TAMPEREEN TEKNILLINEN YLIOPISTO
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POTENTIAL AND ROLES OF GAMING COMMUNITIES AND
COMMUNITY MANAGEMENT IN PC BASED VIDEO GAME
COMPANIES

Master of Science Thesis

ABSTRACT

Video games have grown into a multibillion dollar industry and is expected to exceed 118 billion dollars by 2019. In the past 20 years, the video game industry has become a serious contributor in global entertainment industries. 63% of U.S. households have at least one person who plays video games more than 3 hours per week and 65% of the households own a device used to play video games.

The relationship between players and game developers or publishers has become an important part of the business model in the games industry. By utilizing the gaming community, it is possible to generate more content for the game with the same the development budget. Some video game companies have successfully outsourced parts of the game design and development process to customers by enabling consumers to implement their own creations into the final product.

The goal of the study is to understand the potential and roles game communities have in relation to the PC based game companies, and the effects community management has on them. The creative and innovative capacities of communities have been studied for over a decade, but how the firms actually handle the communities of users and what the nature of their relationship is has not received enough attention. To get more information about this relationship a survey for game industry professionals and players was created. The scope of the study was limited to PC games.

From the respondents of the survey five user groups were identified: average users, players, testers, developers and professional game developers. Average users seek information while players, testers and developers contribute to game development as well as help other users and contribute to the community. The presence of the professional game developers in the community is important as it helps to create trust and communication with the users motivates knowledge sharing.

TIIVISTELMÄ

Emmi Hallikainen: Peliyhteisöjen ja yhteisöjohtamisen potentiaali ja roolit PC-peliyrityksille
Tampereen teknillinen yliopisto
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Avainsanat: pelinkehitys, peliyhteisöt, yhteisöjohtaminen

Videopelit ovat kasvaneet merkittäväksi osaksi viihdeteollisuutta viimeisen 20 vuoden aikana. Videopeliteollisuuden odotetaan ohittavan 118 miljardin dollarin tulotason vuoteen 2019 mennessä. 63% Yhdysvaltojen kotitalouksissa on ainakin yksi asukas, joka pelaa yli kolme tuntia videopelejä viikossa ja 65 % kotitalouksista omistaa laitteen, jota käytetään videopelien pelaamiseen.

Pelaajien ja pelinkehittäjien suhde on tärkeä osa alan liiketoimintaa. Peliyhteisöjen hyödyntämisen avulla on mahdollista tehdä pelejä, jotka vastaavat asiakastarpeisiin ja joissa on enemmän sisältöä kuin pelinkehittäjällä olisi mahdollista tehdä itse suunnitellussa budjetissa. Sallimalla modifikaatioiden tekeminen ja tarjoamalla pelaajille pelinkehityseditoreja pelaajat pystyvät luomaan omaa lisäsisältöä valmiin pelin päälle. Pelaajat jakavat omia luonnoksiaan muille pelaajille tarjoten vaihtelua peliin myös tavalliselle pelaajille, jotka eivät itse osaa tai halua tehdä lisäsisältöä peliin.

Tämän tutkimuksen tavoitteena on tarkastella peliyhteisöjen roolia ja potentiaalia PC-pelejä kehittävien yritysten näkökulmasta sekä yhteisöjohtamisen vaikutusta peliyhteisöihin ja niiden hyödyntämiseen. Aikaisemmat tutkimukset ovat käsitelleet yhteisöjen innovaatiokapasiteettia, mutta pelifirmojen tapoihin käsitellä yhteisöjä ei ole kiinnitetty huomiota. Tutkimuksessa tehtiin kysely PC-pelien kehittäjille ja pelaajille tavoitteena saada lisätietoa yhteisön ja pelinkehittäjien suhteesta sekä potentiaalisista hyödyntämiskohteista.

Kyselyn vastaajat jaettiin vastausten perusteella viiteen ryhmään: tavalliset käyttäjät, pelaajat, testaajat, kehittäjät sekä pelialan ammattilaiset. Tavalliset käyttäjät etsivät yhteisöistä tietoa ja apua kun pelaajat, testaajat ja kehittäjät auttavat pelinkehityksessä, tuottavat sisältöä yhteisölle sekä auttavat muita. Pelinkehitysfirman läsnäolo nähdään tärkeänä, koska kommunikaatio pelinkehittäjän kanssa auttaa luottamuksen kasvattamisessa sekä motivoi yhteisön jäseniä jakamaan tietoa.

PREFACE

This Master's Thesis was done in Colossal Order Oy in summer 2016 to spring 2017. The subject of the research is the potential, roles and best practices for managing and utilizing game communities.

I would like to thank Mariina Hallikainen from Colossal Order Oy for the opportunity to do my thesis to this subject and Timo Kellomäki for the feedback. I would also like to thank the supervisor at Tampere University of Technology, Professor Hannu Kärkkäinen, for the help and information I got concerning the research methods and support to finalize the Thesis paper.

Finally, I would like to thank TEA-club and Tupsula for offering the best study environment and support to get this done. Thanks to family and friends for help and guidance.

Emmi Hallikainen

In Tampere, 22 May 2017

CONTENTS

LIST OF SYMBOLS AND ABBREVIATIONS

Alpha	A development phase and a version of a game showing roughly what it will be while missing some features and art. (Bonin 2014)
Beta	A development phase and a version of the game with all the features and almost all of the graphics while still containing bugs and possibly requiring balancing. (Bonin 2014)
DLC	Downloadable content (DLC) is additional content released for a video game. (Bycer 2014)
GDD	A Game Design Document (GDD), which explains the concept and genre, the story, gameplay, visual look and feel of the game (Callelle et al 2005)
Gold Master	In the gold phase the game is ready to be shipped and sold to customers (Bonin 2014)
Modding	Modifying a game. (Sotamaa 2010)
Game analytics	Using data analytics to develop and analyze the behavior of users in their game play sessions. (Niwinski & Randall 2010)
Online community	An online community can be defined as a group of people who share goals and ideas and communicate through the internet (Hsu & Lu 2007; Burger-Helmchen & Cohendet 2011; Gidhagen 2011)
PC	Personal computer, regular home computer (Arakji & Lang 2007)
Video games	An entertainment product that requires active participation from the user called player (Callele et al. 2005).
Web 2.0	Sometimes means the phenomenon of social media, but also used to describe the whole technical aspect of web technologies that allow people to interact, create, share, exchange and comment in virtual communities and networks. (Ahlqvist et al. 2008)

1. INTRODUCTION

1.1 Background and motivation

Video games have grown into a multibillion dollar industry (Arakji & Lang 2007) which is expected to exceed 118 billion dollars by 2019 (Minotti, 2016). In the past 20 years, the video game industry has become a serious contributor in global entertainment industries (Marchand & Hennig-Thurau 2013). 63% of U.S. households have at least one person who plays video games for 3 or more hours per week and 65% of the households own a device used to play video games (ESA 2016).

Developing a relationship between players and game developers or publishers has become an important part of the game industry business model. By utilizing the gaming community, it is possible to generate more content for the game with the same the development budget. (Burger-Helmchen & Cohendet 2011) Some video game companies have successfully outsourced parts of the game design and development process to the customers by enabling consumers to implement their creations into the final product (Arakji & Lang 2007; Banks 2010).

Web 2.0 applications and technologies allow people to easily participate on social media (Ahlqvist et al. 2008), and consumer co-creation relations are becoming more significant in many industries (Banks 2010). The communities are not only making content for games, but they are supporting and advertising the brand and giving feedback and suggestions (Burger-Helmchen & Cohendet 2011). The user communities are a valuable external source of product or service innovation (Hau & Kim 2011). In multiplayer games the community also provides the social aspect of the gaming experience. (Burger-Helmchen & Cohendet 2011) Consumers who actively take part in the community are also more willing to adopt new products from the same company and less likely to embrace competing products (Brodie et al. 2012; Chan et al. 2015).

Consumers' willingness to brainstorm and share ideas depends on the openness and transparency of the communication between the community and the development team, and the company must invest in relationship building (Chan et al. 2015). Brand communities on social media platforms are becoming more important for business, which why marketers and researchers wish to have more insight into them (Laroche et al. 2012). Consumer engagement can lead to trust, satisfaction and emotional attachment, empowerment, and consumer value (Brodie et al. 2012). Customers' trust towards a brand means that an average customer relies on the brand's ability to perform as expected

(Laroche et al 2012). Bad communication between the community and company can also lead to a negative outcome.

1.2 Problem statement and scope

Video game companies are professionalizing their business models, including marketing processes and strategies (Arakji & Lang 2007), and the field has even turned into a forerunner with their modern business models, open innovation and data-analysis. The goal of this thesis is to identify the potential of gaming communities for PC based game development companies, and to understand what kind of role community management has to be able to harness the potential of the communities.

The main research question is:

- What is the potential and what are the roles of gaming communities and community management for PC based video game companies?

To complement the main research question, the following sub-questions are raised:

- What are online gaming communities?
- What are the phases of the game development process?
- How game communities can help with the game development?
- What is community management in game communities?
- What are the motives to take part in game communities?

The scope of the study is limited to PC games, which are played on regular home computers, while console games require specialized hardware, such as a Microsoft Xbox One, a Nintendo Wii or a Sony PlayStation (Arakji & Lang 2007). The development time for a PC game runs from 12 to 36 months which gives more chances to utilize communities compared to mobile games where development time is usually shorter. In the United States, 56% of the most frequent players play on a PC, 53% play on a dedicated games console, 36% on a smart phone, 31% use a wireless device and 17% play on a dedicated handheld system (ESA 2016). PC based video game companies and communities are chosen to the study as they are the most popular platform for gaming.

1.3 Objectives and limitations

Game communities have been previously studied with the limited objective of helping business development. In this thesis, the objective is to see if the common industry understanding of the communities is valid and how they could be utilized in game development.

To stay within the scope of a thesis, the research was conducted using one online survey and by reviewing existing literature. The number of participants in the survey was higher than expected, but because most of the questions are multiple choice and only a few are open-ended, it is possible to handle them all within the scope of the thesis.

1.4   Previous research on this topic

The video games industry has recently been studied regarding innovation management and organizational architecture (Zackariasson et al., 2006; Tschang, 2007; Arakji and Lang, 2007; Hau and Kim, 2011). Academic research conducted on games has increased, but they still receive less attention than other entertainment industries such as cinema, television or music (Marchand & Hennig-Thurau 2013).

Burger-Helmchen & Cohendet (2011) state that recent literature has underlined the main character of video game firms delegating part of the production and competitive knowledge to gaming communities. Game modifications and their makers have been studied a bit, but according Sotamaa (2010), modification makers' actions and practices are under researched. Modifications are a form of player production that have had an essential part in PC gaming since the 90s. They are digital artefacts, made by players, to modify their favorite games. Sotamaa has studied the motivations behind the computer game modification culture, but the focus of game modification research is more on their educational potential. Studies exist of online gaming communities in Massive Multiplayer Online Games (MMOG), but they are mainly focused on group dynamics and player motivations. (Hsiao & Chiou 2012: Patil et al. 2012)

The creative and innovative capacities of communities have been studied for over a decade, but existing literature lacks information on the nature of user communities, the ways companies handle large or specialized smaller communities and the nature of their relationships. (Burger-Helmchen & Cohendet 2011) Laroche et al. (2012) state that more research is also needed to introduce effective techniques on managing a dissatisfied community upset with the brand. Also, co-creation that happens when customers interact with each other is under studied and is not seen as a potential source of value co-creation (Rihova et al. 2013).

