to external companies enabling them to sell the game to specific customer segments or entering restricted markets. This model allows

the game developer to keep costs down on distribution and publishing and can help them to reach new customers.

5.5.2 Cost Structure

COST STRUCTURE is the ninth and final building block in the business model ontology. This block measures all the costs related to creating, marketing and delivering a product to the customers. COST STRUCTURE is further broken down into ACCOUNT, which ties each cost to a specific expense.

5.6 Actors

This section identifies all the main actors involved in the business model.

6   Case study - Minecraft

Minecraft is a sandbox-type game which allows players to make an avatar they can use on selfmade or already established multiplayer servers. The avatar can create or destroy various types of blocks in the virtual world, allowing the players to create an endless amount of different structures and creations available for all people connected to the same server.

Markus Persson, the creator of Minecraft, got the idea for the game after playing the Infiniminer which was a small game released around April-May 2009 (42). Infiniminer was intended to be about teams digging for different metals and bringing them to the surface to gain points, but the users quickly found the possibility of building things to be more fun and exciting than competing for points. The developers stopped the development of the game and released the source code and made it public, leading to several spin-offs. Persson enjoyed the building part of the game as well, but found the variation to be lacking and the game to be generally flawed (43). He decided to give it a try and the result of that was Minecraft.

The background of Minecraft makes the game special in compared to usual developments. It was released in May 2009 as an "alpha" release while Persson was developing Minecraft at night while having a regular day job. At this point it was available in what is now called classic mode and was available for free as a browser game. During June 2009 it was made available for sale over the internet. The development of the game continued with several aspects being added, amongst them the survival test which later lead to the survival mode. The game went through several phases, until ending up in beta in December 2010. The game is supposed to be released as a finished game during 2011 and the release date is currently set to 11.11.2011 (44).

In order to cope with the increasing workload Persson founded a company at the same time he released Minecraft and is continuously adding coworkers to the company. Mojang is a self-proclaimed indie developer studio mainly concerned with the running and development of Minecraft, but also developing new games.

Per April 23, 2011 there are over 7 million registered users where 2 million of these have bought the game according to Minecrafts stats page (45). These numbers are also increasing by the day. Minecraft has also won several awards, amongst them game of the year in PcGamer magazine and best indie game of the year in 2010 (46) (47). These numbers and awards make Minecraft a great success and an immensely popular indie game.

The fact that Minecraft started out as a single-person developed game made in spare time makes it a bit special to analyze as a business. Even though Persson has started the company Mojang in order to finish the game and handle the business elements of Minecraft, it originated from a very simple and unorganized background. The Mojang team consists of nine people per May 2011, making it a very small business. As a result, much of what is offered in addition to the game, even some of the official sites connected to Minecraft, are generated and managed by users and fans. This makes it hard to analyze as it is not a clear business model for Minecraft or Mojang, but a result of the background and history of the game. I will try to clarify which parts are offered by Minecraft and Mojang and which are in a somewhat gray area.

6.1 Product

The product section covers all the products and value the company offers its customers. The main product offered by Mojang and Minecraft is the game itself. They also offer some services and support in relation to the game.

6.1.1 Value proposition

Value proposition refers to a certain item or service or value covering a customer need. Minecrafts products consists of three value propositions

Value proposition 1 – Minecraft the Game

The game itself is the core of the value offered to customers, and in this case what the company is built up around. It offers entertainment through a single and multiplayer

sandbox game where customers can create own content, interact with other players and the computed environment. The game as a value proposition can be broken down into elementary offerings.

Offering 1: Survival mode gameplay

Survival mode was the second released mode of play, but is the main offering to customers at this moment. It allows people to enter the virtual world and play against in-game challenges or other players in order to survive.

Reasoning: {use}. This offering creates value for customers through entertainment while they are playing the game. It covers needs for excitement, exploration and entertainment.

Value level: {innovative imitation}. As mentioned, Minecraft is built on an already existing game using existing code. The value in Minecraft - Survival compared to other similar games lies in the addition of good ideas in concept and gameplay. This separates it from earlier games and other competing games

Price level: {Economy}. At the moment the price of Minecraft is low compared to most released games. The problem with defining this is that it is still under development and not released as a finished game. The price has also increased along with the development stages and it is assumed to end up at about market price as a finished game.

Life cycle: {value use}. The value for survival mode gameplay for the customers is through the use of the offering.

Offering 2: Classic creative mode gameplay

Classic creative mode is the name given to the original mode of the game created at the origin of Minecraft. In this mode people are able to enter a virtual sandbox world and create whatever they want with an infinite amount of in-game resources (building blocks). Classic mode is offered in both single player and multiplayer variations. As of now classic mode is offered to customers, but only for nostalgic reasons according to the developers. It is going to be phased out over time (48).

Reasoning: {use}. Value is created through use of the product.

Value level: {innovative imitation}. Based on earlier games, but with additional functionality to separate it from competitors.

Price level: {free}. Classic creative mode is offered for free through Minecrafts website, although labeled as outdated.

Life cycle: {value use}.

Offering 3: Online digital download

The game is offered through digital download on Minecrafts website and can be bought online and only online. Through the website customers can download a stand-alone launcher for the game. All updates and additional value are given online as well. Minecraft also offers downloadable server software for customers wanting to set up a server for play of their own.

Reasoning: {effort, risk}. Reduces customers efforts through making everything available online from the customers home. Also reduces risk by removing the chance for losing disks or any physical part of the game.

Value level: {me too}. On par with other competing customers.

Price level: {free}.

Life cycle: {purchase}. Online downloads creates value at the purchase phase by making the game easy accessible and reducing customer efforts.

Offering 4: Browser based play

In addition to offering the game as a digital download Minecraft is available for play in the customers browser. Letting them access the game from any computer connected to the internet and with updated java-support.

Reasoning: {effort, use}. Reduces customer efforts by saving them the time and trouble of downloading and installing the game. Also makes the game more accessible from different computers.

Value level: {me-too}

Price level: {free}

Life cycle: {use}

Offering 5: Account Management and services

Minecraft lets its customers log in and access their account information. At the moment it is limited to changing of password and a possibility to create an own character skin based on a reference skin. Which mean a possibility to customize their characters.

Reasoning: {effort, risk, use}. The possibility of changing account settings through the webpage makes it easier and faster for customers to have control over their account. In addition it helps them to secure their own account and avoid compromising their accounts reducing risk of losing control over personal information. The customization of character skin makes the playing experience more enjoyable during use.

Value level: {me-too}.

Price level: {free}.

Life cycle: {creation, use}.

Offering 6: Modifications

Minecraft opens for individually added modifications for users, allowing them to make additions to the game at some levels. At this moment, mods is not officially supported by Minecraft, but is planned to be official relatively soon. Minecraft will provide an official modding API including the entire source code of Minecraft, allowing licensed users to develop mods for the game (49). Most mods available and frequently used at this time alter the looks or behavior of existing, official items, but there are made mods that alter gameplay and adds functionality. These mods are made available to users through the Minecraft community.

Reasoning: {use}. The mods makes the game more interesting for the customers and contributes to the development of the game.

Value level: {innovative imitation}. This kind of offering can be found in other games, but not in the extent of what is possible in Minecraft. The idea of licensing official modders amongst customers and giving them access to the source code is innovative for a game at that scale of sales.

Price level: {free}.

Life cycle: {creation, use}

Offering 7: Support

Minecraft through Markus Persson and now the connected company Mojang offers support to its customers, helping them with problems that arise connected to the game. Possible problems include account problems, billing problems, in-game bugs or other questions. The support is offered through the community where Persson and Mojang employees answer questions and provide guides either themselves or through user-contributed material.

Reasoning: {risk, use, effort}. The community support helps customers with problems that arise reducing the time it would take to work around it or solve it on their own. It also reduces the risk of doing things wrong or creating additional problems. In addition it provides understanding and help with the gameplay which can increase the enjoyment of playing.

Value level: {me-too}. On par with competing companies.

Price level: {free}.

Life cycle: {creation, purchase, use, renewal}.

Offering 8: Security

Minecraft offers security to its customers through account and password control and secure payments. Since the game is obtainable only through online purchase it is important for

them to offer secure lines of monetary exchange. They also offer software solutions to avoid hacking and other forms of cheating and to provide a safe game environment for customers.

Reasoning: {risk}.

Value level: {me-too}.

Price level: {free}.

Life cycle: {use}.

Value proposition 2 – Community

The community connected to Minecraft is the second value proposition of the game. It consists of several different channels offering information and support on different aspects of the game. Through community sites Persson and Mojang can give customers relevant information and updates and communicate with users. The users can share ideas, tips, thoughts and other relevant or irrelevant material with other users and get feedback from others as well as from game officials.

Offering 1: Blog

Since the start of Minecraft the main source of information on the development of the game and all other aspects of the game has been the blog of creator Markus Persson. Through his blog, The Word of Notch (Notch is his nickname online), Persson has kept his customers updated on development, answered questions and shared ideas, making it the most official and direct source of information.

Reasoning: {risk, effort, use}. By offering information on all aspects of the game the blog helps customers avoid risk through bug reporting and reduces efforts by making the most important messages available through one source. In addition the blog provides tips and information contributing to the use of the game.

Value level: {innovative imitation}. Creating game blogs as information sources is not new or innovative, but the level of information and directness through a personal blog is quite rare and innovative for a game at this level.

Price level: {free}.

Life cycle: {use}.

Offering 2: Forums

There are several forums involving and covering several aspects of Minecraft giving the customers opportunities to meet other users and discuss all areas of the game. What is special about these forums is that none of them are hosted by Minecraft or Mojang, even those listed under official resources at Minecrafts webpages. This makes it hard to define as an offering from the game developers, but I have chosen to mention it since it is directly linked to from their webpage and Markus Persson and other Mojang employees use the forums actively. The background and development of the game probably didn't leave much focus for community-building and third-party community sites were developed by users out of interest and necessity before Persson and Mojang had reached that point in the creation of the game. Minecraft only took advantage of these sites and made them official in order to offer this service up to the point of creation of self-run forums. Something the establishment of Mojangs GetSatisfaction-site is showing.

The GetSatisfaction-site was started in November 2010 by Persson and is a third-party hosted community site where Mojang pays a monthly fee for the use of established tools. The site was established in order to structure bug reporting and get ideas and feedback from the community [http://notch.tumblr.com/post/1727680340/bug-fixing-made-fun]. Other community sites include a Minecraft Facebook-page, a community-run Wiki-page and several other forum-sites in different languages. In addition the Mojang employees have Twitter-accounts available for all willing followers.

Reasoning: {use}.

Value level: {me-too}.

Price level: {free}.

Life cycle: {use}.

Offering 3: Physical items and merchandise

Through cooperation with other companies Minecraft offers clothing to its customers. They landed a merchandise deal with a company in March 2011 establishing a official Minecraft merchandise store (50) (51).

Reasoning: {use}.

Value level: {me-too}.

Price level: {market}.

Life cycle: {use}.

6.2 Customer interface

This chapter deals with Minecrafts target customers, how these customers are reached and how the relationships with them are established and maintained. This is described through three building blocks; target customer, distribution channel and relationship management.

6.2.1 Target customer

As mentioned, this block deals with which customers Minecraft wants to reach with its value propositions. I have identified three different users targeted by Minecraft.

Target customer 1: Gamers

This group of customers is the ordinary gamers. Consisting of people of different ages, sexes and locations interested in playing computer games for entertainment. The game offers possibilities and fun for casual gamers playing just an hour a week as well as for more

hardcore gamers playing several hours a day. Minecraft doesn't offer anything extra to hardcore gamers, but provide enough possibilities for them to keep playing.

Target customer 2: Modders/developers

These customers are a sub group of gamers since they are gamers as well, but they separate themselves by their interest in the game. By making modifications of the game itself Minecraft attracts people interested in developing and customizing their experience. The coming introduction of official modder licenses will give people the chance to creating something useful and have it licensed by Minecraft and included in the game.

Target customer 3: Artists

This group is also a sub-group of gamers. Some people are attracted to the creative aspects of the game allowing customers to create almost anything. Through collaborations, massive time use or scripts people create impressive artwork e.g. in-game replicas of real world items. There are own threads in the forums dedicated to artworks and pictures giving users the possibility to show their work. User-made competitions are also found to create interest and motivation. In addition some users use Minecraft art for other purposes, like for original content on humor, sites which I will come back to later.

Figure 6: Taj Mahal replica made in-game in Minecraft

6.2.2 Distribution Channel

In order to reach its target customers Minecraft needs to utilize distribution channels, connecting their value proposition to their customers. This block covers both how Minecraft is marketed to potential customers and how the value proposition is offered. I also show where in the *customer buying cycle* (CBC) the channels are active.

Distribution channel 1: www.minecraft.net

Minecrafts websites is the main and most important distribution channel. It offers the game both for download and browser-based play, possibilities for online purchase, sale of merchandise, links to community sites and information on support and troubleshooting.

Customer buying cycle: {awareness, evaluation, purchase, after sales}.

Distribution channel 2: www.mojang.com

Mojang is the owner of Minecraft and offers links to Minecraft and Minecraft merchandise. It also provides information on how to contact Mojang and shows the latest Twitter-messages from all Mojang employees.

Customer buying cycle: {awareness, after sales}.

Distribution channel 3: www.jinx.com/minecraft

Minecrafts official merchandise store offered through a partnering online clothes company, Jinx. Through this site Minecraft clothes are offered customers in addition to ordinary service connected to online purchases.

Customer buying cycle: {awareness, purchase, evaluation, after sales}.

Distribution channel 4: Media

Minecraft has received some media coverage through several gaming sites as well as through bigger newspapers and tv-shows throughout its lifetime. Many of the coverings have been reviews of the game, but also some interviews with Persson or other articles in association with awards or other parts of the games success. A documentary on Persson and the background of Minecraft is currently being made, something also creating interest and provides advertising even before it is released (52).

Customer buying cycle: {awareness}.

Distribution channel 5: Social sites and media

Persson and the rest of the Mojang employees are as mentioned active on the service Twitter where they can be followed in addition to Perssons blog. Minecraft also has a

Facebook page. A search for Minecraft on Youtube also gives several thousand hits, including the videos featured as official starter guides at Minecrafts webpages.

Customer buying cycle: {awareness, evaluation, after sales}.

Distribution channel 6: Community sites and other affiliated sites

The community sites are in most cases not used directly by Minecraft or Mojang in order to reach customers as they are driven by users and the community itself, but I have chosen to include it since they are important when it comes to the marketing if this sort of game. Minecraft has relied on word-of-mouth marketing and community sites are essential in reaching people.

An example of word-of-mouth advertising is the way I heard about the game myself. It was through a humor site called Funnyjunk where users add the content. A Minecraft trend started where pictures and jokes where made in Minecraft and posted at this site and in that way telling all the users of that particular site about Minecraft (the trend eventually lead to dedicated Funnyjunk Minecraft-servers where users of funnyjunk could play Minecraft together.) According to statistics the Funnyjunk site has about 10 million page views a day, making it and similar sites a powerful marketing tool [http://funnyjunk.com/stat/last7day/].