The communities that create new software or ideas are studied by innovation scholars while the consumer communities have been receiving attention from marketing scholars. In the context of video games, these should not be separated, as users can both develop as well as consume products at the same time. How to harness the communities is often looked at from the point of view of open source software, which is not the common case with video game companies. (Burger-Helmchen & Cohendet 2011) Research into virtual brand communities has not been able to create a clear concept of consumer engagement, but does provide a base for empirical studies (Brodie 2013). Virtual communities are groups of people who have common interests towards knowledge sharing in specialized

fields or subjects. They interact with each other using the internet as a communication channel. The platform itself does not enable knowledge sharing, as social interactive issues influence the members' will to interact. (Chen & Hung 2010)

1.5   Thesis outline

Theory will be presented in chapter 2, which explains the phases of the game development process, how value creation happens in the games industry and what are the different types of gaming communities and community members. User and company motivations to take part to communities are considered as well as practices of community management. Game analytics is also explained briefly.

Research methods are explained in chapter 3, and chapter 4 covers the survey results. Chapter 5 combines theory and survey results together in analysis. Conclusions are made in chapter 6, which also includes a review of the thesis and maps the potential of expanding the scope of the study. References are collected after chapter 6. Appendix A presents the survey questions and appendix B the answers received.

2. THEORY AND BACKGROUND

2.1 Game development process

Video games are entertainment products that require active participation from the users, called players (Callele et al. 2005). Video games are a complex mix of technology, art and interactive storytelling (Burger-Helmchen & Cohendet 2011), and they are developed by multi-disciplinary teams (Callele et al. 2005).

The process of game development can be divided into two phases: preproduction and production (Callelle et al 2005). Production is followed by a post-production phase where the game is distributed and marketed to consumers. This can either be handled by the publisher or by the developer in case the game is self-published (Aktas & Orcun 2016). The preproduction phase results in a Game Design Document (GDD), which explains the concept and genre, the story behind the game, gameplay mechanics, and the look and feel of the game. The GDD is usually created by a game designer or a game design team. Once the GDD is ready the actual production, which is close to a traditional iterative software development process, can start. It includes the creation of graphics, implementation of planned features and the balancing of game elements (Callelle et al 2005).

The preproduction phase is important because at that point changes are still cheap to make compared to changes done once implementation is already underway. Prototyping gameplay is challenging and it is difficult to assess player experience from early version of the game, because the game engine infrastructure is still a work in progress. Gameplay testing can only begin once gameplay features are more comprehensively present in the game. (Callele et al. 2005)

In this thesis, the production phase is divided into alpha, beta and gold phases which are commonly used industry milestones as illustrated in figure 1. In the alpha phase, the game still has missing features and artwork, and is altogether just a rough version of what the final product will be. Reaching the beta phase usually means all features and almost all of the graphics are present, but bugs still exist and game elements might still need balancing. (Bonin 2014) A beta version is released to an exclusive group of players within the community who can then play and test the game over a limited period of time. Their goal is to find bugs and report them to the game developer. (Gidhagen et al. 2011) Once in the gold phase, the game should be ready to be shipped and sold for customers (Bonin 2014).

Game development process				
Pre-production		Production		Post-production
Concept		Alpha		Distribution
Gameplay		Beta		Marketing
Story		Gold		
GDD				
Idea				Ready product

Figure 1.   *Game development process (Modified Callele et al. 2005; Bonin 2014)*

If the game has a publisher, they usually take care of the post-production part of the development process, meaning they handle the distribution and marketing (Aktas & Orcun 2016). Previously, games were distributed on physical disks, but the industry is moving toward digital distribution channels. From 2010 to 2015 the ratio of physically distributed games has dropped from 71% to 44%, and the number of digitally distributed games rose by the same amount, as seen in figure 2 (ESA 2016).
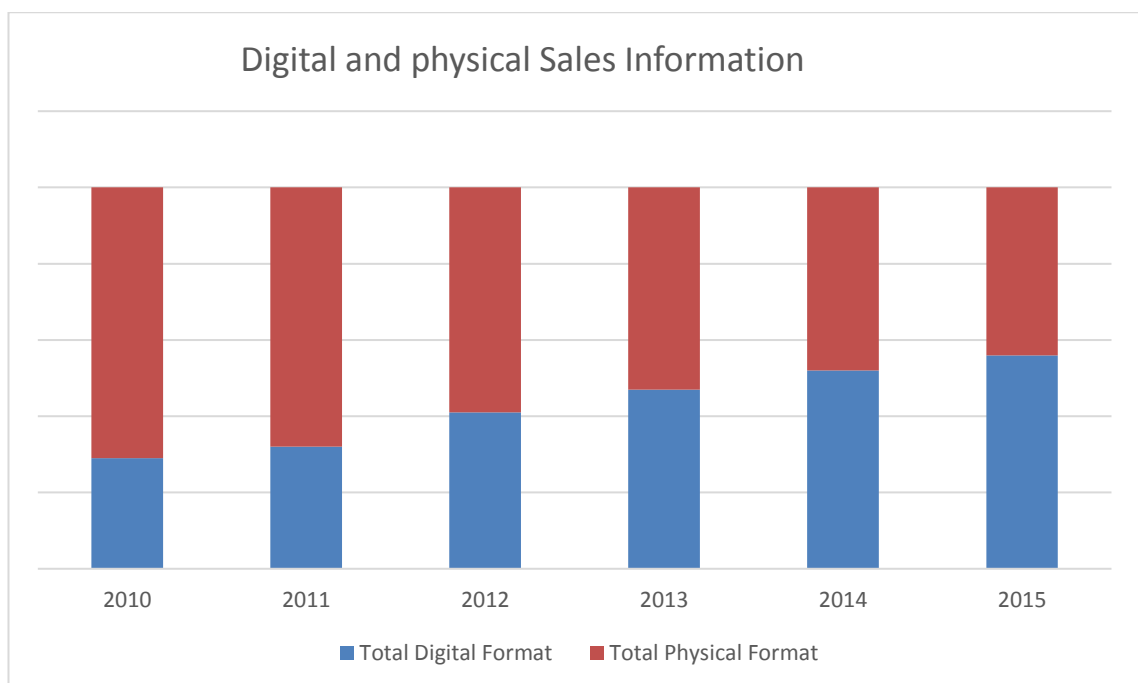

Figure 2.   *Video game distribution channels (ESA 2016)*

Digital distribution has enabled post-release free updates, DLC and expansion sales for existing games, providing them with a longer lifespan (Bycer 2014).

2.2 Value creation in game industry

In terms of economic value, the video game industry has grown from a small industry into an important part of the entertainment industry. Americans spend more time playing video games than going to movies, and the revenues in video game industry are five times higher than global music revenues. Figure 3 shows the gaming environment, and the distribution and communication channels of the industry. Game platforms are console producers like Sony and Microsoft, who provide the gaming tools for game consumers, i.e. players. They, in turn, buy the games via digital channels, such as the console's own store or from Valve Corporation's online game platform, Steam. Physical channels are game stores or markets, which sell physical copies of the games. Communication channels consist of magazines and social media platforms, such as forums, Facebook, Twitter, Twitch, and YouTube. (Marchand et al. 2013)

Social media consists of text, pictures, videos and networks. Blogs were the first social media and rely mostly on text. Blogs are websites maintained and written by individuals, and a blog post may include text, graphics, videos and links to other blogs or web pages. Micro-blogs, like Twitter, are services that allow users to write, share and read short messages and pictures. Flickr and Instagram allow users to share and store images, and video-sharing websites like YouTube permits users to store, share, watch and comment on videos. Networks, for example Facebook, enable users to find and add contacts, send messages to other users, and provide personal information. (Berthon et al. 2012) They also enable interactive customer experiences, which can enhance customer engagement with a specific brand (Brodie 2013).
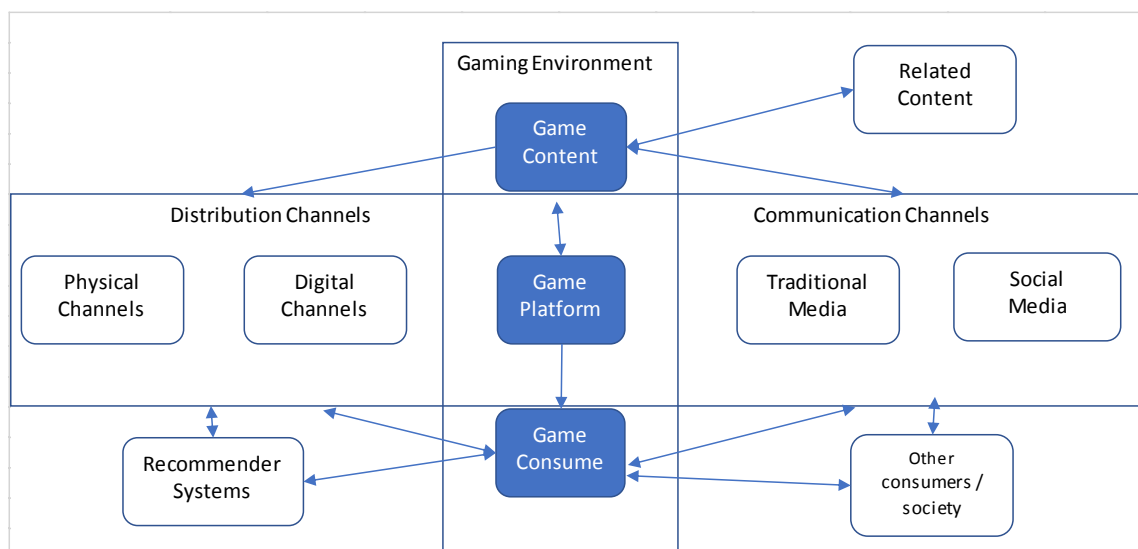
Figure 3. *Game industry environments (Marchand, A. and Hennig-Thurau, T., 2013.)*

For the consumer, video games can be thought of as movies or novels where the quality of the product is based on experience. Consumers know whether they like the game or not only after playing it, which influences their decision making. (Marchand, A. and Hennig-Thurau, T., 2013.) To make the purchase decision, players can seek information via communication channels to determine if the game is something they might like.

Nowadays, there are many different types of games: multiplayers, single-players, offline and online games (Gidhagen 2011). The traditional business model in the games industry has been to sell the game for a fixed price, which then allows the consumer to play it for as long as they want. In online games and MMOGs a fee is charged, typically monthly, such as in World of Warcraft, in order to be able to play the game. Further types include so called hybrids, where the player first buys the base game for fixed price and then pays a periodic fee to be able to play online, such as in Star Wars: The Old Republic. Smartphone and social network games have adopted a free-to-play model, where the game is available for free but is restricted by a certain time period or a number of in-game actions. Buy paying, players can use more actions or unlock some elements that help them move forward in the game. (Marchand, A. and Hennig-Thurau, T., 2013.) In-app sales allow the player to buy additional characters or equipment, such as in Farmville, a Facebook social game, where the player can buy Farmbucks with which they can then buy limited edition animals for their farm, for example. In April 2010, Farmville had over 70 million users. Digital distribution channels have enabled games to have new game features and updates delivered via internet, which prolong their lifespan, as gamers can be more active and receive new content after the initial game publication. Half-Life's modification, Counter-Strike, was released in 1999, and it's still being played. (Gidhagen et al 2011).

Value creation in the games industry involves the game developer as well as actors outside of the company. Value-in-use can be created outside of the game developer's influence, which is what happened with Half-Life's modification Counter-Strike, for example. A player called Minh Le made a popular addition to the game using a development kit provided by the game developer. The foundation for this value creation was the bundled toolkit offered by the developer, which allowed modifying the product. In the case of Counter-Strike, it created an entirely different experience that grew from outside the control of the game developer (Marchand, A. and Hennig-Thurau, T., 2013). Value-in-use is experienced by the customer, which in turn makes the customer a co-creator of value. A successful Playstation 3 game, Little Big Planet, utilized co-creation by offering tools for players with which they could create their own levels for the game and share them with other players. With games like Little Big Planet and Farmville, the gaming experience itself is not the core feature, whereas the ability to show other players what you have created is (Gidhagen et al 2011).

Game developers can also be seen as sources of inspiration for modders, where the base game and its development toolkits provide the value propositions to the players. The game developer is a facilitator who allows discussions between players from different parts of the world (Gidhagen et al 2011). Toolkits also aim to encourage customers who do not possess special skills to try out their creativity. Toolkits can be designed with either user innovation or co-creation and customization in mind. Innovation tools provide needed information and aids, such as a piece of drawing software, while customization toolkits are ready-made modules which the customer can use in a limited number of ways (Piller et al. 2011). Where a customization toolkit might, for example, allow the user to change the outfit of a game character, an innovation toolkit could provide the consumer with the means to make completely new kinds of outfits.

2.3   Gaming communities

An online community can be defined as a group of people who share goals and ideas and communicate through the internet (Hsu & Lu 2007; Burger-Helmchen & Cohendet 2011; Gidhagen 2011), unlike traditional media where individuals consume content passively (Laroche et al. 2012). The members of a community can come from any geographical location and have any ethnic background (Hsu & Lu 2007; Burger-Helmchen & Cohendet 2011; Gidhagen 2011). Communities of users are very diverse, and different types of communities bring different advantages to the game company, but also require different kinds of methods to maintain (Burger-Helmchen & Cohendet 2011).

A virtual community is expected to fill the need for communication, information, and entertainment for its members (Hsiu-Fen & Lin 2006). Gaming communities are places where members share their common interest for a certain game or game genre, but they can have wildly varying focuses (Hsu & Lu 2007; Burger-Helmchen & Cohendet 2011). With digital environments, these communities have become a source of collective expertise on individual topics (Laroche et al. 2012).

In a game community, users post and respond to comments, share their feedback and suggestions about the game, and even suggest entirely new game ideas. They also share their game experiences and provide user-created content for others. On the official community forums for Forza Motorsport III, users are even allowed to sell and buy their customized cars which is enabled by the game developer, who has facilitated the creation, marketing and transactions of customizations between users. (Gidhagen 2011) They can also be thought of as crowdsourcing communities for ideas, where consumers can present their creativity, collaborate with other consumers, and do collective brainstorming (Chan 2015).

Different types of game communities create different kinds of value for the games industry (Burger-Helmchen & Cohendet 2011). Game companies should see online communities as a market place, since the members are current or future customers (Hsiu-

Fen & Lin 2006). With the help of social software that allows users to interact and share data, communities are able to capture, store and present communication in the form of text, audio and video. A growing number of media production services and distributive platforms have enabled a notion of participatory culture and activities such as wiki-editors, bloggers and Youtubers (Hong, Chen 2013). A study by Hsiu-Fen and Lin (2006) found that 43% of the respondents from a group of 165 community members spent over 5 hours per week in the virtual community. Community members, who spend the most time in the community and are skillful in helping others or actively giving suggestions for the game developer, have the most influence in the community (Gidhagen 2011).

Companies can establish and maintain their connection to users by providing community building mechanics, such as a game forum and a wiki. Wiki is a website which can be modified by the users collaboratively. An internet forum can be an essential tool for collaborative work and organizational learning. (Burger-Helmchen & Cohendet 2011)

Burger-Helmchen and Cohendet (2011) divide gaming communities into four different types: average users, players, testers and developers. In figure 4, community types are categorized based on two dimensions: how much the community is expected to work and whether the community is more oriented towards gaming or technology. The pyramid shape represents the size of the community – the higher you go, the smaller and more specialized the community is. On higher levels, communities can be more autonomous from the company perspective (Burger-Helmchen & Cohendet 2011), but at the same time create a lot of value, like in the case of the modification community who created the hugely successful Counter-Strike modification for Valve's game Half-Life (Arakji & Lang 2007).

Types of gaming communities
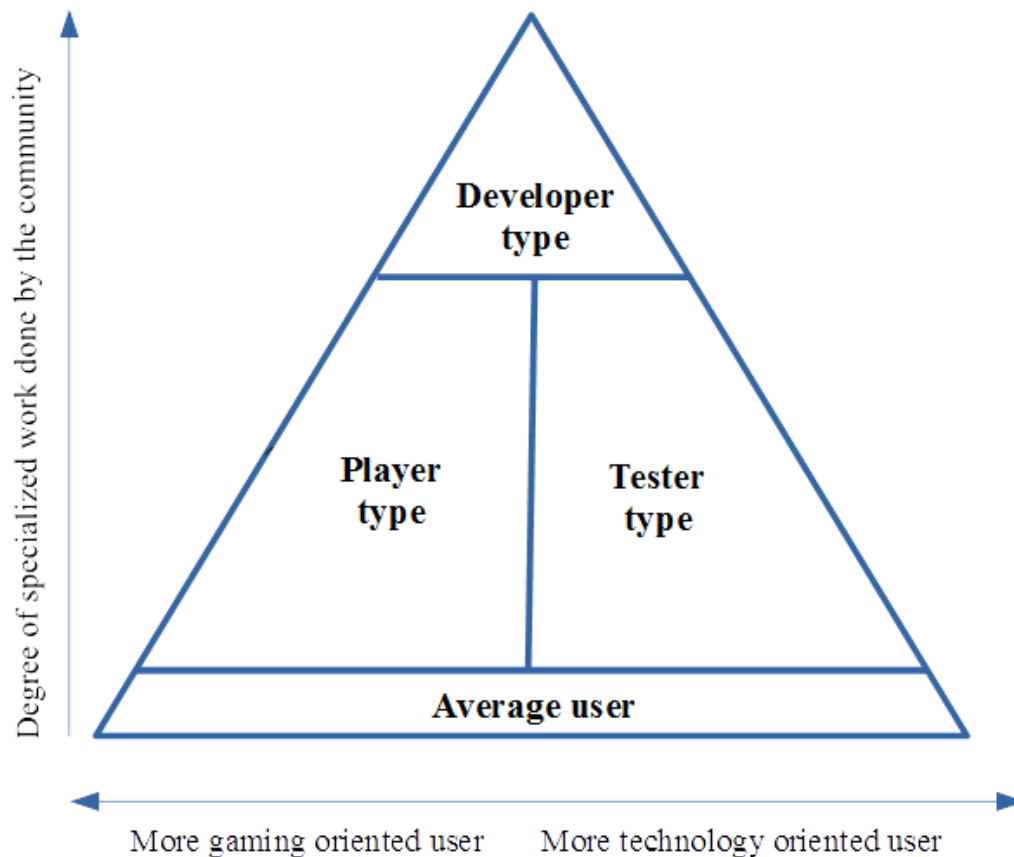
Figure 4. *Types of gaming communities. Modified from Burger-Helmchen & Cohendet 2011.*

On the ground floor of the pyramid, a game is developed by a company without needing help from the communities. Some companies want to keep their intellectual property safe from competitors and don't want to allow modifications which require the game development company to open part or all of the code of the product.

User communities have different dimensions depending on the nature of the product. With physical products that cannot be modified, the community is focused on knowledge sharing, and the developer implements the ideas into the final product. Conversely, open source software communities can directly produce, develop, and distribute their creations. Online platforms have enabled users to share their knowledge with lower costs than what would be incurred by participating in an offline community. (Hau & Kim 2011) Communities gather customers together and encourage conversations that provide the company various sources of information regarding their product. (Laroche et al. 2012)

All communities can help reduce the cost of production and add elements to the game after it release. Sometimes companies don't even recognize the work done by communities, and in some cases companies develop games to match specific gaming

community demands. Companies do not always seek to reduce costs, but try to benefit from the creativity of the users. (Burger-Helmchen & Cohendet 2011) At times, companies also co-develop games with the community and turn users into developers (Burger-Helmchen & Cohendet 2011), like Valve who hired the Counter-Strike modifiers (Arakji & Lang 2007).

Paradox Interactive's and Colossal Order's Cities: Skylines city building game was made to support modifications and is a good example of what enabling the community can result in. Just a month after the game's release on 10 March 2015, Steam Workshop had 33 569 mods available (Nunneley 2015), and on 29 September 2016, the game had 93 827 items available for download on Steam Workshop (Valve 2016).

2.3.1 Average users

Average users are those who are interested in having fun with the game, but not interested in improving or modifying it. They have brand loyalty, but do not provide competencies for the game developer. Average users utilize content created by other communities in the form of watching tutorial videos or using mods created by other players, for example. (Burger-Helmchen & Cohendet 2011)

Based on a study from United States, 59% of video game players are male and 41% female. The average age for a male game player is 35 years, and for female game player 44 years. The age division is presented in figure 5. (ESA 2016)
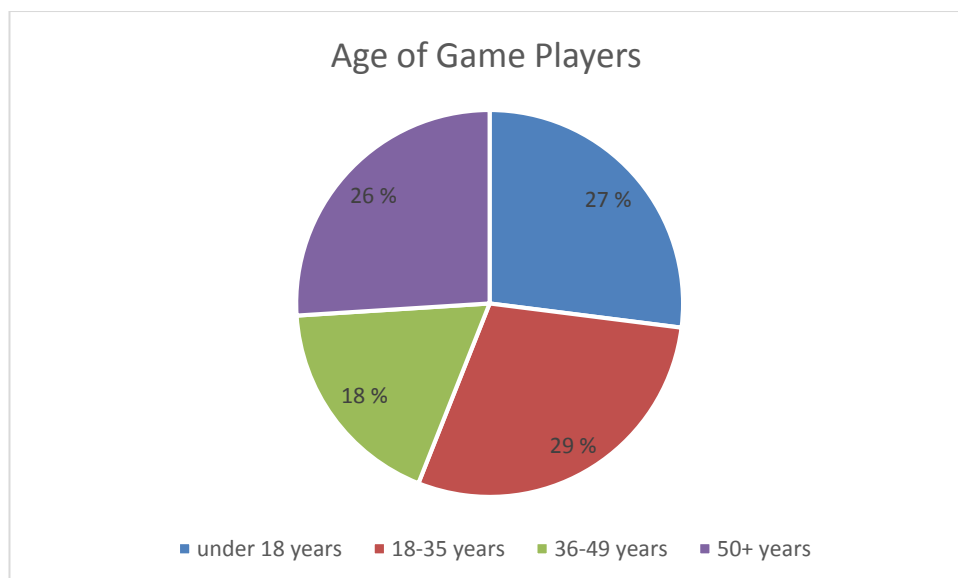

Figure 5.   *Age of game players (ESA 2016)*

The age of players is divided almost evenly between age groups, which means game communities can include people from a variety of ages. Average users may not make

content to the gaming communities, but they utilize them for purchase decisions and for them active gaming community can be a reason they stay with the game and spread word to mouth about the game. Their ways to play to game can be tracked with telemetry so they are meaningful group of users even if they don't create content to the community.