Customer buying cycle: {awareness, evaluation}.
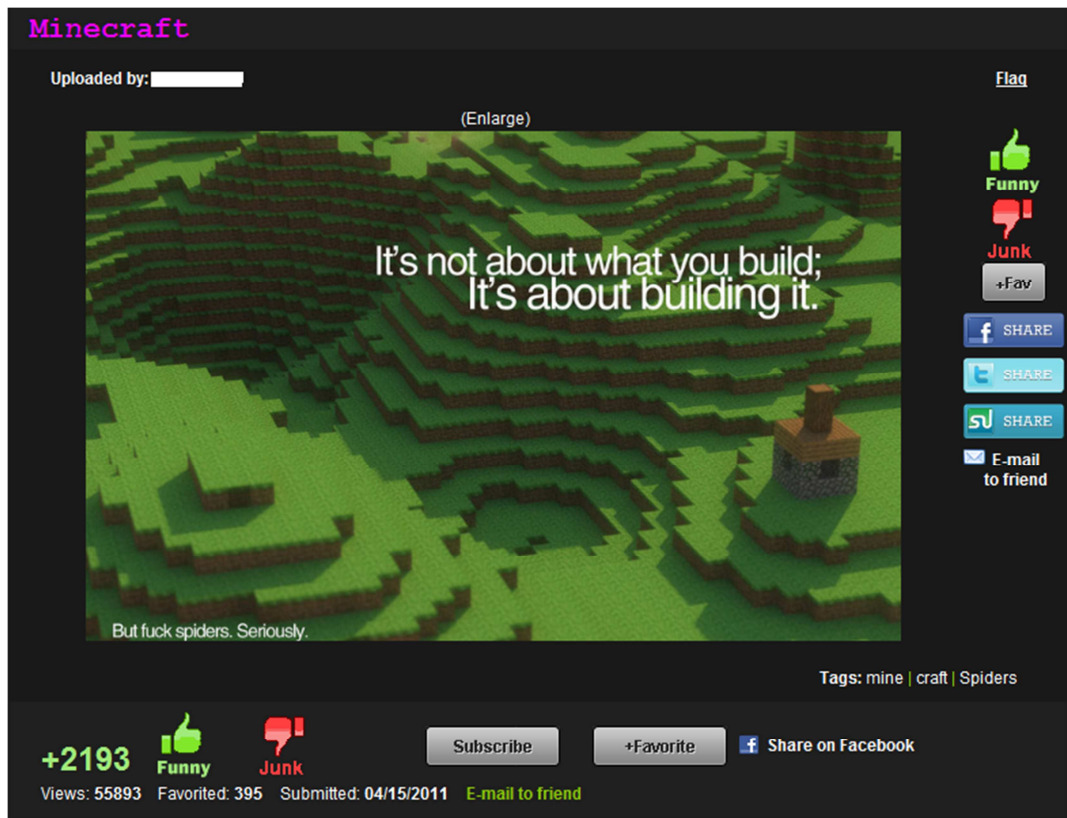
6.2.3 Relationship Management

This block describes how Minecraft maintains its relationship with its customers divided into two phases; acquisition and retention. The different customers have different needs and are handled in different ways in order to provide them with a good product and retain them as customers.

Acquisition. In order to acquire new customers companies need to reach their customers and make them aware of their value proposition. In relation to that marketing is a vital part and is usually done by advertising and promotions. Minecraft haven't had any advertising or promotion campaigns in order to reach customers, but has reached a lot of people through word of mouth. As mentioned, most of Minecrafts marketing is done through social networks like Facebook, blogs and Twitter or through communities like forums, communities and other internet sites and is a job performed by users and existing customers. The advantage of this method is that it can attract people quickly and make them customers

since the source is reliable (friends, trusted forum-posters). The down side is that they are uncertain and difficult to utilize consciously in order to get the ball rolling.

Minecraft has had great success and is experiencing a lot of acquisition of customers, but it is not likely that it was a planned chain of events and use of distribution channels. Even though Persson, and now the rest of the Mojang team, were and are active in several of the mentioned areas most of their marketing success has come as a result of eager and satisfied customers and a bit of luck with the concept. Minecraft provides its customers with the possibility of giving the game away as gifts to friends and family, which proves that the team knows where their acquisition comes from and that they are eager to keep the ball rolling. This shows that a good product is a vital part of acquisition of customers. They also offer discounts in the form of getting the beta-version cheaper than the price set for the full version of the game while still getting the full game at release in November. It acts as a buy now, quickly and save money-deal aiming at attracting the insecure users into full customers.

Retention. In order to maintain customers over time it is important to keep the users happy. Minecraft does not have any form of expansion coming and bases itself on one-time sales, something that means that acquisition of new customers is the most important thing in terms of income. But as mentioned, since Minecrafts gets their customers from word of mouth and customers recruiting friends its essential to keep them happy and to keep them playing. Since most of the community and support system around Minecraft is user driven it is also vital to keep old, experienced players active in order to drive the community forward and provide help and guidance for new customers.

The way Minecraft secures retention is through extensive feedback to the customers and the communities by providing information on updates and answering questions on bugs, problems and other questions in general. Being a game developed by a single person it might lack a little in the amount of support available at all times, even now with eight additional employees in Mojang, but the customers instead get in-depth information and details about the development and the game itself. Minecraft also supports in-game chatting and, as a result of that, the creation of clans. This is important since many friends already

play together and get a social area for interaction through the game. This part is important for all gamers and users of Minecraft.

Another important retention tool is the customization of skins/characters and the fact that creations are saved and connected to the users account. Customers put in substantial time in their character and especially their creations and work in-game.

The introduction of official modding licenses and promise of release of the full source code is a way of keeping the modders interested and retaining an important part of the hardcore and most knowledgeable customers. By tying them to Mojang and Minecraft through a license they can secure rights to important and well-made additions to the game and take advantage of user-contributed material while keeping these people interested in doing the work.

In order of keeping the artists satisfied they have kept the classic creative mode available. They also expand the game in terms of possibilities and types of blocks available for building. In addition the communities provide environments for people to display their works and get feedback in addition to competitions and challenges.

All these developments and aspects secures retention and provides an interesting environment for customers making sure they keep playing the game and contributing to the gaming experience and the quality of the game. The goal is to create an environment with high-switching costs, making it hard for users to quit the game or switch to competitors, either through loss of the social arena, promising exciting updates and additions or through the loss felt when they walk away from their character and the work they have put in to the game.

Add-on selling. The last area of relationship management is connected to add-on selling of other games and related products from the developers. In this case Mojang haven't got any finished game as the company was built up around Minecraft, but there are potential for advertisement towards Minecraft users at a later point in time. As mentioned Mojang has come with a line of clothes for sale offered through their webpages in association with their partners.

6.3 Infrastructure Management

Infrastructure management deals with which resources is needed for Minecraft to provide its value proposition and maintain its customer interface, and how these resources are handled. It consists of capabilities and resources, found both in-house as well as acquired through partners, needed to produce value.

6.3.1 Capability

Capabilities refers to repeatable actions are found in the company and how assets are used to offer products and services to the market. In order to offer Minecrafts value proposition I have identified a set of capabilities with connected resources needed.

Capability 1: Creating and developing an interesting game

The most important capability for Minecraft is to develop a game with appeal for a customer market. By having attractive ideas and being able to develop a quality game Persson and Mojang can provide an interesting value proposition and attract customers. In order to achieve this Minecraft has a certain set of resources available.

Resource 1: Developers.

Markus Persson was the driving force behind the game taking of his spare time in order to put his ideas into life and building a brand around it. In addition Persson is building up a team of enthusiastic and talented people to develop and finish the game, something that is essential in order to deliver a good product to customers. - {Human resources}

Resource 2: Rights

Persson and Mojang owns the rights to Minecraft and the ideas around gameplay found from the ideas gotten from Infiniminer. Even though the game was inspired by Infiniminer Mojang owns all the rights to the game now, securing them all income generated from the game and rights its source code. - {Intangibles}

Resource 3: Funds and assets

In the beginning the equipment used for developing the game was personal

equipment located in private property. Through sales of alpha and beta versions of the game Persson and Mojang has been able to build up funds to invest in the development and maintenance of the game by recruiting people and spending more work-hours on the game in addition to purchasing equipment and office spaces needed for employees. - {Tangibles}

Capability 2: Maintaining a good gaming experience

In order to keep customers happy and provide a good product over time Mojang has to have a possibility to support and assists customers with problems and bugs. They also keep the websites up and available making sure customers can take advantage of the possibility of browser-based play, download the game launcher and find help through guides or support. It is also necessary to acquire new customers to the game and the community. Minecraft does this through its main site and community site and this capability is decomposed in to the following resources:

Resource 1: Support
Through forums, blogs and sites Mojang employees offer support and provide help to customers in need. - {Human resources}.

Resource 2: Network infrastructure and equipment
Keeping sites up to assure that customers can access the game and server-software in order to play the game by maintaining their web code, paying their services providers and dimensioning for the increasing traffic. - {Tangibles}

Capability 3: Attract customers

Minecraft attracts customers mainly through creating a good game and word of mouth as a result of that, but they also utilize channels like twitter, facebook and community-sites in order to collect information, create tailored value and market the game.

Resource 1: Community activity
Mojang employees are active in the community picking up information on trends and developments among users helping them get ideas for development in the game and possibly attracting more customers. They also answer questions and provide

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information for people interested in the game and in that way marketing the game, increasing chances for acquiring customers. - {Human resources}

Resource 2: Brand building

Minecraft utilizes the popularity of the game and the status of its brand by making additional products like clothing and apparel to increase their income, reach more people and further develop the power of their brand. - {Intangible}

6.3.2 Value configuration

Minecrafts value configuration describes how they configure their activities and resources in order to create the value proposition they offer the customers, in this case divided in the categories value chain, value shop and value network. Also for this point Minecrafts origins makes it a little bit special as it was developed by a single person. The company, Mojang, which rose from the game, can in a general sense be seen as a value chain as it plans, develops and publishes games in a step-by-step order like other publishing companies. Something which can probably be said about the development of Minecraft as well since Persson had a plan of developing a game and publishing it. In addition Persson has done a lot to keep costs at a minimum while delivering a good product to a large customer base, something also typical for value chains. Minecraft does also contain elements found in a value shop because of the way the development is done. Persson and Mojang try to reach the best solutions through developing solutions and testing them in a somewhat iterative manner in order to reach the best possible solutions for the customers. The Mojang team also continuously makes changes in already released material to optimize it. What separates it from classic value shops is that solutions aren't tailor made for specific customers, but made with the goal of satisfying as many customers as possible.

Despite the traits mentioned Minecraft is mainly defined as a value network as it connects people with similar interests through a community facilitating creativity and socialization with friends. The game ties gamers together and is supported by a strong community essential to the game's success. By letting users interact in the game, contribute with feedback and come with suggestions they also achieve marketing through word of mouth and acquisition of new customers. Minecrafts marketing strategy is based upon creating a

value network and utilizing it. There are three primary activities connected to having a value network configuration, namely *network promotion and contract management, service provisioning* and *network infrastructure operation.*

{Network promotion and contract management}

In association with this main activity Mojang and Perssons tasks are the following:

Activity 1 – Sell games

The most important activity for Mojang is to sell games to customers. By acquiring new customers they add value to their network with interested users contributing time and effort in-game. They also increase the number of people they can reach through word-of-mouth marketing as new users recruit friends if they are satisfied with the game.

Activity 2 – Promotion

An important part of increasing the value of the network is promoting the game through community sites, forums, blogs, social sites and media articles. It is important for Persson and other Mojang employees to create attention around the game by talking about in available channels and being available for interviews.

Activity 3 – Acquiring and maintaining partners

It's essential for Mojang to utilize partnerships in order to provide the value the game and network offers. To achieve this they have to rely on partners.

{Service provisioning}

Activity 4 – Maintaining and developing an interesting gaming experience

Creating and maintaining a strong and valuable network would be hard without an interesting game satisfying the customer demands. This also includes keeping server software up to date to ensure that the multiplayer functions remain available.

Activity 5 – Maintaining support and bugreporting

Keeping customers happy is important making support necessary. It also helps correcting errors and making sure network links are up.

Activity 6 – Providing DLC

A main activity is also to keep updates and fixes available online reducing customer efforts and making sure their pages are frequently visited.

{Infrastructure operation}

Activity 7 – Maintaining infrastructure

In order to keep the services offered available the network provides the back-end infrastructure needs to be maintained and scaled to needs. This needs to be done either by maintaining the partnerships to companies providing the service or through a team of their own if they eventually host the sites and data themselves.

6.3.3 Partnership network

Partnerships are quite important in order for Minecraft to offer all parts of their value proposition to its customers. Being a one-man operation from the start Persson had to rely on partners in many aspects of the business model of Minecraft. In the beginning, being a small and virtually unknown indie game, the needs for partners were not as big and its appeal was quite small. Over time Minecraft has grown to a large game, interesting for many external partners. Some of the partners are loosely connected to Minecraft while others have a more official role. The partnerships listed below are the most important ones per June 2011.

Partnership 1 – Hosting and transferring service

In order to be able to provide the game to a substantial user base and handle large amounts of traffic without delays and similar problems Minecraft is dependent on reliable hosting with sufficient capacity. Establishing and hosting such a service on their own would be expensive and impractical, so they rely on external hosting services for this part of their business.

Partnership 2 – Transaction services

Handling payments in a secure way is important when it comes to security and trust for both sides of the transaction. To provide customers with such secure options to pay for the game Minecraft relies on partners specializing in this area of their business.

Partnership 3 – Retail online stores

In order to reach customers with Minecraft merchandise they utilize established online stores through partnerships.

Partnership 4 – Community hosting

Minecraft uses externally hosted and run community sites to provide support and get feedback from customers. In addition they have community and support sites run by partnering companies and users although these partnerships are loose since they to some degree lack clear agreements. I have still chosen to mention user run community sites under partnerships as I find them to be an important part of Minecrafts value and the work with the users running the site in order to

6.4 Financial Aspects

The final area deals with how Persson and Mojang make money on the game and the costs connected to the game.

6.4.1 Revenue Model

From the release of the game Minecraft was presented as a free game, available for anyone willing to play it. At this early stage the game was small and buggy as it hadn't been under development for a long time and getting paid for it might have been hard. Despite this Persson introduced the possibility for pre-purchases a month after release promising to keep the free version available up until the release of the game, but offering extended services and discounts to paying customers (54). The revenue model based itself on offering an incomplete game for a lower price on the promise of developing it further and creating an exciting game in the future, stating that paying customers would get all future updates without paying any more. The price for the game would be increased during the development. The pricing would be as follows:

- Alpha stage – € 9,95 . Introduced 13.06.2009 (55)

- Beta stage – € 14,95. Introduced 20.12.2010 (56)

- Full version – € 20. To be released 11.11.2011 (44)

This is a typical retail sales model based on single purchases at relatively high prices. Even though 10 or 15 euros seem quite cheap it is in fact quite high considering the fact that it is for an unfinished product. Defining this pricing model as differentiated is not entirely accurate since it doesn't differ between customer segments, but it provides a discount for people willing to pay for a game under development and the annoyances associated with that. Another part of their revenue from retail sales are acquired through sales of merchandise, but that is a very new and small part of their revenue which was hard to find number on. Because of this I chose to not include it in my calculations even if it might be an increasing source of income for Mojang over time.

In addition to the retail sales Persson has offered a free version of the game available for people wanting to try the game or people not willing or able to pay, and in that way combined a retail sales model with a freemium model . The free version, Classic Mode, is a limited part of the game and it lacks much compared to the full version (currently Survival Mode beta), but it still lets people experience the gameplay and is valuable when it comes to hooking customers.

It should also be mentioned that Persson for a brief period of time used advertisement as a source of revenue, but quickly removed it stating that it was mostly beneficial for the advertisers, not making him much money while being an annoyance for customers (57) (58) (59).

When it comes to the actual revenue for Minecraft the openness Persson has had through the development of the game has allowed me to retrieve some information on essential numbers. Through the website Minecraft offers a daily update of sales and registration, providing information on total number of registered accounts, total number of purchases, number of registrations last 24 hours and number of purchases last 24 hours, on a separate statistics page (45). How accurate this site is when it comes to reporting real numbers is uncertain as it is offered my Mojang itself and can be used to influence customers by extending the size of their customer base, but I have found no indications on the numbers

being fake or altered and have chosen to use them for my estimation. Per June 6, 2011, Minecraft claims to have sold 2,434,327 games.
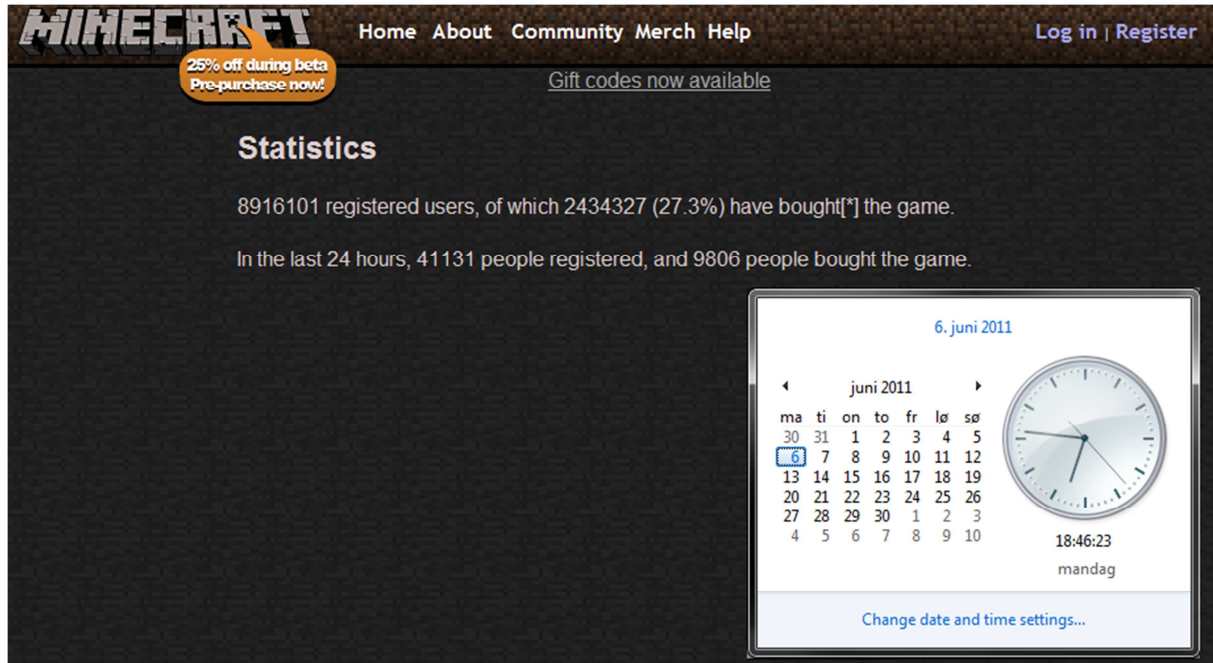
Figure 8: Minecraft sale statistics retrieved from www.minecraft.net/stats

I have no exact number on how many sales where completed before the price increased due to the beta-release, but in answering a question on reddit Persson stated that Minecraft had sold about 800,000 copies of the game up until beta (60). According to data gathered from the statistics page on Minecraft.net by a third party 842,554 sales had been made December 20. 2010 (61). In order to underestimate the revenue I have chosen to use 850,000 copies for calculating the sales before beta to account for uncertainty in the data found and other factors.