2.3.2 Players

Burger-Helmchen & Cohendet (2011) have named one community type as players, which can be divided into open players, organizers, content builders and tool players. Player communities are not necessarily in direct contact with the game developer even though they are primarily formed around a specific game. Their admiration toward one title can make them interested in other games from the same company. (Burger-Helmchen & Cohendet 2011)

Open players help others by creating blogs, websites, FAQs or tutorial videos about a game to be viewed while out of the game. Open players are consumers who are involved in the promotion of the brand through their self-created advertising videos (Berthon et al. 2012). Players can act as brand enthusiasts, which includes practices like evangelizing, sharing good news and encouraging others to use the brand. (Laroche et al. 2012)

Organizers are a type of community who help other players in the game directly and are most common in massive multiplayer online games where player interaction is possible. (Burger-Helmchen & Cohendet 2011) Organizers can be leaders of guilds (Burger-Helmchen & Cohendet 2011), which are common in massive multiplayer online games where players can create groups to gather resources, knowledge and share adventures together (Hsiao, C.C. and Chiou, J.S., 2012).

Content builders make additional content for a game, such as new game levels, graphics and sounds (Burger-Helmchen & Cohendet 2011) which other players can utilize and freely download from the internet (Arakji & Lang 2007; Burger-Helmchen & Cohendet 2011). Players who make modifications are both embracing and rejecting the rules and limitations of the game as originally designed (Beggs 2012). They are creative customers and can be an important source of ideas and business prospects, as they reveal opportunities that can become sources of revenue and growth for the company. (Berthon et al. 2012)

Tool builders develop tools for other users with which they can create additional content. Map editors are one example of such tools. "Modding" is a term used to describe this kind of modifications of the game. (Burger-Helmchen & Cohendet 2011) Game developers themselves can offer development toolkits for users with which they can modify the game. Average users typically won't use them, but players interested in making modifications will experiment with them. Game toolkits were originally designed for

developers themselves, but releasing toolkits to consumers enables them to create product designs of their own. (Arakji & Lang 2007)

Arakji & Lang (2007) have divided players who make modifications into different levels. First group makes minor changes to the original game that are amateurish in nature and mostly intended for private use. (Arakji & Lang 2007) They are content builders, but because they don't share their work publicly, they don't match Burger-Helmchen & Cohendet's (2011) definition of content builders. Arakji & Lang's (2007) second group make professional quality modifications and share them on the internet for others to use. Their modifications are partial conversions that extend or improve a game. (Arakji & Lang 2007) Modifications made by content builders and tool developers bring variations and extensions to game, which Arakji & Lang (2007) name as partial conversion modifications.

Modifications made by content builders have a potential to increase game revenues and extend the lifespan of the product (Arakji & Lang 2007; Burger-Helmchen & Cohendet 2011). Game companies like Valve, Epic Games and Bethesda Softworks have encouraged users to make modifications resulting in a positive impact on sales. Valve's Half-Life has stayed on top of the charts depicting online usage levels even though the game was originally released in 1998. Its popular modifications, Day of Defeat, Team Fortress, and Counter-Strike, are not working well if the player does not have the original game which leads to positive sales numbers for the game development company. (Arakji & Lang 2007)

2.3.3 Testers

Tester communities consist of players who test games in different phases of their development process. Game companies use tester communities for beta testing in order to find errors, bugs or other problems in gameplay. Tester communities also give feedback to game developers on what features should be included and what excluded, and usually directly interact with the game development company or publisher. (Burger-Helmchen & Cohendet 2011)

User testing can also result in problems, which is what happened with Fury, a game developed by Aura and released in December 2007. With Fury, testers did not hunt bugs, but gave a lot of robust and critical feedback about features that needed to be updated and fixed. The game developers made significant changes and updates to the core design near the release date based on lobbying done by the testers. The game took three years to develop and cost 15 million dollars. The game ended up being a commercial failure and the general sentiment shared by users was that the game was bad. According to Aura's CEO, Tony Hilliam, the negative online conversations were the game's ultimate killer. The company had difficulty managing the relationship between the professional game developer team and user-testers. (Banks & Potts 2010)

2.3.4 Developers

Burger-Helmchen & Cohendet (2011) describe a developer community as modifiers, who develop a whole game or a specific element of the game. They differ from content builders that create supporting content to the original game. Arakji & Lang (2007) talk about total conversion modifications, which create entirely new games. They can consist of modifications of original maps and media files, and contain new game features. Even the theme might be completely different from the original game. Some modifications in this category have become more popular than the game they are originally based on. (Arakji & Lang 2007) Modifications can range from programming, digital artwork, and 3D modeling to music, voice-overs, and story writing (Hong & Chen 2013).

Modifications made by the developers have outstanding quality and game developer companies may even want to release them as new stand-alone games. In that process, the game developer is able to outsource market research, innovation and product development to the consumer. For example, Half-Life's modification Counter-Strike was later released as stand-alone retail product for PC, PlayStation, and other hardware platforms. (Arakji & Lang 2007)

Players who modify games provide free labor for the games industry (Beggs 2012). Modifications can bring huge benefits for the developer. Beggs (2012) estimates that the 2 million Skyrim mods are a result of 2 billion work hours which is worth of 45 billion dollars if an average game designer earns 45 000 dollars per year. The two million modifications were uploaded to Skyrim Workshop during the first week of sales, and Skyrim was the best-selling game of 2011, even though it was released in November. Modifications can have a big impact on the success of a game when they provide content beyond that which the developer could financially do themselves. However, according to Beggs (2012), developers are not economic victims of the game companies, because their impact is greater upon game consumers than it is on game companies.

2.4 Motivations for joining game communities

2.4.1 Player motivations

Previous studies have found reasons why people want to join online game communities. Hsu & Lu (2007) study showed that people participate in online game communities for entertainment, to kill time, to release pressure and for relationships (Hsu & Lu 2007). Postigo (2007) identified key motivations for making modifications as being increasing game enjoyment, artistic venture, being creative and the possibility of getting a job in the industry. Sotamaa (2010) suggests that there are also other motivations for making

modifications, such as cooperation, self-expression, research and hacking. Gidhagen et al (2011) state that development of modifications is based on players' enthusiasm and dedication to playing games.

Wirtz et al. (2013) state that consumers get positive experiences by engaging with a community. The members of a community are interested in helping others, want to participate in joint activities, and enhance the value of the community both for themselves as well as for others. (Wirtz et al. 2013) According to Laroche et al. (2012), people fulfill their need for belonging on social media. Game communities offer a social media platform for people to fulfill the need for recognition from community members that share the same norms, values and interests. (Laroche et al. 2012) Brodie's (2013) literature study found eight factors that explain consumer contributions to online communities: unleashing negative feelings, advice-seeking, expressing worry for other customers, self-enhancement, receiving advice or platform assistance, gaining social or economic benefits, and helping the company.

Consumers want to interact and cooperate with other community members, live up to a brand's symbolic function and to get social benefits. A functional driver for taking part in communities is the information-based support that can be received from other community members. Communities provide insights on what products are the best ones and why, potential causes of problems, viable solutions, and general tips on product usage. (Wirtz et al. 2013)

For games, these can be gameplay tips, information about modifications and instructions for solving technical problems. Active communities that provide quality information can also help with the discomfort of making a purchase decision. (Wirtz et al. 2013) Other consumers influence a player's decisions and the value the player obtains from the product. It happens through word of mouth communications or observational learning, and can influence the player. (Marchand & Hennig-Thurau 2013; Wirtz et al 2013)

Skilled and creative players have a motivation to create modifications for games that allow for and encourage other modifications. (Beggs 2012) Modifications can increase the number of players and boost long tail sales. On Portal 2, the number of players increased more than 20 times after the release of a mod toolkit, and ARMA 2 sold 300 000 copies in just seven weeks three years after its release because a popular mod was released. (Hong & Chen 2013) However, even if modifications are celebrated by game developers, they are not always profitable from the industry perspective because of intellectual property violations and the possible competition arising between free mods and official expansions made by the game developer. (Hong & Chen 2013) Sotamaa (2010) found four key motivators players had for creating modifications, which are represented in table 1.

Table 1. *Key motivators for making modifications for games (Modified Sotamaa 2010)*

Playing	After enjoying the game the will to try out to develop own ideas to the game.
Hacking	Interest of figuring out how the things work and how to implement the ideas to the game.
Researching	Gathering information
Artistic expression	Experience of creation
Cooperation	Creating modifications with other team members working toward a shared goal.

Table 2 presents the reasons for participating in online game communities according to Hsu & Lu (2007). Entertainment is the foremost reason, claimed by 77% of survey respondents. Other reasons include killing time (72%), releasing life pressures (48%), interest (46%) and relationship (41c%).

Table 2. *Reasons for participating in online game communities (Hsu & Lu 2007)*

Reason for participating in an online game community		
Items	No. of respondents	Percent
Entertainment	277	77
Kill time	259	72
Release life pressure	174	48
Interest	167	46
Relationship	147	41

Table 3 lists the problems faced by participants in online game communities according to Hsu & Lu (2007). Problems are either technical, such as a sudden disconnection from the system, network congestion, or inefficient connection to the system. Others include negative behavior from other community members, such as facing too many grief players or encountering otherwise malicious players. Negative behavior in a game community can be harassing other players, using for example racist, sexist, or homophobic language or telling other players to go kill themselves.

Table 3.   *Problems faced by participating in online game community (Hsu & Lu 2007)*

Problems faced by participants in online game communities		
Items	No. of respondents	Percent
A sudden disconnection from the system	246	69
Encountering malicious players	239	67
Too many grief players	212	59
Network congestion	195	54
Inefficient connection to the system	169	47

Companies wanting to harness communities need to find ways to overcome these issues to keep the community happy, growing and productive. Negative community can drive away the users from knowledge sharing.

2.4.2 Company motives

Companies have many motives to take part to communities. Table 4 shows the motives for companies to engage on social media which is one way to communicate with the user communities as they can be a strategic asset for a company (Hau & Kim 2011). The key driver for companies is to enable the formation of online consumer communities. The downside is that social media offers a platform for bad word of mouth, which can affect the company's image. This has forced companies to create strict social media monitoring systems and guidelines for managing such behavior. (Piller et al 2011) Wirtz et al. (2013) notify that when a product is complex, consumers feel that information provided by the community is more valuable in making the purchase decision than information provided by the company.

Negative information is found to be more effective than positive information, but on online brand communities it has been noticed that positive information has a stronger effect. Positive information provides the desired confirmation that the product is indeed suitable for the buyer. (Wirtz et al. 2013) However, Brodie (2013) states that consumers are searching for negative word of mouth content online when they are lacking information and experience, and it has been noticed to affect book sales. (Brodie 2013)

Table 4.   *Company motives for engaging on social media (Piller et al. 2011)*

Activity	Motive of usage
Marketing (advertising, PR)	Drive traffic, viral marketing, customer loyalty, customer retention
Sales	Increase revenue
Customer Service/Support	Cost savings, revenue, customer satisfaction
Product development	Increase fit to market, cost savings

Some companies utilize modification communities in seeking the next generation of employees, while others benefit from communities by getting more content for the game, which in turn leads to increased sales and customer satisfaction. (Beggs 2012; Hong & Chen 2013) Developer modding communities also fix bugs and add patches. For example, the Skyrim modding community made a completely new user interface for the game (Hong & Chen 2013).