An estimation on income through retail sales up to this point would then be:

$$850,000 \text{ copies } \times 9{,}95 \text{ €/copy} = € 8{,}457{,}500$$

In addition comes the sales made during beta up to this point:

75

$$(2{,}434{,}327 \text{ copies} - 850{,}000 \text{ copies}) \times 14{,}95\,\frac{\text{euros}}{\text{copy}} \approx \text{€}23{,}685{,}000$$

Making the total estimated revenue from retail sales of Minecraft:

$$\text{€}\,8{,}457{,}500 + \text{€}\,23{,}685{,}000 = \text{€}\,32{,}142{,}500$$

The results show revenues exceeding 32 million euros with the pricing model Minecraft has chosen to use up to this point. The increase in sales despite of the price increase after the beta release might suggest that the pricing has been slightly low compared to what would have been possible in order to optimize revenue.

Minecraft also as mentioned offer merchandise to its customers through partnerships, but it is recently started and it was hard to find numbers on the sales (51). I have chosen to leave it out of the calculation as it is a very small part of their revenue up to this point.

6.4.2 Cost Structure

The final block aims at describing the costs connected to Minecraft in order to creating, marketing and providing the game to customers. Numbers and data on costs are hard to find for Minecraft, like for other games, since it is not usual to reveal details in a competitive market. Even though the information provided through official blogs, announcements and interviews made by Persson and other Mojang employees provide information making estimations possible, presenting accurate costs for Mojang and Minecraft would be almost impossible for people not directly involved in the game.

Based on the information I was able to obtain I present some estimates on the costs found in association with the game. The information was collected through thorough research of posts made by Mojang employees on community sites, blogs, in interviews and social media as I was unable to contact them in order to get direct information. In addition to this I use

own experiences from the game in order to reach estimated numbers. I have identified the following accounts connected to the main expenditures:

6.4.2.1 Storage and bandwidth costs

The most important expenses connected to keeping the game available to the customers are the costs for storage and data transfer. By not hosting game servers for survival mode themselves and letting users or communities host these, they save a lot on bandwidth and storage costs. They also let users host community sites like forums and wikipages. In spite of this they still have costs with saving account and game information and transferring data in association with browser based game sessions.

As shown above Minecraft has almost 9 million registered users per June 2009. In order to overestimate the storage needed I have calculated that each account amounts to 5 MB of data. This data contains user information as well as user statistics and saved games from gaming sessions. In this number I include the game and server files and other data. The amount of data needing storage is then

$$\frac{9,000,000 \ users \ \times 5 \ Mb}{1024 \ MB/GB} \approx 44,000 \ GB.$$

Persson announced on his blog that they were going to use Amazon S3 in order to host and provide the data for the customers in September 2010 (62). The amount of data needing storage and transfer haven't been as big as it is now through the history of the game either, but I have chosen to calculate the costs for storing and hosting this amount of data for a year, since I am certain that that will supersede the total cost Persson and Mojang has had in this area since the start of the game. The cost of storing data on Amazon S3 scales with the increasing amount of data stored, but the amount can be calculated with their price calculator showing a monthly bill of approximately $ 5,500 for storing 44,000 GB (63) (64). The total yearly storage costs are then

$$\$5,500 \times 12\ months \ x\ 0{,}70 \approx \ € \ 46{,}000$$

with an exchange rate from dollars to euro of 0,70 (65).

When calculating the bandwidth costs I looked at the games started within a day based on gathered information. In the middle of January 2011, when the game passed one million purchases, it was recorded approximately 1,5 million games started of Survival Mode and Classic Creative Mode combined (61). At the time the user base was substantially lower with under 3,5 million registered accounts compared to the nine million accounts in June. It would then be safe to assume that more games were opened from that day up until June, but also that fewer games were opened in average before that point. Many of the games started are also hosted by users and not played in a browser reducing the amount of data transferred from the Amazon servers. As a result of this I chose to calculate with 2 million games started each day for a year, covering the games and data transferred since the start. I have set each game started to transfer 10 MB of data, both out and in. I tried setting up a gaming server for Minecraft myself in order to measure the amount of data transferred, but the results were varied and hard to obtain accurate numbers on. Despite being inconclusive, the results showed me that an amount of 10 MB per game on average would be an overestimation. I have also chosen to calculate for a years worth of costs to cover the data transfers and bandwidth needed for the two year history of the game. The costs for data transfer in and out of the Amazon servers are \$0,08 per GB per month out and \$0,10 per GB in (63). Based on these numbers the estimated transfer costs for a year for Minecraft would be

$$\frac{2{,}000{,}000\ gamesessions\ \times 10\dfrac{MB}{game}}{1024 MB/GB} \times 365\ days \times \$0{,}08\ /GB \times 0{,}70\ \approx\ € \ 400{,}000$$

for outgoing data and

$$\frac{2{,}000{,}000 \; gamesessions \;\times\; 10\,\dfrac{MB}{game}}{1024 MB/GB} \;\times\; 365 \; days \times \$0{,}10 \; /GB \times 0{,}70 \;\approx\; €\,500{,}000$$

for in going data, totaling to € 900,000 in transfer costs for Persson and Mojang.

I could also look into the bug-reporting site used by Minecraft in order to receive and handle bugs, but as this site web service hosted by a third party at a fixed price I have chosen to leave it out of the equation (66). The fact that the maximum cost for Mojang linked to this site would be about €3,000 a year makes it quite insignificant in the total amount as well (67). All other community and support sites are to my knowledge hosted by users or external actors at no or minimum costs to Mojang.

6.4.2.2 Transaction costs

In order to sell Minecraft Persson created a PayPal account and formed a partnership with them in order to handle the transaction of money. In order to do this PayPal takes 1,9% +€ 0,35   for each transaction over borders within the EU (68). There are slightly different fees for transaction originating from outside EU countries so in order to compensate for this I have chosen to calculate with the low rate, but with the transaction amount of € 14,95 for all purchases. For the games sold for € 9,95 the fee would be slightly lower, but without knowing where all transactions originate from I risk underestimating it. By calculating it with these numbers I reach what I believe is a reasonably precise estimate on the high end, thus slightly overestimating the cost.

$$(€\,14{,}95 \;\; \times 1{,}9\,\%) + €\,0{,}35 \;\approx\; €\,0{,}65.$$

Which gives

$$2{,}434{,}327 \; copies \;\times €\,0{,}65 \approx €\,1{,}580{,}000$$

as a total cost this far connected to the transaction part of the sales.

6.4.2.3 Salary costs

The second fixed cost is salaries for the Mojang employees. As of now Mojang has nine employees working in Stockholm, Sweden (69). For salaries in Stockholm 70,000 € annually is deemed a pretty good wage within computer industries (70). To find the total costs I have estimated the total months of work used by Mojang employees. Markus Persson has used approximately 24 months on the game since the release in May 2009. In September 2010 Persson hired two new coworkers which up to this point have worked nine months each for Mojang. From December 1. 2010 there were five employees in all and from January 1. 2011 they were seven, together putting in 22 months of work. One of the last two employees started Februar 21. 2011, and the last employee started about the same time without me being able to pinpoint exactly when (71). I decided to account three months each to them, making the total months spent on Minecraft 70. The expenses connected to salaries is then

$$\frac{€\ 70,000}{12\ months} \times 70\ months \approx €\ 410,000$$

6.4.2.4 Office rental

The third cost I have identified is rental costs for office spaces. Rental prices for office spaces in Stockholm, where Mojang has its offices, are high and for prime locations the price is up at SEK 4000 per square meter per year (72). This amounts to approximately €440 per square meter. A good sized office for a nine man business would be 200 m^2 and to overestimate I calculate a year of office rental to account for the expenses Persson had with having his office at home and the temporary locations used after forming Mojang, even if they didn't move in to new offices before January 2011 (73). This makes the expenses for office space rentals this far

$$€\ 440\frac{m^\wedge 2}{year} \times\ 200\ m^\wedge 2 = €\ 88,000$$

6.4.2.5 Taxes and professional fees

The cost needed for doing business for Persson and Mojang are legal costs in form of payroll tax on salaries. In Sweden this tax for 2011 is almost 37%, including insurances and pensions (74). This estimation is highly inaccurate since Mojang wasn't started until the fall of 2010, but Persson had to pay taxes on the money made from the start of the game as well. In addition this estimation is based on estimated numbers, but I have still chosen to add it in order to get a number on the expense.

$$€\ 440,000\ \times 37\%\ \approx €\ 165,000$$

These are taxes combined with the salary expenses. Mojang and Persson also have to pay a corporate income tax which I will come back to.

6.4.2.6 Miscellaneous costs

In addition to the costs mentioned Persson and Mojang has spent some money renovating the new office spaces and buying new computers and office supplies. There are also costs on legal expenses connected to starting a company, internet connection to the office, dinners and other social events for the team. In order to cover this, and many other expenses I have overlooked, I have set these miscellaneous costs to € 100,000.

6.4.2.7 Cost structure summary

Although I have made many estimations and assumptions in order to calculate the costs and probably missed and overlooked some areas and included expenses the numbers found shows the big picture of Minecrafts costs and gives a picture of the economy of the game. The summary of the costs is found in table 6.

Minecraft cost summary			

Account	Description	Sum	Percentage of total
Storage	Storage costs for account data and game information	€ 46 000	1,4 %
Bandwidth	Transfer costs to and from Amazon servers	€ 900 000	27,4 %
Transaction	Transaction costs to PayPal for handling money transfer connected with purchases	€ 1 580 000	48,0 %
Salary	Employee salary costs through the development	€ 410 000	12,5 %
Office rental	Costs for office space rental	€ 88 000	2,7 %
Taxes and professional fees	Payroll tax and insurance fees	€ 165 000	5,0 %
Miscellaneous	Micellaneous expenses and costs overlooked	€ 100 000	3,0 %
Total costs		€ 3 289 000	100 %

Table 6: Minecraft cost summary

6.5 Actors

I have identified a set of important actors involved in Minecrafts business model.

Markus Persson – the mind and creative source behind the game. He is also becoming a name within the gaming industry and thus being an important part of Minecrafts credibility and marketing through media.

Mojang – the company built up around Minecraft is important in order to handle the growth of the game and the increasing workload coming from an increasing user base and use of the game.

Users – the users of the game are essential to Minecraft through feedback and through word-of-mouth marketing.

Media – the media's coverage of the game and game related stories are important for reaching new customers and promoting the game.

ISPs – internet service providers are important in order to have sufficient bandwidth needed to provide the game and related services.

Transaction companies – partners helping them provide payment options for the game enabling them to get paid for the game in secure ways.

Retail partners – helping them reach customers with merchandise.

7 Minecraft analysis

The sales numbers shown in the case study of Minecraft underlines the great success of the game. Being developed the way it has, it is extraordinary to outsell productions by big game developing studios backed by huge publishers with significant marketing budgets and solid networks. For that reason I want to try to explain how Persson was able to achieve this success and how value was created through the game and the rising communities around it. It has been stated by Persson that it was a combination of skill and luck, and even though the luck part may have been significant there is no doubt that he made some smart moves when starting with Minecraft and through the development of the game.
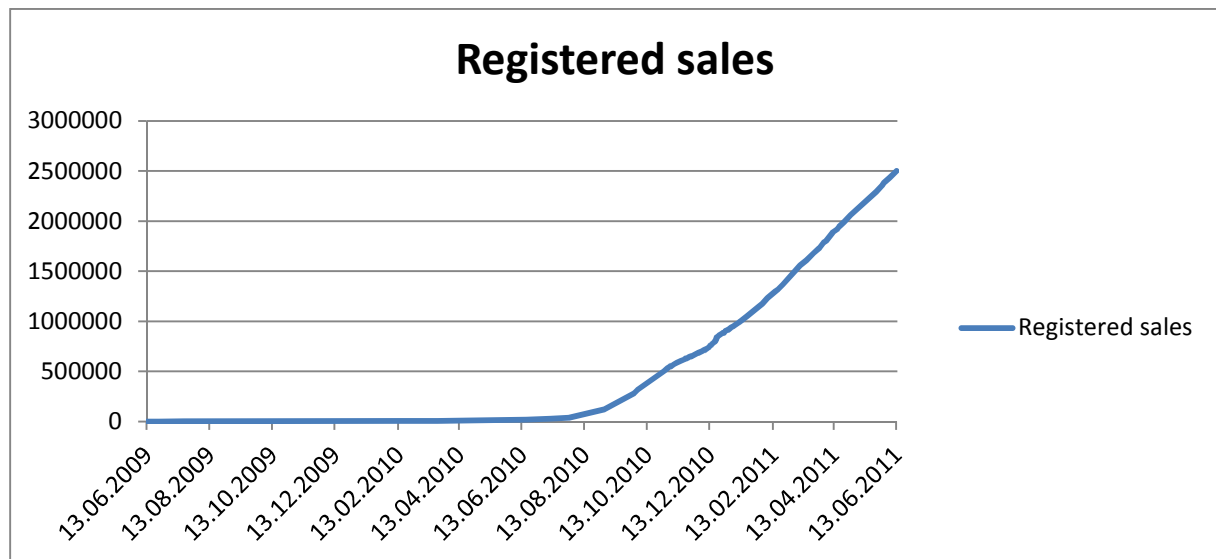
Figure 9: Minecraft registered sales

7.1 Minecrafts strategy

In the beginning Persson wanted to develop a game he liked himself, but also create something he could share with the indie-game communities he was a part of and eventually something he could live on. Already before introducing the option to pay for the game he had shared it on forums, recruiting friends and likeminded developers and gamers and gotten some notice from indie gaming sites like indiegames.com (75) (76). Through the developer part of the forums on TIGSource Persson (Notch) got feedback and advice from

the very beginning of the game utilizing other developers and game enthusiasts while developing Minecraft (77). A small community formed quickly around the game providing rapid feedback on all aspects of the game. At this point the focus was getting a playable, fun game up and running and as for that reason the game was free for anyone willing to play it. By making it free and open he could attract some users and get help on testing and bug finding. Even if it is not directly defined as peer-production Persson utilized resources located in different places with different interests for participating and contributing, and he utilized the power of free in order to do it. As explained in section 3.1 this is often vital for such independent game to attract users and build a user base.

Despite having the game free from the start Persson had planned on getting paid to some extent for the game he was developing. The plan was a retail model basing itself on a pre-sale variant with differentiated pricing throughout the development (54). He followed this plan as shown in the case study while keeping a free version of the game available at the same time. By choosing this model Persson could finance his development while attracting new customers to try out the game and become a part of the growing community.