Figure 6 presents the factors influencing video game purchase decisions found by a study done on USA video game players. Word of mouth influences 11% of gamers' buying decision. Other criteria are quality of graphics (12%), interesting story (16%), price (21%), product familiarity based on past experiences (9%) and product being a continuation of a favorite game series (9%). (ESA 2016)
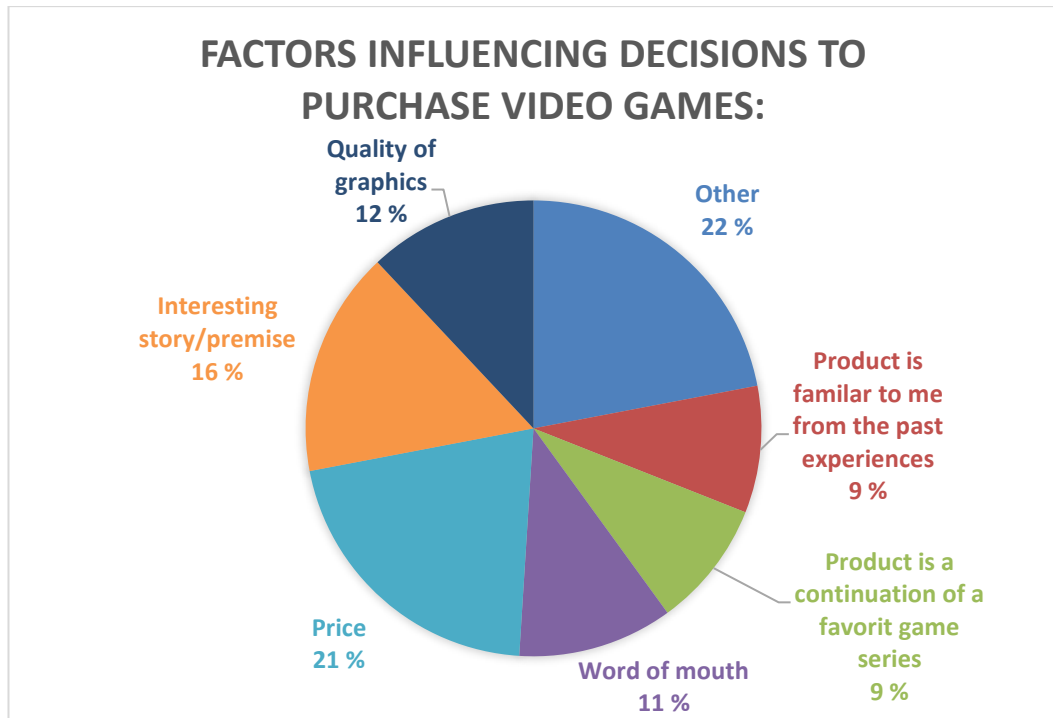
FACTORS INFLUENCING DECISIONS TO PURCHASE VIDEO GAMES:

Quality of graphics
12 %

Other
22 %

Interesting story/premise
16 %

Product is familar to me from the past experiences
9 %

Product is a continuation of a favorit game series
9 %

Price
21 %

Word of mouth
11 %

Figure 6.   *Factors influencing decisions to purchase video games (ESA 2016)*

Long term brand members will adopt a new product from the preferred brand faster and with more likelihood than short-term members, who are conversely more likely to adopt a product from a competing brand. (Laroche 2012; Wirtz et al. 2013) The long-term customers and community members of a game developer or publisher are a vital resource, as they buy the new games, share their knowledge, and spread information via word of mouth to other possible customers. User innovations enable the companies to extract ideas with which they can improve their games in a cost-effective way, something that cannot be imitated by their competitors easily. (Hau & Kim 2011)

Communication between the company and the community reveals the voice of the loyal customers. At first the opinions and experiences were only used as a source of market research, but they can also provide valuable insights into the strengths and weaknesses of a products. Communities can help developers understand trends, customer needs, and the desirable features of products. Communities can also help game developers reach an agreement with marketing departments, because online communities provide both a shared platform that shows consumer demands. (Wirtz et al 2013)

Communities offer companies new ideas and paths to the market, which can be used in the same way as internal ideas and paths. Companies that manage to harness their communities can get a competitive advantage. Users can be considered experts in the games they play, so the relationship with users may well be a key factor in a game company's success. (Burger-Helmchen & Cohendet 2011) Communities can also act as a customer support platform where players help each other solve problems. It's useful for

a game developer to devote resources to answering the questions that interest a large part of the community. (Gidhagen 2011)

Gaming communities enable open innovation for game companies. The term open innovation characterizes an innovation process that takes place in co-operation with external actors, not just inside the company. Customer co-creation is a term used to describe a development process where customers are actively involved and take part in the process. The methods companies can use for customer co-creation include ideation contests, workshops, user opinion platforms, toolkits for user innovation and co-creation, and communities. (Piller et al. 2011)

2.5   Community management in gaming communities

In the video games industry, an important part of product value is created by communities that are not directly controlled by developers. (Burger-Helmchen & Cohendet 2011) To benefit from the content created by its customers, the company needs to develop dedicated processes for managing social media and communities. (Piller et al. 2011) Engaging customers in the ideation process of a new game is a strategic move that encourages communities to act as collaborative partners. (Chan et al 2015) Customers are driven to participate in co-creation by extrinsic benefits like money, recognition or reputation or intrinsic benefits like social status and task fulfillment. (Piller et al 2011)

Many game developers have Community Managers, whose job is to monitor the activities taking place within the community and its sub-forums. For example, Blizzard Entertainment has hundreds of Community Managers working worldwide. Community Managers represent the game developer within the community and interact with the players who share their thoughts, requirements, and comments on the game's content. By representing feature modifications or entire mods to the Community Manager, players can actively contribute in game development. Community Managers interact with users and the development team, gathering and sharing information regarding the way players react to what the game developer does. (Gidhagen et al 2011)

For a community member, participating in an online game community is entertainment. Therefore, a developer taking care of a community should motivate the community members with enjoyment, fun, curiosity, exploratory behaviors, and flow experience (Hsu & Lu 2007; Hau & Kim 2011). In a working community, there is trust between members. Hsu et al. (2007) use Mayer et al.'s (1995) definition of trust, which states that trust is "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party". (Hsu & Lu 2007) Laroche et al. (2012) suggest that by enhancing relationships between the community members and the company, trust also grows towards the brand. Information sharing reduces uncertainty about the brand. (Laroche et al. 2012)

Intrinsic motivation is fulfilled if an activity gives immediate satisfaction but does not have monetary value, unlike extrinsically motivated actions that are rewarded by events, prizes, or money. Game developers should understand the motivations behind the communities before making managerial decisions. There no universal tool for harnessing all types of communities, instead the mechanics and platforms need to be adapted to fit each type of community. (Burger-Helmchen & Cohendet 2011)

Game developers should also create a strong relationship with a community's opinion leaders, because they can affect other users' participation. (Hsu & Lu 2007) Hsu & Lu 2007 suggest that a periodic party or contest could increase users' cohesive perception. Hau & Kim (2011) warn about launching user community promotions that deal with money, gifts, or other material rewards. Their research shows that rewards can have a negative effect on innovation-conducive knowledge sharing. They suggest motivating knowledge sharing within a game community with fun, pride, and enjoyment. The community should be nurtured by the developer with a common goal and vision of knowledge sharing in mind to create social trust and positive attitudes. (Hau & Kim 2011) Garnefeld et al. (2012) also point out that monetary rewards increase short term activity, but tend to decrease long-term participation in the community. This happens only to active members of the community, as monetary rewards do not affect the already passive members because they are not looking for it from the community. (Garnefeld et al. 2012) Hau & Kim (2011) state that extrinsic motivations like compliments, reputation, promoted status in the community, and material rewards can decrease the willingness to share knowledge in a community. Some companies reward their active community members by making them moderators on the game developer's official community platform. Players accept this job mainly because it raises their status higher within the community. (Gidhagen 2011)

If a community is thought of as a part of the internal resources of a company, it should be rewarded in a similar manner to employees, which means relying on extrinsic motivation mechanics. With communities, it is important to understand the dynamics between the extrinsic and intrinsic motivations to see what measures influence the intensity and quality of knowledge and modifications produced by the community. External rewards have two effects, they bring about a feeling of control, and provide information on one's perceived competences, which leads to the intrinsic motivation being reduced or raised. (Burger-Helmchen & Cohendet 2011)

Explicit normative incentives, such as a common goal, are better at keeping the community active and committed. They increase active community members' interest for participation in the short-term, and do not affect their long-term participation. However, this has no effect on passive community members either short-term or long-term. (Garnefeld et al. 2012) If the game system is friendly, easy to use and accessible, people will participate more in an online gaming community (Hsu & Lu 2007).

According to Chan (2015), frequent feedback from the game developer to the community motivates and enhances new idea creation by players. Posting ideas costs customers resources, and they need to get benefits, such as feedback and interaction with their peers. Ideas require physical and psychological effort to form and share as well as time spent on the community platform. From voluntary online participation, players get benefits such as a better understanding of the game, closer relational ties to other players or game developers, gains in reputation or status and interesting, mentally stimulating experiences. When players receive frequent feedback, they become more inspired, want to learn and focus more on idea generation. (Chan et al 2015)

Players' past experiences from online communities affect their willingness to participate in the community. (Chan et al 2015) Bad experiences, such as unstable systems, malicious players and grief players, can affect community member interest negatively. According to a study by Hsu & Lu (2007), the most important problem for online communities is disconnections from the system, while the second main problem is malicious players. The third problem is grief players, who are impolite and unethical. The community needs to have ways of overcoming these kinds of problems. (Hsu & Lu 2007) A user friendly website system is a key factor in driving positive attitudes and communication (Hsiu-Fen & Lin 2006). Online game communities are entertainment for their members, so perceived enjoyment is an important reason for the user to return and contribute to the community. (Hsu & Lu 2007) Receiving a high number of comments from several people is not always the best case, because it might reduce the chances of finding the social support or useful information that the consumer was after. The community platform should have good information search methods and easy to use archives to downplay the effect of irrelevant comments. (Chan et al 2015)

Managing a community requires resources. The company needs to have an organization-wide commitment and willingness to work with the community even though it's not a corporate asset and cannot be fully controlled by the game developer. Community managers should support the community and offer it both structure and flexibility. They should focus on nurturing the quality of information shared in the community, which is more challenging on online communities than it is in an offline environment. (Wirtz et al. 2013) The interactive dialogues between game developers and player communities can trigger new ideas that neither the community members nor the game developers were able to generate alone. Customers can feel closer to the community if the company is a part of the community rather than the manager of it. (Chan et al. 2015)

Game developers and publishers can benefit from modifications (Sotamaa 2010) and user knowledge conducive to innovation (Hau & Kim 2011), if the users share their creations and ideas voluntarily. Sotamaa (2010) interviewed a modification developer who said he is considering partially commercializing his work. In autumn 2016, the Swedish game publisher Paradox Interactive released two DLCs made by Cities: Skylines modders (Paradox Interactive 2016). Modification makers are not usually expecting monetary

gains, but are rather making modifications to build a part of their curriculum vitae (Gidhagen et al 2011), and in the case of Paradox Interactive it paid off for the modders. According to Piller et al. (2011), social media platforms encourage modification developers to share their creations easily and allow them to get feedback from other users. Steam has its own social media modification sharing platform called Workshop, which can be integrated into games published on the platform (Valve).

Utilizing communities also comes with some risks, and the scale of risk depends on whether the nature of the relationship is a network of consumers or an outsourcing partnership. Sharing information and copyrighted content with the whole online community carries with it more risks than sharing the content with a few partners working under agreements. Game developers can take some measures to protect the core technology from the community by offering development tools while keeping the game engine separate from the public content files. Even with these actions, the ideas and methods of the game are vulnerable, and modders might transfer their gained knowledge to competitors. The game developers who do not allow modding have also been able to remain successful in the market while collaborating only with trusted partners under strict confidentiality agreements. (Arakji & Lang 2007)

There is also the concern of competitors posing as modders to access the game code. In the case of Half-Life, the original game was required in order to use the extremely popular modification, Counter-Strike, so it had a positive effect on sales. The risk is that modifications move away from being complimentary to the product and into base products of their own, which is what happened to Blizzard when players of the MMOG World of Warcraft set up their own private servers instead of using the game developer's fee-based servers. (Arakji & Lang 2007)

Online communities can easily gather a lot of negative feedback and discussion. The discussions can be dominated by a few members and even be unrelated to the product, but still result in negative brand image. Managing this is difficult, because community members need to feel free to express their opinions. (Wirtz et al 2013) There is also the risk of modders creating content for the game that conflicts with the values of the game developer, which leads to value loss for the original game. In order to reduce the risks related to sharing game content with the community and allowing players to make modifications, many companies include cease-and-desist clauses in their end-user license agreements. (Arakji & Lang 2007)

Game developers need to manage their relationships with different types of communities, such as testers and developers. Each type of community requires a specific way of community management in order to utilize the potential of the community by accessing, aligning, and assimilating the production done by it. (Burger-Helmchen & Cohendet 2011) Chan et al. (2015) studied how customers' online interactions with companies or other community members affected their likelihood of generating new ideas. The

members of a community feel more united and closer to each other if they establish shared feelings of consciousness, rituals, and traditions (Laroche et. al 2012). They propose that frequency at which the company gives feedback affects customers' likelihood of posting ideas in three ways. A company that provides feedback and information related to their latest product development offers the community members social benefits and a sense of partnership. The feedback also guides the way community members contribute valuable ideas and therefore enhances their expertise and helps the community understand the goal of the company. Feedback provided by the company also results in a stronger sense of consumer ownership over the innovation process and drives the customers to contribute ideas. Feedback also motivates the customers to post ideas, because it shows the ideas are recognized and valued by the company. (Chan et al. 2015)

Online community managers should clearly define their values and vision so users can adopt these group norms into use when interacting with each other. Community managers can enhance the system and information quality, and organize offline activities. The role of social influence is important, an individual user's behavior as a member may be influenced by the community. (Zhou 2011) Burger-Helmchen & Cohendet (2011) reviewed different studies related to harnessing communities, presented in table 5.

Table 5.   *Studies on harnessing communities (Burger-Helmchen & Cohendet 2011)*

Authors	Case setting - industry studied	Nature of the community	Action of the community	Tools used to harness the community
Käser and Miles	Inside multinational consumer	Different groups with different knowledge	Helps identifying knowledge gaps and potential threats to the company	Workshop, face to face meeting
Jeppesen and Frederiksen (2006)	Computer controlled music instruments	Hobbyist and professional users	Helps developing the product	Web interfaces, recognition by the company of the work done
Dahlander and Magnusson (2008)	Firms involved in open source software	Different groups with different knowledge	Develops, tests and shares resource codes	Web interfaces
Harrison and Waluszewski (2008)	Bio sensor products	Different sub groups	Re-launches a product	Web interfaces and user-to-user interaction
Millet et al. (2009)	None, theoretical work	Different degrees of variety in the group	Promotes the product of the firm	Marketing efforts
Fredberg (2009)	Reality TV show Big Brother	One group	Guides the development of the show	Different channels (web, newspaper, TV, chat)
Jäger et al. (2010)	A machinima company	One group	Provides comments and specialized feedback to improve the product	Social software

Companies should use social software which enables the community members to give feedback. Good feedback mechanics enable word-of-mouth networks and build trust. Communities that start as loose networks can form into tight communities. Game developers can help this along with social software (Burger-Helmchen & Cohendet 2011). The platform does not need to be too sophisticated and expensive, but it should be easy to use (Burger-Helmchen & Cohendet 2011) and work without disturbances (Hsu & Lu 2007).

2.6   Game analytics

Game developers are not only using direct communications with communities to monitor how players react to changes in the game. Game analytics is a new concept brought into

game development from Business Analytics. The focus is to gain insights into user behavior by analyzing the player and their gameplay sessions. (Niwinski & Randall 2010) Some companies are utilizing data analysis by tracking gamers' activity through monitoring technology. (Gidhagen et al 2011) The objective of analytics is to find patterns in data and utilize them to solve business problems or improve performance. Analytics is performed by methods such as statistics, data mining, mathematics, programming, and operations research. (Drachen et al. pp. 14)

With the help of game analytics, game session can be designed to have clear goals and give immediate feedback to help the player. The players need to feel that the game can be mastered while not being challenging enough. By analyzing the game play sessions, the game development team can see the places where gameplay needs to be more challenging and where players need a little bit of help. Most important points to fix are the moments where the players decide to not continue playing the game. (Hicks et al. 2016)

3. RESEARCH METHODS

3.1 Research approach and methods

This thesis uses quantitative research. The empirical part was done by creating a survey for PC gamers and professional PC game developers. The survey was mainly used for quantitative research, to collect statistics about opinions of game community members. The survey results and the theory collected from literature are considered together. The aim was to find connections between them, which would lead to answers to the research questions. Theory was based on literature found using Google Scholar, and works were selected based on their availability with the student license of Tampere University of Technology as well as their relevance to this study.

3.2 Survey

Research was conducted by survey method. For the research, survey was selected as the means of gathering data as it could be analyzed quantitatively and showed potential of providing more information than interviews would have. Furthermore, interviews would have required more of the researcher's time. The survey was done as an online survey that anyone could answer, a fact that needed to be remembered when analyzing the results, because the researcher could not be sure that respondents represented a random pool of people.

The survey was done online and got 1525 responses from 6 different continents. Main areas were Europe with 60% of respondents and North America with 31%. The results were analyzed using quantitative research. In this study, the researcher was not in any kind of contact with the participants during the time they were answering the survey questions. Furthermore, the participants were not supervised in any way while answering, they simply had an online link to follow to reach the questions. (Hirsjärvi et al 1997 pp. 188-189)

Survey as a research method saves the researcher's time and reaches a higher number of participants than interviews would. The downside of the survey method is that we cannot be know how seriously people have taken the survey, i.e. have they been honest and concentrated when answering. It is also hard to tell whether the answer options for the questions are good/valid or not. It might even be that people answering do not have actual knowledge about the subject to begin with (Hirsjärvi et al 1997 pp. 190). Attempts to take these issues into account and avoid them were made by only sharing the link in communities where people could reasonably be expected to have knowledge of the topic based on the fact they were members of said communities. A good survey research needs

good questions, and sometimes a survey does not get enough answers. (Hirsjärvi et al 1997 pp. 190)

A survey can collect information about facts, behavior and actions, knowledge, values, attitudes, beliefs, and opinions. (Hirsjärvi et al 1997 192) In this survey, the focus was to collect knowledge about attitudes, beliefs, and opinions of game community members. The survey used only one open question, and mainly relied on multiple choice questions, although they were provided with an open text field in case a respondent wished to point out an important matter that had been forgotten or overlooked when the questions were formulated. The open questions had to be analyzed using a qualitative method. (Hirsjärvi et al 1997 pp. 196-198) The survey questions were piloted using a few people working in the games industry in order to see if the terms within were understandable and correctly used. The survey used the basic template and background used by Tampere University of Technology surveys on the Webropol online survey tool. Analysis of the data was done using Microsoft Excel and IBM SPSS Statistics Data editor.

4. SURVEY RESULTS

4.1 Survey respondents

The survey received 1525 answers. In addition, it was opened 2060 times without sending an answer. The survey was open from 8th of July to 9th of August 2016 as that timeframe fit the study schedule best. The length of time was chosen with the assumption that the professional game developers who were on holiday either in July or August would be more interested in answering while at work. In order to attract game industry professionals to answer, a link to the survey was shared on community platforms such as Play Finland's Facebook page and on the researcher's own Facebook page, where the post got 28 shares.

The survey did not get as many answers from industry professionals as was hoped for, but a high number of players answered, which provided good data for the study. Players were reach by sharing the link on Paradox Forums in a thread called CO word of the week #16, which had reached 35 874 views on 9 August 2016, when the survey closed. On the social media platform Reddit's subreddit PCgames, the link got up voted and stayed on the subreddit's front page for the opening day of the survey. The subreddit had over 200 000 subscribers on 8 July 2016. The aim of using both Reddit and Paradox forums was to reach the active PC game community contributors, as the survey was meant for PC gamers, and the nature of mobile game communities can be argued to vary a bit from PC games. Paradox Interactive has active developer communities, which may have influenced the number of developers answering the survey and for the positive opinion shown towards game modifications.