7.2 Results

The case study shows that the results of Minecrafts strategy are good and the revenue is through the roof. The costs have also been kept low making the profit margin of the game large. As shown in the in the case study Persson and Mojang have made approximately € 32,1 million from sales of the game alone with costs less than € 3,3 million, making the results before taxes an estimated € 28,8 million. With these estimations Minecraft has an operating margin

$$\frac{€\ 28{,}8\ million}{€\ 32{,}1\ million} \times 100\% \ \approx 90\%$$

of 89% which shows that they are in solid financial situation before taxes and well prepared for paying fixed costs.

With a current corporate tax rate in Sweden at 26,3% their tax costs can be estimated [http://www.investsweden.se/Global/Global/Downloads/Fact_Sheets/Corporate-taxes-in-Sweden.pdf].

$$€28,500,000 \ x \ 26,3\% \ \approx € \ 7,500,000$$

With tax costs of € 7,5 million their net profit is approximately € 21,2 million, which can only be seen as incredible. The profit margin can then be calculated to see how Minecraft have succeeded with their pricing strategy and how well they control costs.

$$\frac{€ \ 21,2 \ million}{€ \ 32,1 \ million} \times 100\% \ \approx 66\%$$

With a profit margin of 66% Minecraft has an estimated profit of almost € 10 on every sale of the game with the estimated costs per now. The numbers shows that the prices are high enough in order to cover all costs and leave a considerable profit for Persson and Mojang. It can although be assumed that many of the customers would be able and happy to pay more than € 10 or € 15 and thus increasing the profits, but the risk of losing many of the other customers would then be larger which again could have been or be damaging for the games success. Introducing differentiated pricing in addition to the increasing prices already used would also have led to some work for Persson and taken away focus from other important areas of development. On that background I mean Minecrafts pricing strategy has been precise and successful. I also believe the final price announced to be € 20 is reasonable in order to continue the sales of the game considering development costs will drop at the point of release.

Minecrafts total economy				
Revenue	€	32 142 500		
Operating costs	€	3 289 000	**Operating margin**	
Operating income	€	28 853 500		89 %
Corporate income tax cost	€	7 588 471	**Profit margin**	
Net income	€	21 265 030		66 %

<div align="center">Table 7: Minecrafts total economy</div>

Since I don't know how the cost development has been over time it is hard to say how the sale development will affect the profit, but there are some indications based on the nature of the cost accounts. If the sale growth continues or rises their costs will rise as well with increased storage and bandwidth costs. In addition the need for support and support will increase in order to handle the growing user community, but their profit would still be rising.

Despite the success the sales will drop eventually even if it is in a month or two years from now. Based on the numbers Mojangs monthly average expenses as of now can be estimated based on the numbers shown in section 6.4.2.

Storage costs: $5,500 x 0,70 = € 3,850

Bandwidth costs: € 900,000 / 12 months = € 75,000

Salary costs: € 70,000 / 12 months x 9 employees = € 52,500

Office rental costs: € 88,000 / 12 months ≈ € 7,300

Taxes and professional fees: € 165,000 / 12 months = € 13,750

Miscellaneous costs: € 100,000 / 12 months ≈ € 8,300

Making their total average monthly costs approximately € 160,000. With a sales price of € 14,95 and the lowest transaction fee of 1,9% + € 0,35 their revenue from each game would be € 14,30 per game. In order to keep having a positive operating income they need to sell approximately 11,200 games.

$$€ 160,000/€ 14,30 \; per \; game \approx 11,200 \; games$$

That amount of games is not far above what Minecraft on average has been selling daily since the release of beta. It is then likely to expect the profits of the game to keep rising up to the release of the finished game and for a while after that, promising a bright future for Mojang.

7.2.1 Best case scenario

Although I chose to underestimate the revenue and overestimate the costs I have tried to keep close to what I believe is most accurate and close to what Minecrafts economy is in reality. Despite this it's just an estimation based on limited data and assumptions made based on common business expenses and information from and about the game, and the actual numbers may differ from mine.

They sales numbers are quite clear and accurate as they are based on data released by Minecraft, but there are uncertainties regarding the transition from alpha to beta. As mentioned Persson stated to have sold approximately 800, 000 copies of the game in alpha phase, but the released numbers pointed towards a slightly higher amount before the price increase. The uncertainty makes it fair to assume that the number of beta sales is a as 800,000, making Minecrafts total revenue higher

$$800,000 \text{ copies } \times 9{,}95 \text{ €/copy} = € \, 7{,}960{,}000$$

$$(2{,}434{,}327 \text{ copies} - 800{,}000 \text{ copies}) \times 14{,}95 \frac{\text{euros}}{\text{copy}} \approx €24{,}430{,}000$$

making their total revenue approximately € 32,4 million.

When it comes to costs their biggest expense would still be the transition costs which in addition would be larger due to scaling with revenue at a flat fee based on a percentage of the transferred amount. But as mentioned in section 6.4.2 the fees vary depending on the country where the payment is initiated. In the best case scenario all payments have been transferred with the lowest possible fee. The transition costs would then be

$$(€\ 9{,}95\ \times 1{,}9\ \%) + €\ 0{,}35\ \approx €\ 0{,}54$$

$$(€\ 14{,}95\ \times 1{,}9\ \%) + €\ 0{,}35\ \approx €\ 0{,}65$$

$$800{,}000\ copies\ \times €\ 0{,}54 \approx €\ 432{,}000$$

$$(2{,}434{,}327 - 800{,}000)\ copies\ \times €\ 0{,}65 \approx €\ 1{,}060{,}000$$

The total transaction costs would then be just short of € 1,5 million.

It can also be argued that the office rental space costs could be lower with both a smaller office and in a less expensive area, perhaps as low as € 300 per m² for a 100 m^2 office making their rental costs

$$€\ 300\ \frac{m\textasciicircum 2}{year} \times\ 100\ m\textasciicircum 2 = €\ 30{,}000.$$

Further their salary costs can also be substantially lower. I assume it is fair to assume an average yearly salary of € 50,000, making Mojangs salary costs lower

$$\frac{€\ 50{,}000}{12\ months} \times 70\ months \approx €\ 290{,}000$$

Reducing the salary will also reduce the professional fees.

$$€\ 290{,}000\ \times 37\% \approx €\ 110{,}000$$

The biggest reduction in costs is though connected to the hosting and transferring of data and account information. A low estimate would be an average of 5 MB of data being transferred per game started and 1,500,000 games per day in total.

$$\frac{1,500,000 \; gamesessions \; \times 5 \frac{MB}{game}}{1024 MB/GB} \times 365 \; days \times \$0,08 \; /GB \times 0,70 \; \approx \; €\,150,000$$

for outgoing data and

$$\frac{1,500,000 \; gamesessions \; \times 5 \frac{MB}{game}}{1024 MB/GB} \times 365 \; days \times \$0,10 \; /GB \times 0,70 \; \approx \; €\,190,000$$

for ingoing data, totaling the bandwidth costs to € 340,000. Assuming each user account does not contain more than 1 MB on average the storage costs come to

$$\frac{9,000,000 \; users \; \times 1 \; Mb}{1024 \; MB/GB} \approx 9,000 \; GB$$

$$\$1,140 \; \times 12 \; months \; x \; 0,70 \approx \; €\,10,000$$

based on the calculations using Amazons S3 price calculator described in section 6.4.2.1. (64).

Lastly I add miscellaneous costs at € 20,000 in order to account for some extra expenses.

Minecraft best case scenario cost summary

Account	Description	Sum	Percentage of total
Storage	Storage costs for account data and game information	€ 10 000	0,4 %
Bandwidth	Transfer costs to and from Amazon servers	€ 340 000	14,8 %
Transaction	Transaction costs to PayPal for handling money transfer connected with purchases	€ 1 492 000	65,1 %
Salary	Employee salary costs through the development	€ 290 000	12,7 %
Office rental	Costs for office space rental	€ 30 000	1,3 %
Taxes and professional fees	Payroll tax and insurance fees	€ 110 000	4,8 %
Miscellaneous	Micellaneous expenses and costs overlooked	€ 20 000	0,9 %
Total costs		**€ 2 292 000**	**100 %**

Table 8: Minecraft best case scenario cost summary

As shown in table 8 the total operating costs for Minecraft amounts to € 2,3 million with transaction costs as the dominating expense post as shown in figure 10.

Distribution of costs - best case scenario

- Storage
- Bandwidth
- Transaction
- Salary
- Office rental
- Taxes and professional fees
- Miscellaneous
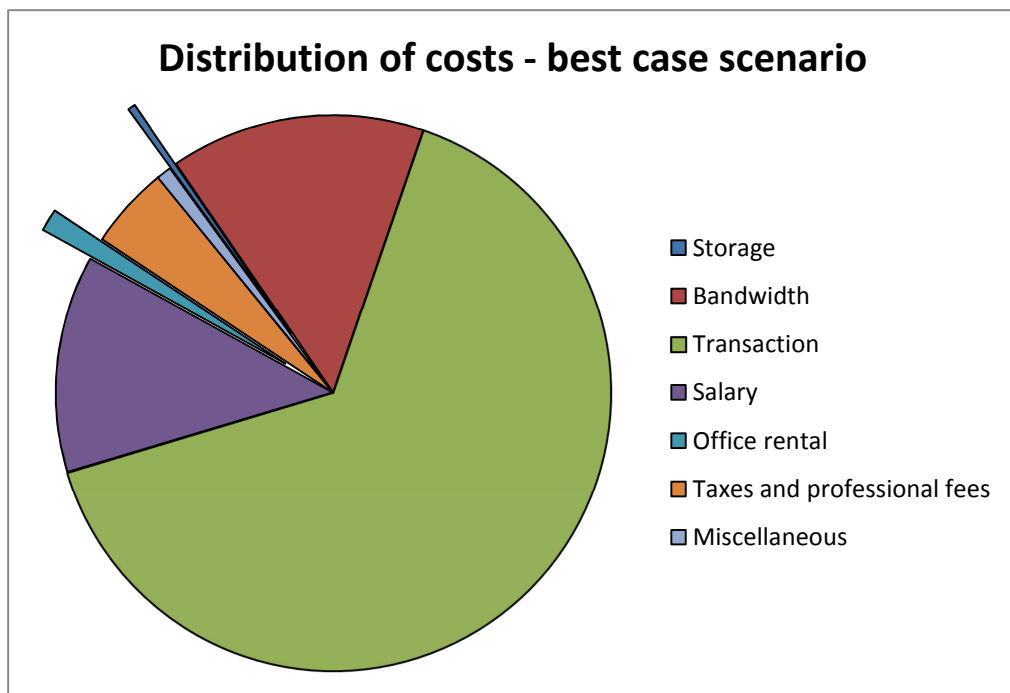
Figure 10: Distribution of costs - best case scenario

In the best case scenario Minecraft has a profit of € 22,6 million and a profit margin as high as 68%. With a margin on that level they make almost € 10,50 per sale.

Minecrafts best case scenario total economy

Revenue	€	32 390 000		
Operating costs	€	2 292 000		**Operating margin**
Operating income	€	30 098 000		93 %
Corporate income tax cost	€	7 915 774		**Profit margin**
Net income	€	22 182 226		68 %

Table 9: Minecrafts best case scenario total economy

7.2.2 Worst case scenario

Like for the best case scenario there are possibilities for scenarios worse than the one I have described, both with lower revenues and higher costs.

For revenues the uncertainty around the price increase can also mean that the actual number of games sold at the alpha stage price level is as high as 875,000.

$$875{,}000 \text{ copies} \times 9{,}95 \text{ €/copy} \approx €\,8{,}700{,}000$$

$$(2{,}434{,}327 \text{ copies} - 875{,}000 \text{ copies}) \times 14{,}95 \frac{\text{euros}}{\text{copy}} \approx €23{,}310{,}000$$

Under this assumption Minecrafts revenue would be as low as approximately € 32 million.

A positive effect of this would be that the transaction costs would be lower, but as mentioned there are uncertainties around the size of the fee depending on where payments originate. Although unlikely the worst case scenario would be that all payments originate outside of EU countries. The fee percentage would then be as high as 2,4%.

$$(€\,9{,}95 \quad \times €\,2{,}4\,\%) + €\,0{,}35 \approx €\,0{,}59$$

$$(€\,14{,}95 \quad \times €\,2{,}4\,\%) + €\,0{,}35 \approx €\,0{,}71$$

$$875{,}000 \; copies \times €\,0{,}59 \approx €\,515{,}000$$

$$(2{,}434{,}327 - 875{,}000) \; copies \times €\,0{,}71 \approx €\,1{,}110{,}000$$

This would give transaction costs just exceeding € 1,6 million.

Assuming they rent quite a larger office space to prepare for future growth in the exclusive business area in Stockholm it would be fair to assume an office on 300 m^2 for € 440 per m^2 per year, making their office space rental cost the following:

$$€\,440\,\frac{m\char`\^2}{year} \times \; 300 \; m\char`\^2 = €\,132{,}000$$

When it comes to the salary the success of the game might lead to generous salaries or bonuses for the employees and Persson himself. Although I still might be underestimating this cost I would be surprised if the average yearly salary in Mojang exceeds € 100,000 based on my experience and information on the Mojang employees. It can also be that the time spent developing the game is higher than what can be assumed based on the available information, so I consider the worst case scenario time cost of the development to be 75 months. With these assumptions the salary costs would come to:

$$\frac{€\ 100,000}{12\ months} \times 75\ months \approx €\ 625,000$$

This would also lead to higher professional fees.

$$€\ 625,000\ \times 37\% \approx €\ 230,000$$

As for the best case scenario the accounst with the biggest uncertainties and possibilities for highest cost variation is the hosting account and the bandwidth account. Although I can't say it with certainty an amount of 15 MB of data transferred on average per game is a high estimate based on my experience. This is supported by the estimations and assumptions made by C.-A. Larsen in Business Model Aspects of the Online Gaming Service Industry regarding data transfer for Blizzards OGS Battle.net (78). It can further be argued that an average of 2,500,000 games are started and played each day. The cost for out-going traffic would then be:

$$\frac{2,500,000\ gamesessions\ \times 15\ \frac{MB}{game}}{1024MB/GB}\ \times 365\ days \times \$0,08\ /GB \times 0,70\ \approx\ €\ 750,000$$

For in-going data the costs would be:

$$\frac{2,500,000 \ gamesessions \ \times 15\frac{MB}{game}}{1024MB/GB} \times 365 \ days \times \$0,10 \ /GB \times 0,70 \ \approx \ €\ 935,000$$

The total bandwidth costs would then be as high as almost € 1,7 million making it the highest expense post for Minecraft.

Assuming the size of each user account to be as big as 10 MB the storing costs would be as following:

$$\frac{9,000,000 \ users \ \times 10 \ Mb}{1024 \ MB/GB} \approx 90,000 \ GB$$

$$\$10,700 \ \times 12 \ months \ x \ 0,70 \approx \ €\ 90,000$$

I chose to set the miscellaneous costs to € 100,000 as well since the overestimates made on the other accounts should cover the variances within those main areas in addition to the sum being an overestimate in the first place in my opinion.

Minecraft worst case scenario cost summary

Account	Description	Sum		Percentage of total
Storage	Storage costs for account data and game information	€	90 000	2,0 %
Bandwidth	Transfer costs to and from Amazon servers	€	1 685 000	37,6 %
Transaction	Transaction costs to PayPal for handling money transfer connected with purchases	€	1 625 000	36,2 %
Salary	Employee salary costs through the development	€	625 000	13,9 %
Office rental	Costs for office space rental	€	132 000	2,9 %
Taxes and professional fees	Payroll tax and insurance fees	€	230 000	5,1 %
Miscellaneous	Micellaneous expenses and costs overlooked	€	100 000	2,2 %
Total costs		€	**4 487 000**	**100 %**

Table 10: Minecraft worst case scenario cost summary

The table 10 shows the distribution of costs in the worst case scenario. In figure 11 the distribution of the cost are shown, showing that the bandwidth costs are dominating along with the transaction cost in this scenario.
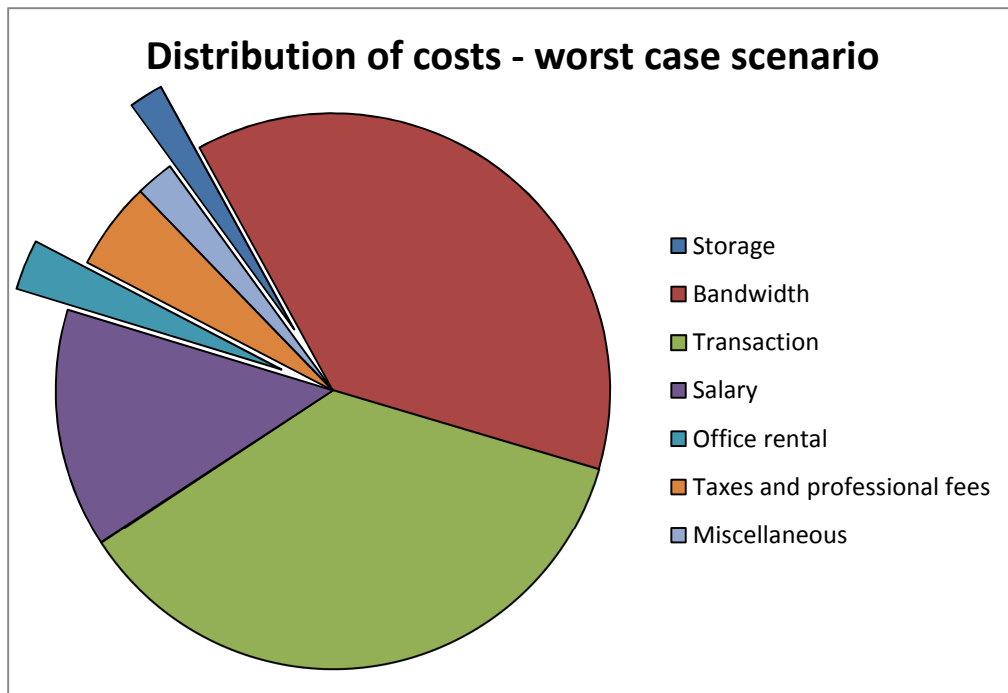
Figure 11: Distribution of costs - worst case scenario

The profit margin is at 63% at the worst case scenario with a profit slightly below € 20,3 million as shown in table 11.

Minecrafts total worst case scenario economy			
Revenue	€	32 010 000	
Operating costs	€	4 487 000	**Operating margin**
Operating income	€	27 523 000	86 %
Corporate income tax cost	€	7 238 549	**Profit margin**
Net income	€	20 284 451	63 %

Table 11: Minecrafts total economy worst case scenario

7.3 Cost control

Aside from the revenue model and pricing the most important factor for the incredible margins are the low costs Minecraft has been able to achieve and maintain. It is essential for indie games and small productions to keep their costs low as there are usually not much funding to obtain and projects like Minecraft are driven by few people using their spare time

to create games. Although keeping costs low is a given for most indie based games, Persson took some smart strategic decisions when starting the development of the game.
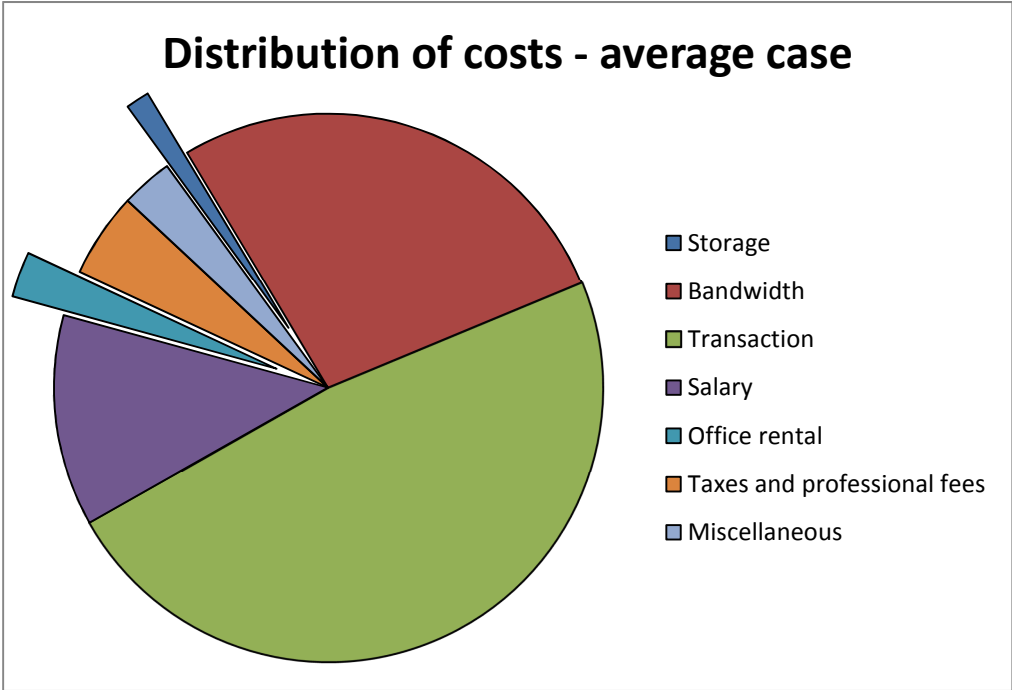
Figure 12:Distribution of costs - average case scenario

Figure 12 shows the percentages of the total costs for each of the accounts of expenses for Mojang. It shows that half their costs up until June 2011 comes from transactions, meaning that their biggest expense is connected to transferring money from customers to Persson and Mojang. And when handling and securing the large amount of money transferred is the main cost it can safely be said that they have succeeded in keeping cost down compared to income. That expense is also necessary and hard to reduce since any external firm or security measure will cost a base fee per transfer, meaning that it will stay on a steady level depending on the sales of the game.

A more interesting thing is that the other expenses has come more or less as a result of the success and will only keep growing even when sales go down. In order to maintain the game for a growing user base Mojang will have to keep their employees and probably hire more to deal with support, something that will increase tax fees and office rentals as well (provided that they hire more people and grow out of their current space). The costs connected to

storage and bandwidth will also increase with an increasing amount of players and game sessions.

7.3.1 Peer-production

As mentioned earlier Persson utilized existing indie game developing communities to promote his game and create interest around his project. The result was a group of people testing his game, giving feedback rapidly and providing ideas and information on solutions and possibilities. Although the game was free for all these users this can be seen as peer-production and Persson reduced his development costs by adding testers and contributors working for free out of their own interests and enthusiasm.

Instead of testing every bit of newly developed material thoroughly he could release it to the users who would try it out in its right environment and report back through the forums. I classify this as lightweight peer-production as the contribution is done somewhat anonymously through forum usernames with a low level of entry to contribute, namely creating a forum account and participating in the community. The fact that Persson, and later Mojang, have total control on implementation, letting many people come with small contributions and utilizing them as they see fit also shows that the contributions are in the form of lightweight peer-production. The contributors help out of own interest and are rewarded by Persson through praise and in some occasions mentions in official blogs and community sites, like when Persson names specific contributors in his blog and link to the contribution (79).
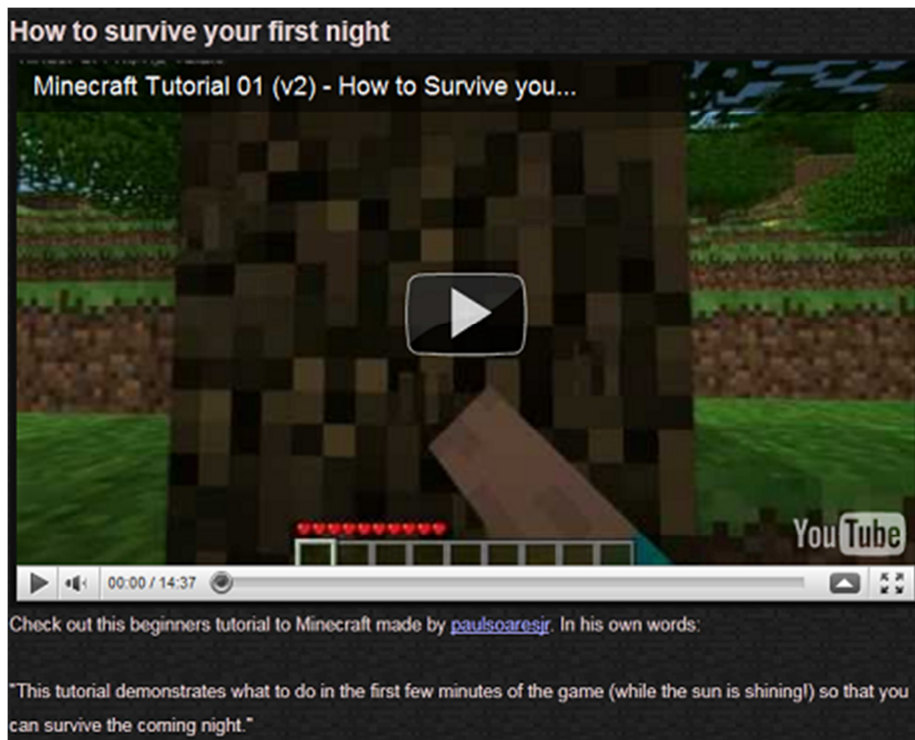
Shown in figure 13 is a tutorial on how to get started in the game made by a Minecraft user. The video, which is embedded from Youtube, is featured in the official help section on Minecraft.net, showing how Persson utilizes contribution and reward the maker by featuring it at the official website and linking to his user account on Youtube.

Another important part of Perssons utilization of user contribution is the community sites which provide information and support as well as market the game towards users. As said in the analysis of the game, most of the official support sites were started by users and are being run and hosted by users. In addition to keeping hosting costs down this also freed up time for Persson to focus on developing from the start. Although he would have had to deal with quite a lot of support since the beginning many questions and ordinary problems have been answered and sold by users of the game through sites like minecraftforum.net and minecraftwiki.net. At this area Persson didn't have that much control on content, but it still is a necessary part of the game. He has started some sites of his own, driven by Mojang, but the quality of the user contributed material was good enough to make his efforts to create community sites needless at some points. An effort to create an official self-made forum for Minecraft actually lead to Persson apologizing to some of the users for not considering their

feelings and appreciating their work with the user made forum (80) (81). While this shows that he didn't want to avoid the hosting costs he stated that he really didn't want to run the forums, thus encouraging and relying on user contribution and labor in order to provide an essential part of the value of the game.

Another factor connected to peer-production is the reasonably low salary costs. The salary costs are basically development cost and the utilization of peer-production is a significant part of keeping these costs low. If Persson and Mojang were to create and establish all the community sites, instructional videos and help threads connected to Minecraft they would have spent a vast amount of hours more than what they have per now.

7.3.2 Technical solutions

Cost reduction is something usually connected with value chains where companies plan their operations in order to minimize costs. Another decision pointing towards Persson having a value chain mindset is the solution around game hosting for multiplayer games. Instead of hosting games on dedicated servers he reduced his costs by providing users with server software and making them host their own games or get hosting through other sources like community and gaming sites. By doing this he kept his investment in the game low to avoid spending money setting up and running game servers. He also utilizes existing web opportunities for hosting sites, securing payments and transferring data. Through using external firms like PayPal and Amazon he can keep the costs low and based on transactions. Instead of having fixed prices Persson and Mojang get stable services which scale with sales and growth of the user base enabling him to keep costs lower than income at these areas.

The competition created by the possibilities of the internet also let him create sites for bug reporting at reasonably low costs through sites like GetSatisfaction, offering custom sites for many areas. The quality of a specialized site like GetSatisfaction lets Mojang provide bug reporting and customer interaction at a low price and low effort as they only have to focus on the interaction with customers without dealing with running and hosting the site. This also reduce their salary costs by not having to spend that much time on it or hiring more people to deal with it.

7.4 Value creation

There are many other great indie games and projects available on the internet and also games similar to Minecraft. Despite this Minecraft has been able to break through as a huge commercial success, winning game awards and selling for millions. It tells me that the idea behind the game must have been great and innovative in order to stand out and grow the way it has. I do not, however, believe that the success is a result of the game itself. The network around the game has been and is the most important thing. The force of network effect and positive feedback is apparent when seeing how the sales explode in the fall of 2010.
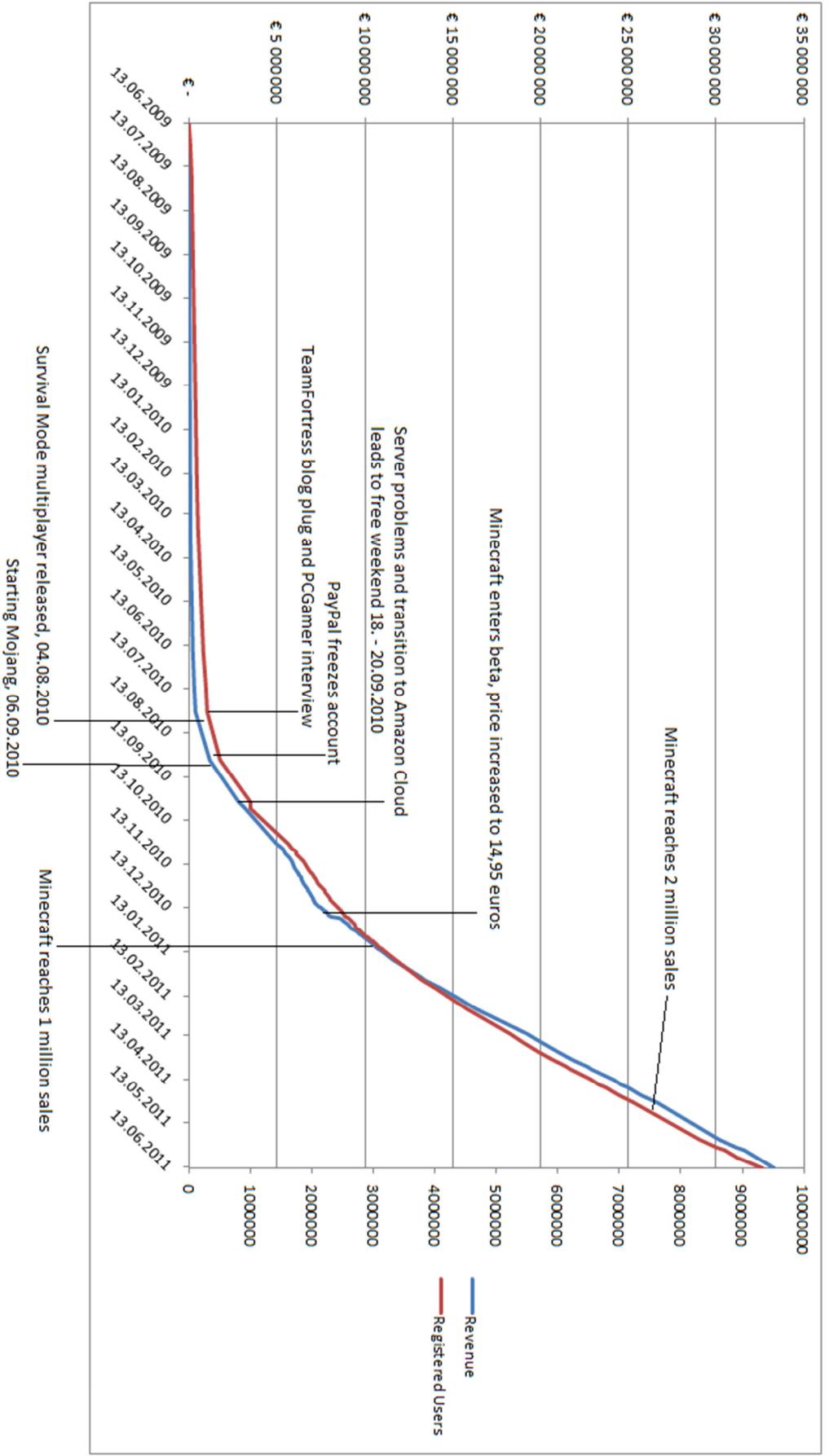
Figure 14: Minecraft user and revenue timeline

Although figure 14 shows that Minecraft had a steadily increasing user base and a growing number of sales from the start it didn't take off for real until the midst of August 2010. During July Persson worked with the survival multiplayer mode and posted about the progress through his blog. In the end of the month he got a positive notice on the TeamFortress blog praising the gaming and telling their users to buy it (82). The day after an interview with Persson in one of the most read gaming magazines in UK and USA, PCGamer, was published where he states that Minecraft with working multiplayer survival mode contains what he had planned for Minecraft and thus being a finished version (83). Though, also stating that he would continue working on it and adding features to it as long as people were buying the game. After these two media promotions Minecraft experienced its first peak in 24-hour sales exceeding 1000 and having over 4000 people register for the game (84).