The survey got 1525 answers from PC gamers and developers. 60% of the answers came from Europe and 31% from North America. The countries with most answers were USA with 388 responses and Finland with 298. Using Reddit as a platform to share the survey enabled people from all over the world to take part in the study. The remaining 9% of the answers came from Australia and Oceania, Asia, and Africa. The number of respondents per country can be found in appendix B. Figure 7 shows the respondents split by continent.
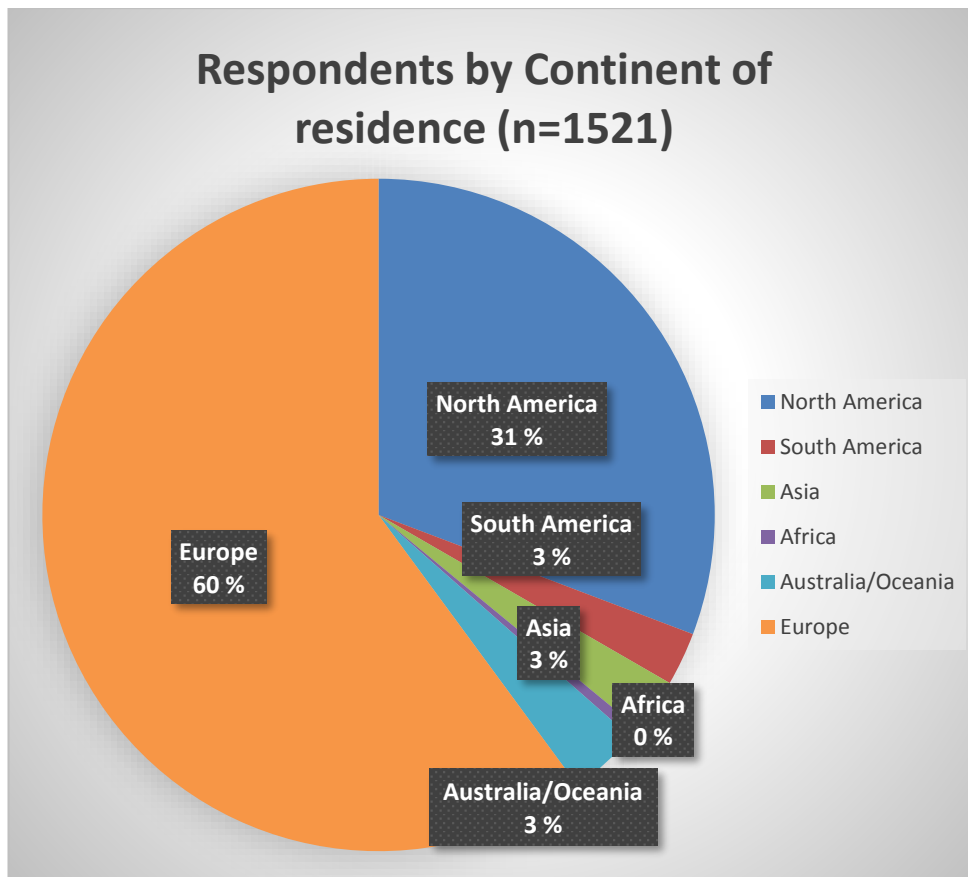
Figure 7. *The continent of residence of the respondents*

Table 6 shows the division by age in different respondent groups. In all groups, the 18 to 34 year olds were the biggest respondent group. This was as expected, since the survey was shared on platforms where this particular age group makes up most of the users. The background questions where mainly planned to work as warm up questions for the respondents and to find out how big the variety was between survey respondents.

Table 6. *Age division of the respondent groups.*

Age	Average users	Players	Testers	Developers	Professional Game developers
<18	52	62	11	14	2
18-34	495	386	109	131	50
35-50	81	39	26	20	9
51-69	13	7	3	5	0
>69	1	0	1	0	0
	n=642	n=494	n=150	n=170	n=61

The gender division of the survey on the other hand was stronger than expected, as according to Beggs (2012), players in the USA are divided almost evenly into males and

females, so we should not assume males play more games than females. 98% of the survey respondents were male, which does not however allow for conclusions other than that maybe the survey simply reached more males than females. It may be that there were more male users on the Paradox forum and Reddit's PCgaming subreddit, which led to the uneven balance between the genders of respondents. Had the survey been shared to a randomized group of people, it would be a more reliable source for analyzing if there is some gender division existing or not.

Based on the questions asking how the respondent takes part in gaming communities, the respondents were divided into average users, players, testers, developers and professional game developers. Average users are the group who follow gaming communities, but don't create content for them. Players create content like gameplay videos and tutorials, and take part in communities to share and receive knowledge. The tester group was formed by respondents who told they test games and share feedback with professional game developers. Developers are the group of respondents who create modifications for games, and professional game developers are those who answered they are professional PC game developers.

4.2 Importance and roles of game communities and game analytics for professional game developers

The survey was divided into two parts: questions 6-12 were directed only to professional PC game developers while questions 1-5 and 13-24 were to everybody. PC game developers were represented by 62 respondents, one of whom was ruled out due to answers not given seriously. 39% of the respondents are programmers, 18% management and 15% game designers. Quality assurance and game testers, artists, and community managers each represent an 8% slice. One data analysist and one marketing person answered the survey, each making up 2% of the respondents. The division of job titles between the respondents is shown in figure 8. The survey got answers from all fields of game development, which can make the overall results more reliable compared to getting answers only from one department of game development companies.
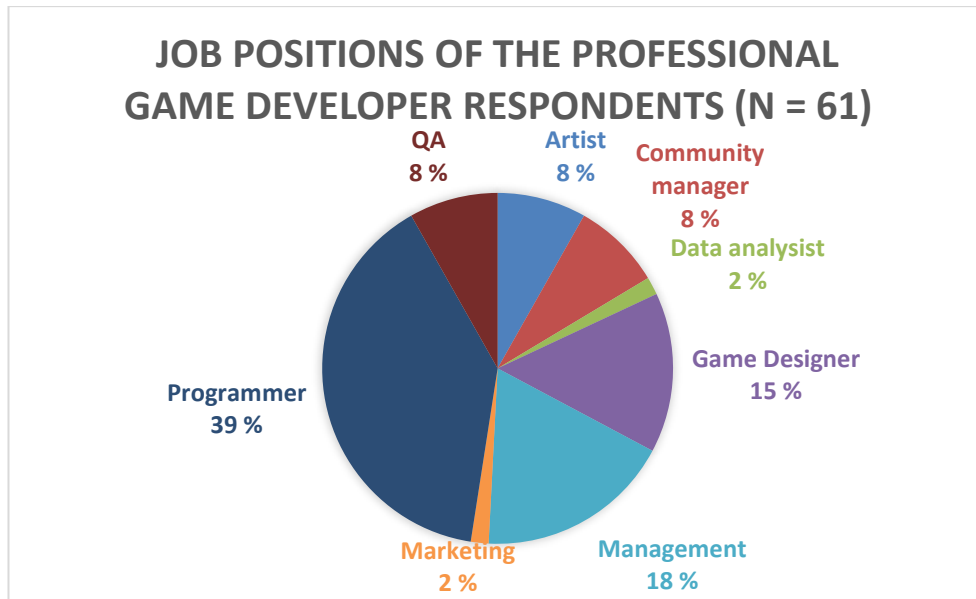
Figure 8.   *Job positions of professional game developer respondents*

Most of the respondents think that game analytics and game communities are important or very important for game development. Only 6 respondents stated that game analytics is not at all important or not important and 4 respondents find game communities not at all important or not important. 44% of the respondents find game communities very important to game development. The answers regarding the importance of game analytics and game communities for game development is presented in figure 9.

Figure 9.   *Importance of game analytics and game communities for game development*

In addition to asking game industry professionals how they themselves feel about utilizing game analytics and game communities in game development, the same question was

asked regarding the companies they work for. 48% of the respondents see their company valuing game analytics as important or very important for game development. 30% of the respondent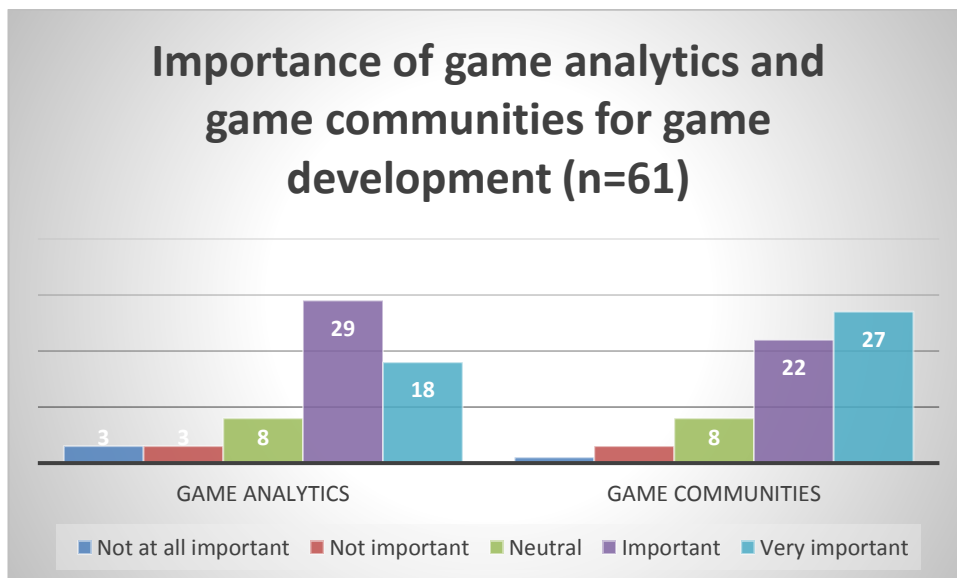s stated the opinion to be neutral, and 23% of the respondents say their companies think game analytics are not important or not at all important. 69% of the respondents say their companies see game communities as being important or very important for game development. 11% of the respondents say game communities are not at all important or not important for their companies. 20% of the respondents say their companies are neutral about the importance of game communities. The responses are presented in the figure 10.
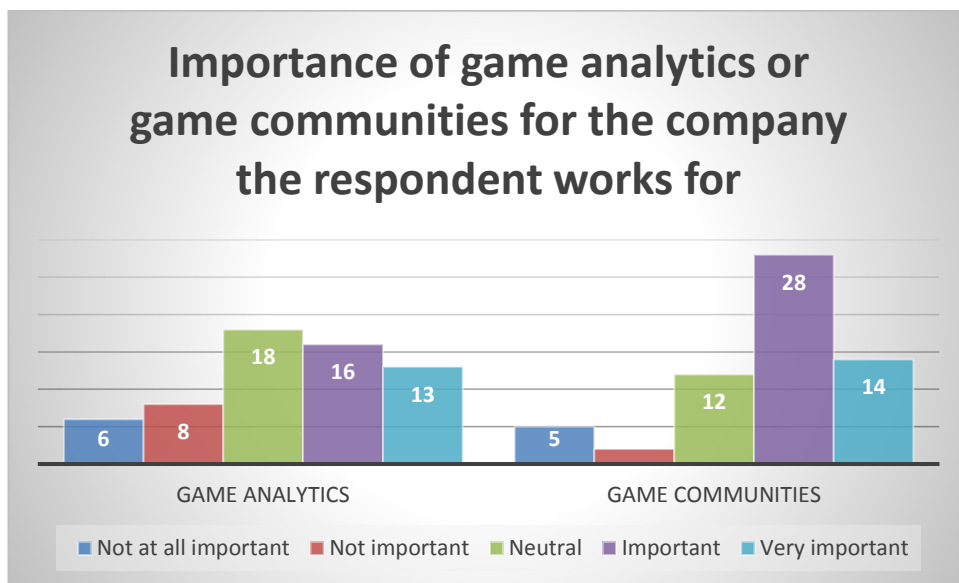
Figure 10. *Importance of game analytics and game communities to game development from the game company's point of view*

Industry professionals were asked which phases of game development game analytics or game communities could be utilized in. The phases are pre-production, which includes concept creation and design processes. Alpha, beta and gold phases belong to the production phase and post-production refers to updates and expansions or creation of downloadable content. Four respondents stated that game analytics are not useful in any development phase and two feel the same way about game communities.

Game analytics and game communities show a similar trend in the answers. 39% of the responses say that game communities can be utilized in the concept creation phase and 37% think the same about game analytics. For the design phase, game analytics got approval from 59% of the respondents, while game communities were seen useful by 39% of the respondents. Figure 11 shows what development phases game analytics could be used in.