Although the interviews spurted an increase in sales and interests the main starting point of Minecrafts explosive growth was the release of Survival Mode multiplayer August 4, 2010 (85). Even though the game had multiplayer options for classic creative mode from the start it didn't include the main aspect of the gameplay, namely survival. Interacting with other players as well as the environment has been the most popular mode of the game since the release and it is obvious that it struck an area of interest amongst gamers.

The period following the release is, from my point of view, crucial. As a result of the beta release the game got reviews from several gaming sites and community sites from people already following the game, there amongst the popular site RockPaperShotgun (86). The articles created advertisement for the game promoting it to new people. It is fair to believe that the people trying the game liked the new addition and started telling friends about it and spreading it through word-of-mouth. Using Google Trends the average worldwide traffic for the Minecraft can be seen showing how the traffic has fluctuated through the last year (87).

Figure 15: Google trends graph over Minecrafts interest on the search engine (88)

Although there are some inaccuracies to this service it provides a picture of how the interest around Minecraft developed from the point Survival Mode multiplayer From that point the traffic increases in tact with the user numbers and has been increasing in general ever since, as seen in figure 16. The reason for this is the network effects and positive feedback created by interest use.

7.4.1 Network effect and positive feedback

When the survival mode multiplayer was released it opened for playing the most popular part of the game together with friends thus increasing the incentive to recruit friends to the game. For each friend recruited the value off the game increased for all users belonging to that group or server. The existing multiplayer in classic creative mode did not open for the same kind of interaction and play as the survival mode, so the new release opened for a whole new segment of customers and a new level of value creation.

The customers started using many different distribution channels for recruiting people and sharing creations. There are over a million hits for Minecraft on Youtube, hundreds of community sites and forums and millions of mentions on social sites like Twitter and

Facebook. Examples of such promotions of the game is, is as mentioned, the creation of art work and impressive buildings in Minecraft.
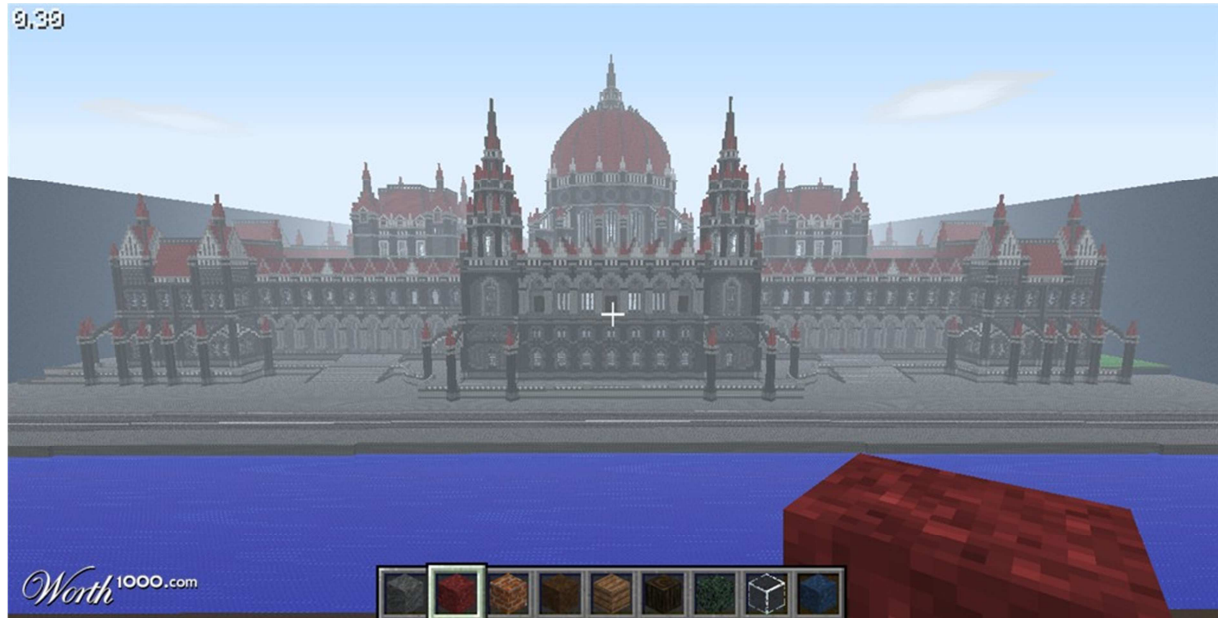
Figure 16: User-made replica of the Hungarian parliament made in Minecraft (89)

Figure 16 shows an in-game version of the Hungarian parliament created by a user placing one block at the time. These types of creations often create positive feedback as it inspires others to create things as well. It can also make people interested in the game itself because it is an impressive achievement. The sandbox element of the game lets people show of skills and interests and rewards them through interest and praise from other users. In order to get praise and acknowledgement they are also interested in showing it to as many people as possible, leading them to post picture like this on many different forums and channels again creating positive feedback.

Another important part of the positive feedback connected to Minecraft comes from the popularity it has been able to create. People are interested in what other people are interested in, and by being popular a lot of attention is created. People catch on to trends and likes things because they are popular thus making the ball roll so to speak.

Even though much of these effects are user made and driven they come as a result of Perssons decisions. The openness around the game and the utilization of existing communities enabled him to create a small, but enthusiastic network around the game. The effects were the same in the start, although at a much smaller scale, something the steady increase from the start shows. Without adding people to the network and creating a community providing information, support and testing it would have been much harder to achieve the explosive growth.

7.4.2 Free

Persson has taken advantage of the power of free as mentioned earlier. Since the beginning he has kept a free version of the game available for anyone willing to try and although it hasn't received that much attention in terms of development compared to the survival mode, it creates value for Minecraft. Allowing people to play the classic creative mode for free might lose him some revenue from people preferring that part of the game, but if those users introduce the game to two friends who end up buying the survival mode and adding to the value network. This idea is underbuilt by, and is similar to, Perssons views on piracy. If a user pirates the game and enjoys it he might talk to friends about it and introduce them to the game. By creating additional value for paying customers instead of fighting a losing battle with pirates he can recruit such users in to full customers. Services not available to pirates:

"*..why fight the biggest revolution in information flow since the printing press when you could easily work with it by adding services that actually add some value beyond the free act of making a digital copy?*" (90).

He wants to work with the freedom in the networked information economy created by the development in the internet instead of against it, utilizing the power of free. This might also be the base for his openness and interest in keeping a free version available. It also shows that he understands how to reach customers and add value to the Minecraft network. As decribed in section 4.1 World of Goo had a similar experience when not focusing on piracy and disregarding DRM which points toward it being an important factor. I believe that the attitude towards piracy by both Persson and Carmel & Gabler separates them from the

mayor publishers and game developers and puts them on the side of the gamers. The psychological effect might be that sympathy is created and the willingness to support and pay for the games is increased. The choice may lead to a great deal of piracy and loss of potential revenue, but as explained in section 3.1 this form of free is usually forced upon creators of digital products anyhow. By separating themselves from the hard fight digital distributors have fought against piracy they can actually achieve positive effects from one of the troubles concerning digital products

Another interesting point, when it comes to creating value and acquiring customers, is shown in figure 14. From the midst of August and through September Minecraft experienced several instances of server problems caused by the increasing traffic. The servers buckled under the pressure and it resulted in a breakdown and transfer to new hosting on the Amazon Cloud the weekend 18. – 20. September 2010 (91). Since payments were disabled he announced a free weekend letting people try the game for free the entire weekend. As shown figure 14 this resulted in an increase in sales in the following period. By announcing it as a free weekend through many channels he attracted new customers to the game. The word-of-mouth effect was also significant because of the timing. At that time Minecraft was in a growth period with many new users being added to the game in a short period of time. The free weekend allowed them to get a taste of the full game and all it had to offer, there amongst level saving. At the end of the weekend the saves would be gone along with the access, creating a form of lock in encouraging them to purchase the game. In addition the new users would possibly be more eager on marketing the game to friends because they were in the enthusiastic discovering phase of the game. This is similar to the effects World of Goo had with their birthday promotion letting people pay what they wanted for the game. Through such experiments they gained more customers and actually made money on goodwill and peoples willingness to pay for products they like.

Although this occasion was somewhat luckily pushed out by a server breakdown and transfer, Persson has utilized free to add to his network in important phases. The Minecraft traffic graph shown in figure 15 shows the burst in Minecraft traffic at the time of the free weekend, displaying how it affected the interest around the game - a positive feedback effect caused by the marketing done by the network, leading to an increasing network value.

7.5 Summary and suggestions for possible changes

In this section I summarize the economy of the game and the use of effects and revenue models underlining Minecrafts success. I also describe some challenges for the game and suggest some changes and solutions based on my results and information on the game.

7.5.1 Economy

In order to account for the inaccuracies in my model I set up a best and a worst case scenario. By looking in to different possibilities based on the data available I feel I can place Minecrafts revenues and costs within a certain range.

The revenue of the game only depends on the price increased introduced in the transition from alpha to beta. As shown in figure 17 the revenue lies within the range of € 32,4 million and € 32 million.
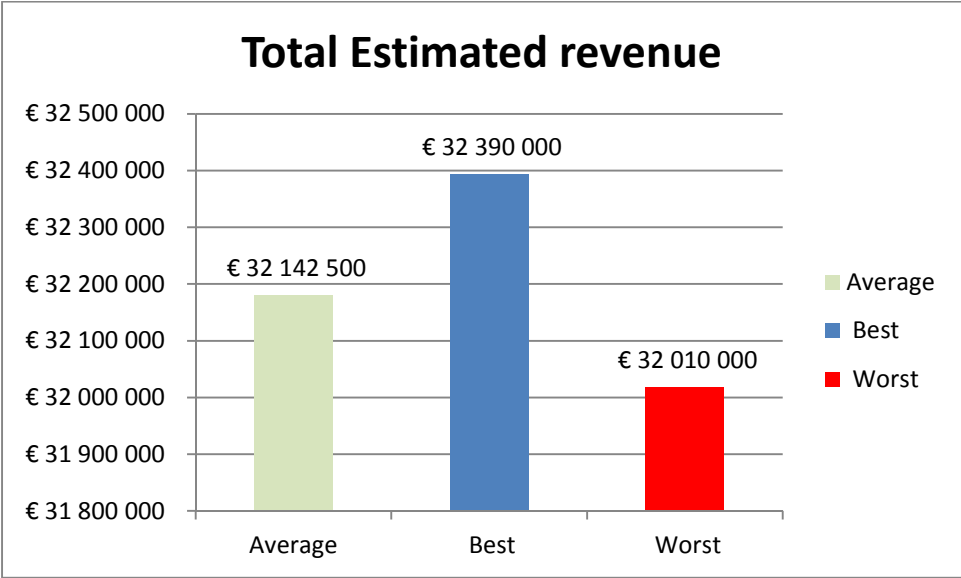
Figure 17: Total estimated revenue comparison chart

Assuming Minecraft doesn't post false or inflated sales numbers through their site the revenue range is fairly accurate.

There are greater uncertainties connected to the cost accounts of Minecraft, so despite making estimations I deem reasonable there might be factors overlooked affecting the costs

in significant ways. It is though likely that the costs lie within the range presented in table 12 and figure 17.

Minecraft case scenario cost summary

Account	Description	Average scenario Sum	Best scenario Sum	Worst scenario Sum
Storage	Storage costs for account data and game information	€ 46 000	€ 10 000	€ 90 000
Bandwidth	Transfer costs to and from Amazon servers	€ 900 000	€ 340 000	€ 1 685 000
Transaction	Transaction costs to PayPal for handling money transfer connected with purchases	€ 1 580 000	€ 1 492 000	€ 1 625 000
Salary	Employee salary costs through the development	€ 410 000	€ 290 000	€ 625 000
Office rental	Costs for office space rental	€ 88 000	€ 30 000	€ 132 000
Taxes and professional fees	Payroll tax and insurance fees	€ 165 000	€ 110 000	€ 230 000
Miscellaneous	Micellaneous expenses and costs overlooked	€ 100 000	€ 20 000	€ 100 000
Total costs		€ 3 289 000	€ 2 292 000	€ 4 487 000

Table 12: Minecraft case scenario cost summary

With these estimation the total costs of Minecraft likely lies between € 4,5 million and € 2,3 million which quite a significant difference. The reason for this is the uncertainties around bandwidth especially. The large number of users makes small variations in average transfer size and account size influence the bandwidth cost significantly. The difference between 5 MB and 15 MB of data transferred in average per game started amounts to over €1,3 million. As shown in figure 18 the bandwidth is the decisive cost account and the other big expense post, transaction costs, remains somewhat constant.
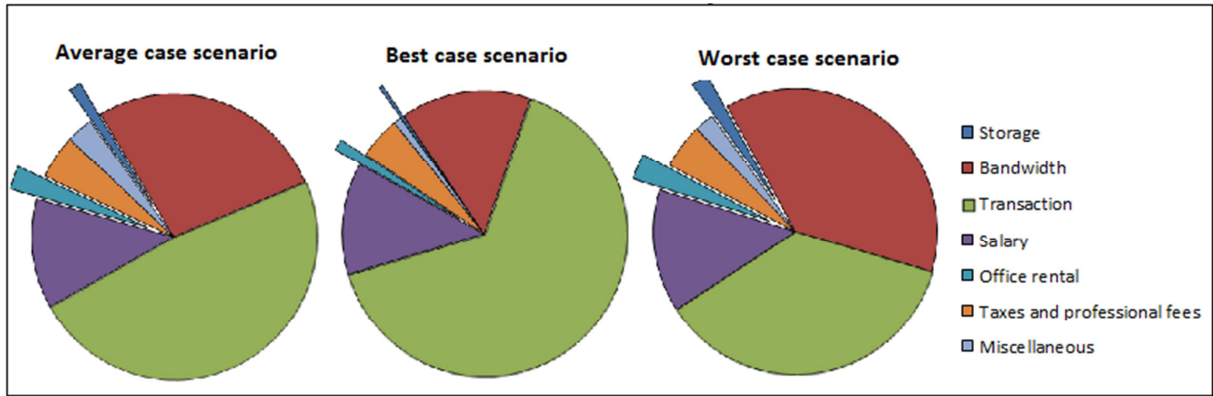
Figure 18: Cost distribution comparison diagram

The other cost accounts are relatively constant compared to one another in the case estimations and any combination of cost variation would most likely lie within the range. The percentage of total costs could however be different with different types of combinations.

The average case I have modeled is slightly closer to the best case scenario as shown in figure 19.
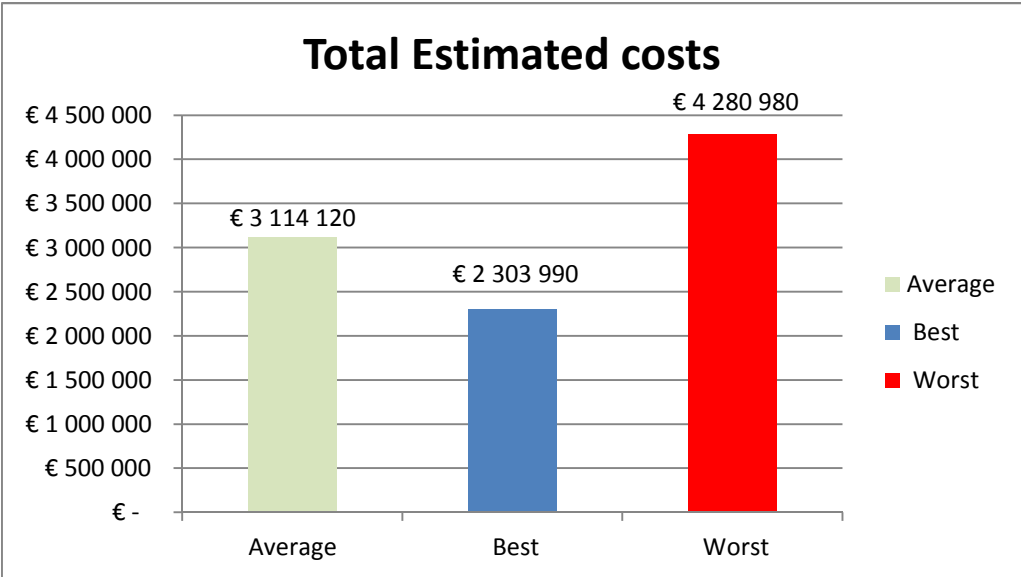
Figure 19: Total estimated costs comparison chart

The reason for this is that the worst case scenario is high compared the costs I believe to be accurate based on the information I have acquired on the game.

To assess the profit of the profit development can be found using the profit margin found in each of the cases. The average profit margin is 66% , 68% for the best case scenario and 63% for the worst case scenario. The costs would not have been distributed evenly throughout the history of the game, but figure 20 shows how the development of profit for Mojang will develop. The costs were probably larger than the revenue from the start of the game and perhaps as long as to August 2010 if salary for Persson and office rental is considered. From that point on the revenue outgrew the costs and the profits rose like shown below.
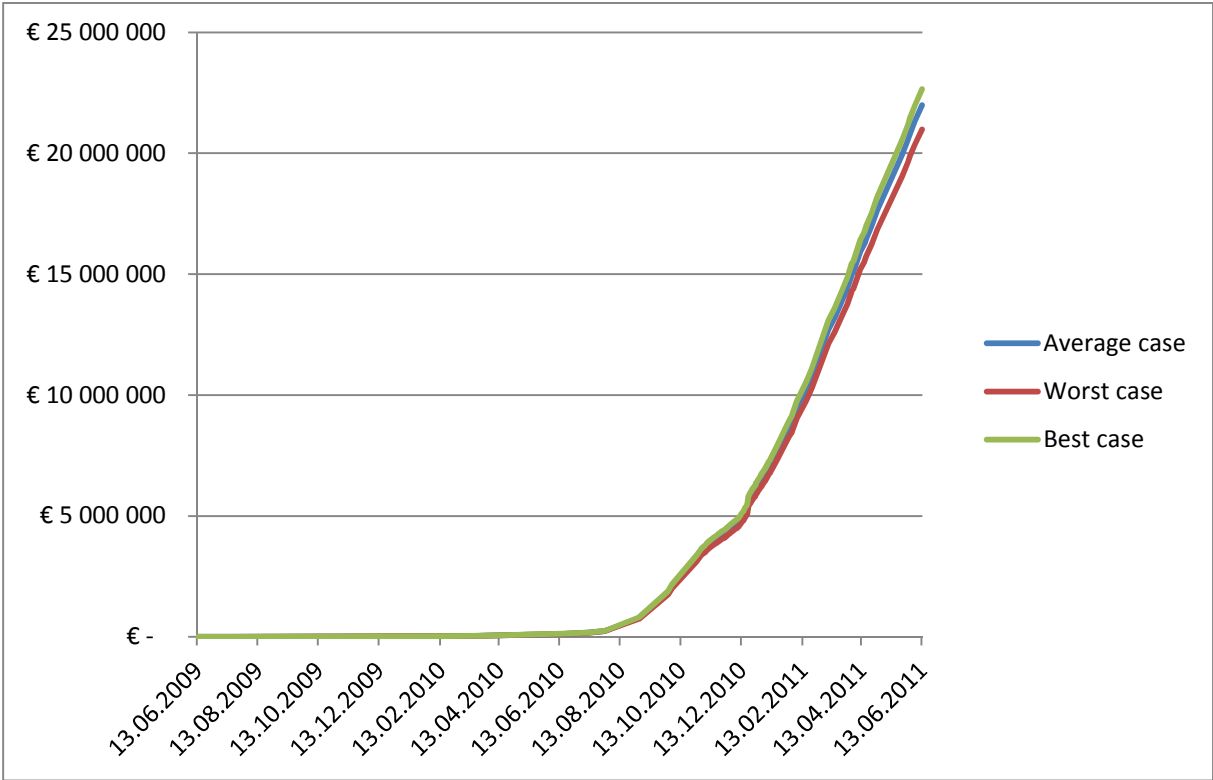
Figure 20: Profit development graph

In order to get a clearer view figure 21 shows the development in profit with the different profit margins during 2011.
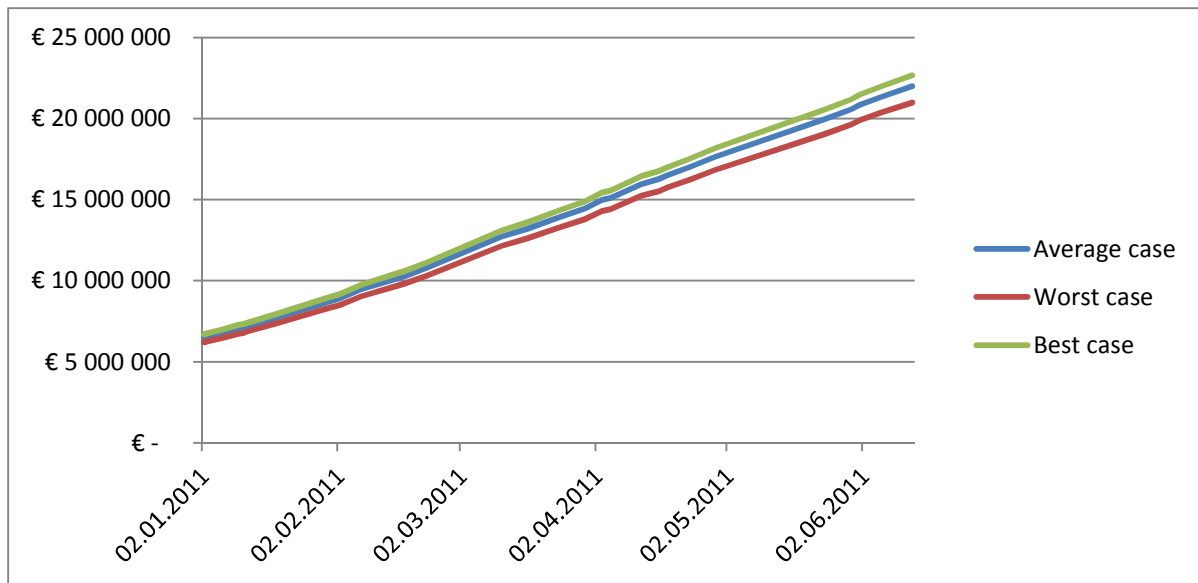
Figure 21:Minecraft profit growth comparison

The real profit of Mojang lies between the best case and worst case scenario profit lines shown in figure 21 showing that Minecraft has had a steady growing profit up to June 2011. The monthly costs of running Minecraft compared to the current popularity and sales of the game shows that the profit of the game will keep rising for yet some time giving Minecraft the possibility to grow.

7.5.2 Effects

The most important factor for the success of Minecraft is the utilization of a free model in order to attract customers. As shown in section 3.1 and with World of Goo in section 4.1 this has proven to be important for other actors as well. If he had relied on a pricing model on both the classic creative mode and the survival mode from the beginning I doubt that he would have been able to attract people and create a community around the game. By being open with his intentions, ideas and creations he could utilize peer-production around the game and keep his costs down.

In addition to utilizing free work power he could market his game through the network. By making smart choices with free weekends and close connections to his users he played on the network effect and positive feedback, increasing the value of the game.

7.5.3 Future suggestions

In a short term perspective I believe it's important for Mojang and Persson to maintain a good relationship with their user base. By keeping their customers happy they can avoid having to hire more employees to handle support and complains and keep utilizing the peer-produced support through the community. It will also help them market the game up to the release of the finished games with users urging friends to buy the game before the price is increased. It will also be smart to introduce the modding-licenses to create more content to the game to keep it exiting for the users. In other words it's important for Mojang to play into the network effect and keep adding value to the game and its network.

In a long term perspective there are some other important factors. As mentioned the sales will eventually drop when the popularity of the game falls. By selling the game retail for a fixed price he will eventually saturate the market and run out of potential customers. Although it can be said that Persson and Mojang have made a fortune by that time, or now for that matter, they will start losing money on the game. While the sales will drop people will still be playing the game which means that Mojang maintains its bandwidth and storing costs if they want to keep their reputation. They will also need to provide support to their gamers which requires employees and office space in addition to miscellaneous costs for running and managing a company. The only cost account that will disappear is the transaction costs while the game loses its main source of revenue.

As I see it, it would be hard for Mojang and Minecraft to reduce the costs significantly. They are already a small team with quite reasonable salaries with normal office expenses which would be hard to cut. The most logical and efficient account to cut and the biggest cost account by far will be the bandwidth account. Finding other ways to host and transfer data would not be that efficient as the market is pretty close to marginal costs already, in addition third party hosters like Amazon let Mojang pay for the amount transferred and stores which would lower costs automatically with decreasing users as opposed to investing in servers and lines to host the data themselves or paying a fixed price. For these reasons Minecrafts best cost reducing option is to find ways to reduce the amount of data transferred through technical solution and efficient coding like avoid sending any unnecessary information.

Although there are some potential savings in reducing the needed bandwidth I doubt it will be enough to withstand lack of sales over time. For that reason I think that Mojangs main longterm focus should be to introduce new revenue models to Minecraft. The sites open for web-advertising which would create some revenue due to the large amount of users in the Minecraft network. The sandbox concept of the game also opens for in-game advertising. The risk of advertising models is that it damages Minecrafts reputation and can be negative for customer relations. Despite this advertising revenues can cover the costs of keeping the game running and with sales going down Minecraft may be less eager to keep customers playing the game and more inclined to push them towards newer games they release making it a feasible model.

Another potential way to go is to utilize peer-production through the mentioned mod-license. User created mods can be sold as add-ons or expansions. In a similar way the game can be made available on other platforms like smart phones and consoles in order to reach new markets, which perhaps is the most likely way to go after the finished game is released. Through that option he can sell out or just transfer much of his running costs to bigger publishers.

One of these possibilities is likely to be seen from Mojang as soon as the sales start dropping.

8   Conclusion

The motivation behind this thesis was to look into the economy of small and independent games and how the development and possibilities in the market has influenced these games. In order to answer this question I performed an in-depth and detailed analysis of the independent game Minecraft using Osterwalder's business model ontology framework. Based on my findings I modeled the games economy to assess its value and status as of June 2011.

Through the analysis I found Minecraft to be a highly successful and profitable game based on my calculations. Although the calculations are based on estimations and assumptions the openness around the game provided information supporting my estimations leading me to believe that my model paints a good picture of the reality of the game. In order to account for inaccuracies I modeled a best and a worst case scenario for the game for both revenues and the cost accounts. The calculations placed Minecrafts revenues between € 32 million and € 32,4 million and the total costs between € 2,3 million and € 4,5 million. After taxes the game is left with a profit between € 20,3 million and € 22,2 million, and with an average case profit of € 21,2 million and a 66% profit margin there is no doubt about the games success.

In order to achieve this success Minecraft utilized a smart business model combining a free model with a retail sale model. The creator, Markus Persson, did this by taking a reduced price for the main mode of the game while keeping a free mode available for anyone willing to play the game. Through the retail sales he funded his development and kept his costs low by people expecting less from an unfinished game, and through the free model he gained attention and attracted people to the game. As a value network this is essential to add value to the network and through the emerging community he found free labor through peer-production with people creating community sites and support sites for the game. Through the network effect and positive feedback loops Minecraft exploded after a popular game patch release.

The development of technology and the internet opens for many developers and the competition is hard, making it hard for indie games to make a profit or even staying alive. Although it would be unlikely for most independent and small games, if any at all, to follow

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the success of Minecraft the study points to some traits I expect to be vital for small game developers. The utilization of a free model was shown to be essential which is supported by the experience World of Goo had with piracy. Free models will be forced upon game developers if not utilized freely. The future for independent developers lies in value networks and network effects and positive feedback obtained through free or word-of-mouth marketing through free distribution channels like Youtube, Facebook and community sites and forums.

Another thing the analysis of Minecraft showed was the need for combining revenue models in a long term perspective. The technology opens for transition to new markets like smartphones and consoles for small development teams, something I expect will happen with Minecraft in a long-term perspective.

9 Future work

Most small games and indie games have a tight economy and struggles to survive in the competition and these games have not been studied in detail in this thesis. Finding, studying and analyzing such games would give further insight into the industry. Instead of looking at the success stories some of the struggling or failed games should be studied in order to see what choices and circumstances lead to failure. How indie games are divided between the platforms would also give valuable information on the small games industry.

As for Minecraft this thesis only presents the state of the game as of June 2011 without looking into the details of the development of the cost accounts and the revenues. Studying how the costs have developed would be useful in order to get a clearer picture of the real economy of the game and create a basis for describing future scenarios more accurately. The cost accounts can be assessed in relation to different scenarios on the future of the game and the models can be made for different expectations on sales development and related costs.

Another interesting task would be do identify independent games and perform tests to see if free distribution channels can be utilized more actively to influence sales and attention from customers. The channels could then be broken down and compared in order to see which channels are most influential or effective. The vital traits for indie games pointed out in this thesis should be tested through several other case studies to evaluate different settings and concepts up against each other.

Lastly, trying to create a game based on peer-production through a community site would be interesting in order to assess the viability of pure peer-produced games and find out if it can be done without having a hierarchical structure.

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Appendices

This chapter provides a worksheet of important findings concerning Minecrafts history and the dates connected to the information. It also includes an economic structure model used for calculating Minecrafts revenues and costs for average, best and worst case scenarios. Appendix A is the timeline worksheet. Appendix B1 shows the values used and found for each case and appendix B2 the corresponding formulas.

Appendix A

Dato	Registerte brukere	Kjøpere av spillet	Nye brukere registrert siste 24 t	Nye kjøpere siste 24 t	Kommentar
09.05.2009					
17.05.2009	0	0	0	0	
19.05.2009					Minecraft.net introduced
24.05.2009					Official forum mojang.com/forum
27.05.2009					First review, zolyx.co.uk/minecraft
08.06.2009					Multiplayer classic release
09.06.2009	4200	0			
13.06.2009		0			Pre-orders open at 9,95€
16.06.2009					Minecraftforum.com started by user, Citricsquid
25.06.2009	15185	587			
19.07.2009		990			
04.08.2009					Survival Mode singel player released
25.08.2009					tigsource.com front page feature
01.09.2009					Survival Mode test released, paying customer exclusive
24.10.2009					Survival Mode free testing
20.11.2009					Asks for helps on graphics, paid gig
11.12.2009					X-mas offer released
01.01.2010					X-mas offer results
03.01.2010					Mentions in free games of the year - Gamasutra
11.01.2010					Supporting "word-of-mouth" as long as the game isn't distributed
13.01.2010	100000				
21.01.2010					The possibility to buy they game as a gift to friends introduced after user demand
25.01.2010					Introduced flash-adds to webage.
27.01.2010					Changed adds to text only because of performance offers, also stating that "they won't make me rich" in relation to the monetary aspect
28.01.2010					Adds removed claiming it's only really good for the advertisers.
30.01.2010					Suggestion to start a community site which is to be paid for by Persson as long as he doesn't have to run it

31.01.2010					Thanking the runners and hosters of the current community sites and appologizing for stepping on toes.
14.02.2010	116504	4818	592	100	
23.02.2010					Stating that all mails received will no longer be answered, feedback and suggestions still welcome since all mail still will be read.
10.03.2010					Remote skin change introduced. Result of popular sites offering customized skins, but required user-passwords in order to do it remote, bad security -> opening for doing it officially
12.03.2010					Mention on danish gaming-show DR1.
17.06.2010	233458	20000	1105	228	
01.07.2010					bitmob.com-review, praising the emergent storytelling and concept of Minecraft
03.07.2010				400	
11.07.2010	263072	27111	1458	501	
19.07.2010					No longer offer per-case support on technical issues, but accepting bugreports and other feedback on mail
19.07.2010					Search for daglig leder through the blog.
28.07.2010					Mention on TF2-blog
29.07.2010					PC-gamer interview
29.07.2010	297648	37906	4462	1001	
04.08.2010					Survival Multiplayer released
07.08.2010					Review on gamer.no
10.08.2010					Rock, paper, swhotgun review
25.08.2010					Paypal freezes account, retaining ca 600000 euros because of exceeding activity on the account
26.08.2010					Web server overloaded, to many registrations
06.09.2010					Hiring people, starting Mojang, add on blog
13.09.2010					Announcing two new coworkers and Mojang-employees, daglig leder + secret guy (Jakob)
14.09.2010					Notch on piracy
17.09.2010					Penny Arcade comic on Minecraft
18.09.2010					Increasing server problems

Date					Event
18.09.2010					Server problems and transition to Amazon Cloud leads to free weekend, 18.-20. sep
20.09.2010					Review on australian television
22.09.2010					Several services over to Amazon S3 to relieve the server
27.09.2010					Indiegames.com podcast with notch
27.09.2010					PCGamer Notch-frontpage and plug
30.09.2010		279055			
04.10.2010		320000			
20.10.2010					Ddos attack on minecraft.net
22.10.2010					Papers signed, Mojang created, server hardware upgraded
29.10.2010	1600000	500000			New company office spaces rented, from 1.jan 2011
02.11.2010	1683998	533451	20871	6863	
04.11.2010	1727613	547544	19300	6030	
05.11.2010	1745621	553057	19704	6177	
06.11.2010	1756277	556654	20495	6591	
08.11.2010	1802537	571335	17558	5449	
11.11.2010	1856719	587473	18177	5093	
15.11.2010	1927879	607256	15237	4484	
18.11.2010	1973852	619705	14087	3821	
19.11.2010	1991584	624665	16103	4378	
19.11.2010					Two new employes introduced, starting Dec 1.
20.11.2010	2005930	628348	18686	5116	
22.11.2010	2044508	639120	15505	4171	
23.11.2010	2060563	643453	15785	4237	
26.11.2010	2099029	654080	17581	5005	New add searching for people, coders front and backend
29.11.2010					GetSatisfaction-account created, to handle bugreports and requests
30.11.2010	2178164	676377	16159	4529	
01.12.2010	2198396	682127	16010	4451	
02.12.2010	2213962	685749	15566	4417	
06.12.2010	2281133	706387	17213	5002	
07.12.2010	2299403	711405	15949	4334	
08.12.2010	2315005	715723	14946	4124	Complaints on level of support
09.12.2010	2328288	719168	14946	3889	
10.12.2010	2347524	724274	16151	4261	
11.12.2010	2372143	733371	23199	8583	
12.12.2010	2239162	741153	24767	10592	

13.12.2010	2416848	752424	19618	8343	First Minecraft merchandise appeared on Thinkgeek
14.12.2010	2432828	759048	19736	8471	
15.12.2010	2454632	767976	22056	9040	
16.12.2010	2483194	780984	25127	11310	New version of Minecraft.net up, gift-cards added
18.12.2010	2514949	797975	25723	13531	
19.12.2010	2539330	812542	27633	16467	
20.12.2010	2578275	842554	32919	26191	Minecraft enter beta, price up to 14,95 euro
21.12.2010	2601762	850811	23629	8318	
22.12.2010	2635040	858480	21040	4994	
25.12.2010	2694999	879426	19694	13052	
27.12.2010	2719615	888495	20761	7255	
28.12.2010	2756979	899606	23324	6765	
29.12.2010	2778366	905458	23600	6583	
30.12.2010	2802664	912362	23507	6655	
31.12.2010	2822273	917575	22997	6308	Because our stats are weird at the moment, "bought" refers to an account getting premium status. This can be done by either purchasing the game directly, or by activating a gift code. Unredeemed gift codes don't show up in these stats currently.
					Minecraft named PC Gamer UK's game of the year
01.01.2011					Two new employes introduced
02.01.2011	2873775	930705	28319	7237	
03.01.2011	2904334	938509	26022	6342	
05.01.2011	2957538	951237	26671	6357	
06.01.2011	2984082	957479	27021	6383	
10.01.2011	3109100	987269	28293	6445	
11.01.2011	3131042	991445	29447	6441	
12.01.2011	3169643	1000095	33571	7512	Million sales
18.01.2011	3349870	1049188	29968	8357	Serverupgrade for minecraft.net
30.01.2011	3722356	1150075	36423	10571	
02.02.2011	3801930	1173544	31062	8736	
07.02.2011	4008988	1231017	33162	9076	
15.02.2011	4264179	1298837	30726	8049	
17.02.2011	4327259	1314891	32851	8153	
21.02.2011					New game launcher up, added security and reducement of effort
22.02.2011	4518373	1366257	34185	9699	Documentary film-crew starting filming on Minecraft documentary

Date					Notes
02.03.2011					Minecraft server down
03.03.2011					Five awards won , 2 IGF and 3 GDCA
11.03.2011	5215178	1559758	38345	9605	
17.03.2011	5415415	1609898	36000	8533	Warning against mods stealing PW's
24.03.2011	5701741	1678641	34884	8267	
30.03.2011	5929261	1734163	35531	8267	
03.04.2011	6148398	1789335	51935	13535	
05.04.2011	6198925	1801238	43525	10196	
07.04.2011					11.11.2011 announced as the release date of Minecraft
12.04.2011	6553239	1888861	37775	9690	
16.04.2011	6681845	1919612	44331	11301	
18.04.2011	6775407	1943550	43988	11399	
23.04.2011	6987060	1993319	48351	11448	
25.04.2011					2 million sales
26.04.2011					Official plans for mod-support announced, mod-licenses
29.04.2011	7252085	2059275	42386	9667	
24.05.2011	8299278	2293830	39804	8042	
30.05.2011	8585042	2355665	47223	13148	
01.06.2011	8707644	2384509	44106	10656	

Appendix B1

Economic model for Minecraft based on estimates and data gathered

Number of users per June 6. 2011	2434327
Number of users buying before beta	842554
Registered users per June 6. 2011	8916101
Price before beta	€ 9,95
Price after beta	€ 14,95
PayPal transaction percentage of transfer	2,2 %
PayPal transaction base fee	€ 0,35
Estimated good salary in Sweden	€ 70 000
Estimated months of work on the game	70
Payroll tax in Sweden 2011	37 %
Office space rental costs, Stockholm 2011 per m² per year	€ 440
Estimated office size in m²	200
Estimated number of games started each day in average	2 000 000
Estimated data downloaded per user per play in MB	10
Estimated monthly data usage in MB	600 000 000
Estimated size of one account in MB	5
Estimated monthly data usage transfer in GB	585 938
Estimated storage needed in GB	43 536
Amazon S3 price per GB, transfer in, US dollars	$ 0,10
Amazon S3 price per GB, transfer out, US dollars	$ 0,08
Amazon S3 price per GB per month, storage, US dollars	$ 0,12
Dollar to euro conversion rate	0,68
Corporate income tax level, Sweden 2011	26,3 %

Average case scenario

Revenue	
Revenue on sales before beta	€ 8 383 413
Revenue on sales after beta	€ 23 797 007
Total revenue per June 6. 2011	€ 32 180 420
Transaction costs	
Transaction costs before beta	€ 479 329
Transaction costs after beta	€ 1 080 655
Total transaction costs	€ 1 559 984
Salary costs	
Salary costs	€ 408 334
Salary employer taxes	€ 151 084
Total salary costs	€ 559 418
Office rental	
Office rental per year	€ 88 000
Miscellaneous costs	
Estimated miscellaneous costs	€ 100 000
Bandwidth	
Bandwidth costs in, per month in dollars	$ 58 594
Bandwidth costs out, per month in dollars	$ 46 875
Total bandwidth costs, per year in euro	€ 860 628
Storage	
Total storage costs in euro	€ 42 631
Total estimated revenue	€ 32 180 420
Total estimated costs	€ 3 210 661
Total estimated EPIDTA result	€ 28 969 759
Corporate tax cost	€ 7 619 047
Estimated Net Income	€ 21 350 712

	Best case scenario	Worst case scenario
Number of users per June 6. 2011	2434327	2434327
Number of users buying before beta	800000	875000
Registered users per June 6. 2011	8916101	8916101
Price before beta	€ 9,95	€ 9,95
Price after beta	€ 14,95	€ 14,95
PayPal transaction percentage of transfer	1,9 %	2,4 %
PayPal transaction base fee	€ 0,35	€ 0,35
Estimated good salary in Sweden	€ 60 000	€ 100 000
Estimated months of work on the game	60	75
Payroll tax in Sweden 2011	37 %	37 %
Office space rental costs, Stockholm 2011 per m^2 per year	€ 300	€ 440
Estimated office size in m^2	100	300
Estimated number of games started each day in average	1500000	2500000
Estimated data downloaded per user per play in MB	5	15
Estimated monthly data usage in MB	225000000	1125000000
Estimated size of one account in MB	1	10
Estimated monthly data usage transfer in GB	219727	1098633
Estimated storage needed in GB	8707	87071
Amazon S3 price per GB, transfer in, US dollars	$ 0,10	$ 0,10
Amazon S3 price per GB, transfer out, US dollars	$ 0,08	$ 0,08
Amazon S3 price per GB per month, storage, US dollars	$ 0,12	$ 0,12
Dollar to euro conversion rate	0,68	0,68
Corporate income tax level, Sweden 2011	26,3 %	26,3 %

Revenue	Best case		Worst case	
Revenue on sales before beta	€	7 960 000	€	8 706 250
Revenue on sales after beta	€	24 433 189	€	23 311 939
Total revenue per June 6. 2011		€ 32 393 189		€ 32 018 189
Transaction costs				
Transaction costs before beta	€	431 240	€	515 200
Transaction costs after beta	€	1 036 246	€	1 105 251
Total transaction costs	€	1 467 486	€	1 620 451
Salary costs				
Salary costs	€	300 000	€	625 000
Salary employer taxes	€	109 800	€	228 750
Total salary costs	€	409 800	€	853 750
Office rental				
Office rental per year	€	30 000	€	132 000
Miscellaneous costs				
Estimated miscellaneous costs	€	20 000	€	20 000
Bandwidth				
Bandwidth costs in, per month in dollars	€	21 973	€	109 864
Bandwidth costs out, per month in dollars	$	17 578	$	87 891
Total bandwidth costs, per year in euro	€	322 738	€	1 613 678
Storage				
Total storage costs in euro	€	8 527	€	85 261
Total estimated revenue		€ 32 393 189		€ 32 018 189
Total estimated costs		€ 2 258 551		€ 4 325 140
Total estimated EPIDTA result		€ 30 134 638		€ 27 693 049
Corporate tax cost	€	7 925 410	€	7 283 272
Estimated Net Income		€ 22 209 228		€ 20 409 777

Appendix B2

Economic model for Minecraft based on estimates and data gathered – Average case scenario

Number of users per June 6. 2011	2434327
Number of users buying before beta	842554
Registered users per June 6. 2011	8916101
Price before beta	9,95
Price after beta	14,95
PayPal transaction percentage of transfer	0,022
PayPal transaction base fee	0,35
Estimated good salary in Sweden	70000
Estimated months of work on the game	70
Payroll tax in Sweden 2011	0,37
Office space rental costs, Stockholm 2011 per m^2 per year	440
Estimated office size in m^2	200
Estimated number of games started each day in average	2000000
Estimated data downloaded per user per play in MB	10
Estimated monthly data usage in MB	=C17*C18*30
Estimated size of one account in MB	5
Estimated monthly data usage transfer in GB	=ROUNDUP((C19/1024);0)
Estimated storage needed in GB	=((C7*C20)/1024)
Amazon S3 price per GB, transfer in, US dollars	0,1
Amazon S3 price per GB, transfer out, US dollars	0,08
Amazon S3 price per GB per month, storage, US dollars	0,12
Dollar to euro conversion rate	0,68
Corporate income tax level, Sweden 2011	0,263

Average case scenario

Revenue	
Revenue on sales before beta	=ROUNDUP(C6*C8;0)
Revenue on sales after beta	=ROUNDUP((C5-C6)*C9;0)
Total revenue per June 6. 2011	=ROUNDUP(C30+C31;0)
Transaction costs	
Transaction costs before beta	=ROUNDUP(((C8*C10)+C11)*C6;0)
Transaction costs after beta	=ROUNDUP(((C9*C10)+C11)*(C5-C6);0)
Total transaction costs	=C35+C36
Salary costs	
Salary costs	=ROUNDUP((C12/12)*C13;0)
Salary employer taxes	=ROUNDUP(C40*C14;0)
Total salary costs	=ROUNDUP(C40+C41;0)
Office rental	
Office rental per year	=ROUNDUP(C15*C16;0)
Miscellaneous costs	
Estimated miscellaneous costs	100000
Bandwidth	
Bandwidth costs in, per month in dollars	=ROUNDUP(C21*C23;0)
Bandwidth costs out, per month in dollars	=C21*C24
Total bandwidth costs, per year in euro	=ROUNDUP(((C51+C52)*12)*C26;0)
Storage	
Total storage costs in euro	=ROUNDUP(C22*C25*C26*12;0)
Total estimated revenue	=C32
Total estimated costs	=C37+C42+C45+C48+C53+C56
Total estimated EPIDTA result	=C59-C60
Corporate tax cost	=ROUNDUP(C61*C27;0)
Estimated Net Income	=C61-C63

	Best case scenario	**Worst case scenario**
Number of users per June 6. 2011	2434327	2434327
Number of users buying before beta	800000	875000
Registered users per June 6. 2011	8916101	8916101
Price before beta	9,95	9,95
Price after beta	14,95	14,95
PayPal transaction percentage of transfer	0,019	0,024
PayPal transaction base fee	0,35	0,35
Estimated good salary in Sweden	60000	100000
Estimated months of work on the game	60	75
Payroll tax in Sweden 2011	0,366	0,366
Office space rental costs, Stockholm 2011 per m² per year	300	440
Estimated office size in m²	100	300
Estimated number of games started each day in average	1500000	2500000
Estimated data downloaded per user per play in MB	5	15
Estimated monthly data usage in MB	=F17*F18*30	=H17*H18*30
Estimated size of one account in MB	1	10
Estimated monthly data usage transfer in GB	=ROUNDUP((F19/1024);0)	=ROUNDUP((H19/1024);0)
Estimated storage needed in GB	=((F7*F20)/1024)	=((H7*H20)/1024)
Amazon S3 price per GB, transfer in, US dollars	0,1	0,1
Amazon S3 price per GB, transfer out, US dollars	0,08	0,08
Amazon S3 price per GB per month, storage, US dollars	0,12	0,12
Dollar to euro conversion rate	0,68	0,68
Corporate income tax level, Sweden 2011	0,263	0,263

Revenue	Best case scenario
Revenue on sales before beta	=ROUNDUP(F6*F8;0)
Revenue on sales after beta	=ROUNDUP((F5-F6)*F9;0)
Total revenue per June 6. 2011	=ROUNDUP(F30+F31;0)
Transaction costs	
Transaction costs before beta	=ROUNDUP(((F8*F10)+F11)*F6;0)
Transaction costs after beta	=ROUNDUP(((F9*F10)+F11)*(F5-F6);0)
Total transaction costs	=F35+F36
Salary costs	
Salary costs	=ROUNDUP((F12/12)*F13;0)
Salary employer taxes	=ROUNDUP(F40*F14;0)
Total salary costs	=F40+F41
Office rental	
Office rental per year	=ROUNDUP(F15*F16;0)
Miscellaneous costs	
Estimated miscellaneous costs	20000
Bandwidth	
Bandwidth costs in, per month in dollars	=ROUNDUP(F21*F23;0)
Bandwidth costs out, per month in dollars	=F21*F24
Total bandwidth costs, per year in euro	=ROUNDUP(((F51+F52)*12)*F26;0)
Storage	
Total storage costs in euro	=ROUNDUP(F22*F25*F26*12;0)
Total estimated revenue	=F32
Total estimated costs	=F37+F42+F45+F48+F53+F56
Total estimated EPIDTA result	=F59-F60
Corporate tax cost	=ROUNDUP(F61*F27;0)
Estimated Net Income	=F61-F63

Revenue	Worst case scenario
Revenue on sales before beta	=ROUNDUP(H6*H8;0)
Revenue on sales after beta	=ROUNDUP((H5-H6)*H9;0)
Total revenue per June 6. 2011	=ROUNDUP(H30+H31;0)
Transaction costs	
Transaction costs before beta	=ROUNDUP(((H8*H10)+H11)*H6;0)
Transaction costs after beta	=ROUNDUP(((H9*H10)+H11)*(H5-H6);0)
Total transaction costs	=H35+H36
Salary costs	
Salary costs	=ROUNDUP((H12/12)*H13;0)
Salary employer taxes	=ROUNDUP(H40*H14;0)
Total salary costs	=H40+H41
Office rental	
Office rental per year	=ROUNDUP(H15*H16;0)
Miscellaneous costs	
Estimated miscellaneous costs	20000
Bandwidth	
Bandwidth costs in, per month in dollars	=ROUNDUP(H21*H23;0)
Bandwidth costs out, per month in dollars	=H21*H24
Total bandwidth costs, per year in euro	=ROUNDUP(((H51+H52)*12)*H26;0)
Storage	
Total storage costs in euro	=ROUNDUP(H22*H25*H26*12;0)
Total estimated revenue	=H32
Total estimated costs	=H37+H42+H45+H48+H53+H56
Total estimated EPIDTA result	=H59-H60
Corporate tax cost	=ROUNDUP(H61*H27;0)
Estimated Net Income	=H61-H63