Use of game analytics or game communities in different game development phases (n = 61)
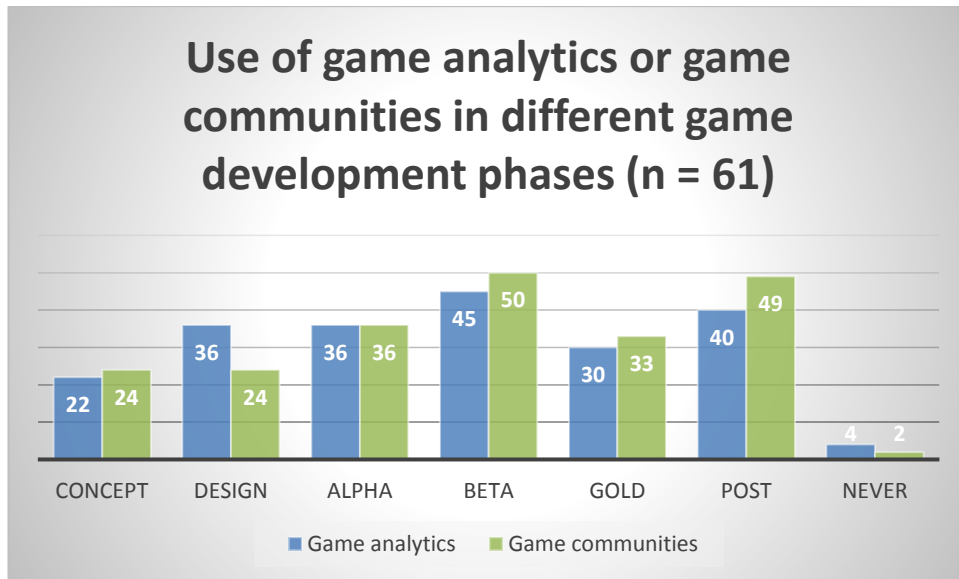
Figure 11. *Use of game analytics and game communities in different game development phases.*

Game communities and game analytics were stated to be useful in the production phase by 59% of the respondents. 74% of the respondents see game analytics as being convenient in the beta phase, and 82% see game communities useful in the same phase. 54% find game communities and 49% game analytics to be useful in the gold phase. 66% of the respondents think game analytics are useful in the post-production phase, and 80% think game communities are useful in post-release development.

Analytics and game community utilization are seen to be most useful in the beta phase. In this phase, the community provides testers whose gameplay sessions can be analyzed, which helps catching bugs that stop the player from moving forward in the game. This also provides information on where the game might need some more guidance or balancing. The community platform also offers the testers the possibility of sharing their ideas and reporting bugs.

5. GAMING COMMUNITIES AND COMMUNITY MANAGEMENT IN PC BASED GAME DEVELOPMENT COMPANIES

5.1 Roles of gaming communities in PC based video game companies

Game communities can have an impact on the decision to purchase a game. An active community is most important for testers and developers, which can be explained by their personal interest in being active members of communities. Professional game developers find it less important than other user groups; average users, players, testers and developers. Professional game developers might not be as interested in spending a lot of time with communities as players, who are doing it as a hobby. Average users don't attend communities, but for them it might still be important that there is an active community making tutorials and let's play videos for the game. In figure 12, the division between these groups is presented. The green bar is the neutral opinion, and purple and light blue are the important and very important bars. Red and dark blue mean not important and not at all important.
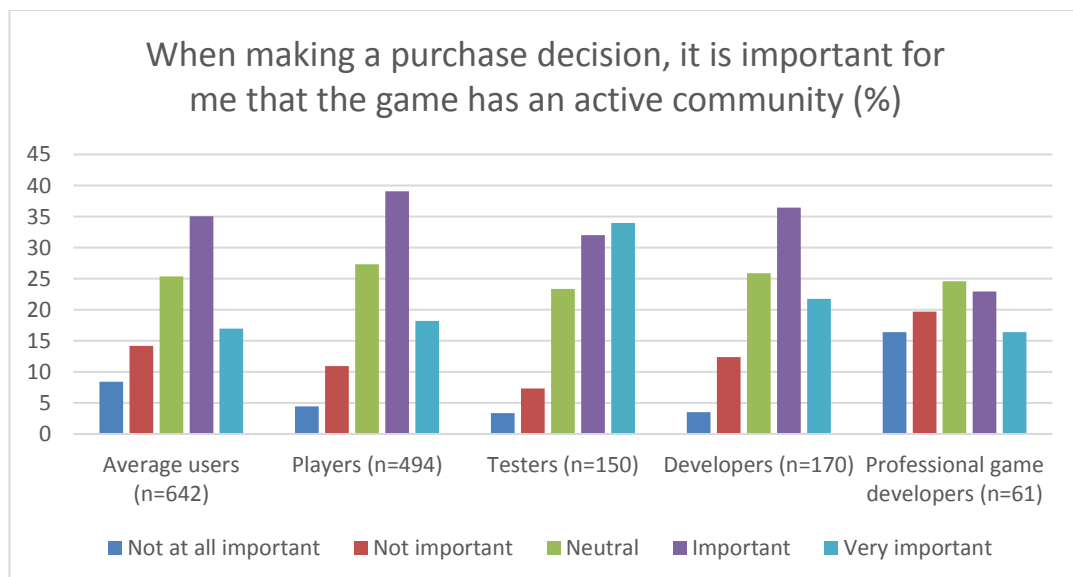

Figure 12. *How much the activity of a community affects the buying decision.*

For all user groups, the opinion of the community has a strong effect on the purchase decision. Only small minorities say it does not matter at all. A slightly larger number in the professional game developers group say community opinion does not affect them,

which might be because their motivations for buying a game might be different from other groups, such as investigating certain game play elements or graphical styles. The results are tested also with Chi-squared test $x^2(16)=54,32$, p=0,000 and the chi-squared test is shown in table 7.

Table 7. *Chi-squared test for how much community activity affects to purchase decision.*

Observed

	Average users	Players	Testers	Developers	Professional game developers	Total
Not at all important	54	22	5	6	10	97
Not important	91	54	11	21	12	189
Neutral	163	135	35	44	15	392
Important	225	193	48	62	14	542
Very important	109	90	51	37	10	297
Total	642	494	150	170	61	1517

Expected

	Average users	Players	Testers	Developers	Professional game developers	Total
Not at all important	41,1	31,6	9,6	10,9	3,9	97
Not important	80,0	61,5	18,7	21,2	7,6	189
Neutral	165,9	127,7	38,8	43,9	15,8	392
Important	229,4	176,5	53,6	60,7	21,8	542
Very important	125,7	96,7	29,4	33,3	11,9	297
Total	642	494	150	170	61	1517

X2 =	54,32
df =	16
p =	0,000

Cells have expected count less than 5.	4,0 %
Minimun expected count.	3,9

As the value of p is under <0,005 and under the 20% of the cells have the expected count less than 5 the result is valid. Community activity has an important affect to purchase decision with all the user groups is statistically significant and the expected results can be utilized. From the expected results compared to observed can be seen that for average users the importance of community activity is a bit stronger and for testers a bit less important. Tester community members might not be as dependent on other community members' contribution while the average users exploit the work of other groups.

Figure 13 shows how the affects and affects a lot are the most popular answers to the question in all the user groups. This indicates that game development companies should not overlook the power of communities. With this survey, the importance of communities might be higher than it is for players on average, as the survey was shared on gaming specific community platforms, but it does indicate that for active community members, community opinion affects the purchase decision. Also, according to Wirtz et al. (2013), community opinion can help with the uncertainty of whether or not to purchase, and Hau & Kim (2011) raised the issue of the importance of word of mouth, which community members can spread to other potential customers.
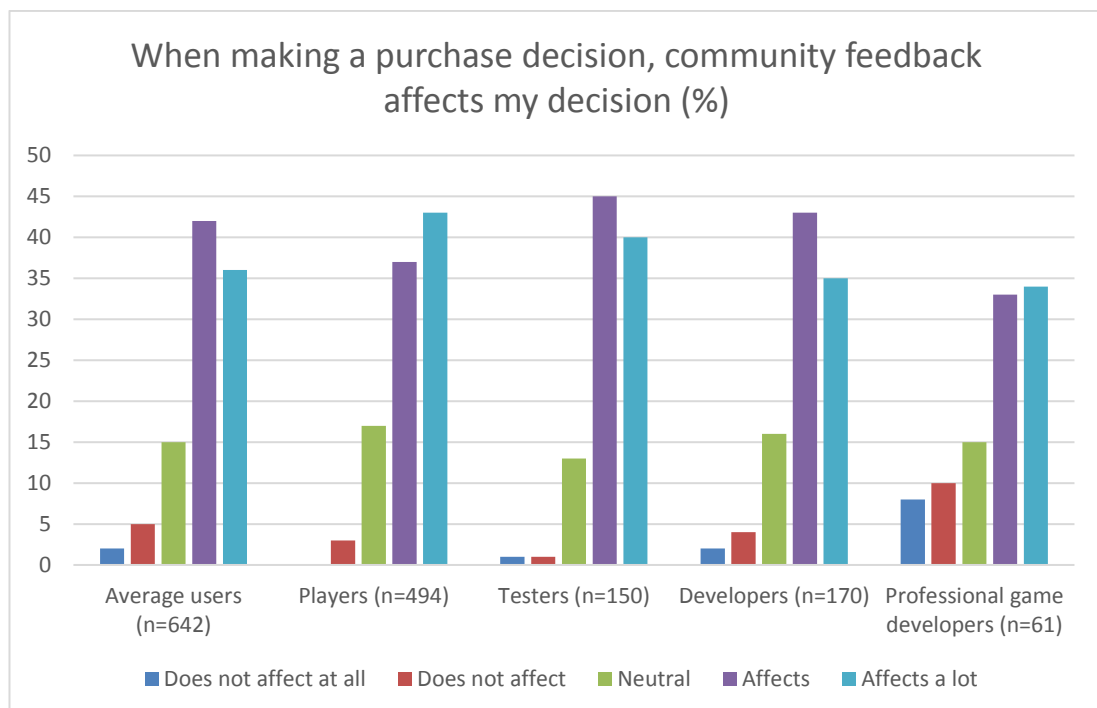
Figure 13.   Community feedback affects my purchase decision

The effects of community feedback is also tested with Chi-squared test x^2(16)=54,32, p=0,001 and the chi-squared test is shown in table 8. The expected and observed tables don't have big differences and test is valid since there are less than 20% of the cells having expected count less than 5. Value of p is under 0,005 so the result is statistically valid and the community feedback has a strong effect to purchase decision in all user groups.

Table 8. *Chi-squared test for how much community feedback affects to purchase decision.*

Observed

	Average users	Players	Testers	Developers	Professional game developers
Does not affect at all	14	2	2	4	5
Does not affect	30	17	2	6	6
Neutral	95	84	20	28	9
Affects	268	181	67	73	20
Affects a lot	235	210	59	59	21
Total	642	494	150	170	61

Expected

	Average users	Players	Testers	Developers	Professional game developers
Does not affect at all	11,4	8,8	2,7	3,0	1,1
Does not affect	25,8	19,9	6,0	6,8	2,5
Neutral	99,9	76,9	23,3	26,4	9,5
Affects	257,7	198,3	60,2	68,2	24,5
Affects a lot	247,2	190,2	57,7	65,4	23,5
Total	642	494	150	170	61

X2 =	**38,36**
df =	**16**
p =	**0,001**

Cells have expected count less than 5.	16,0 %
Minimun expected count.	1,1

Modifications are seen as nice additions to a game, but for many respondents they are not that important. The users in the developer group feel them to be very important, but this is understandable as they are the ones making the modifications in the first place. For other groups, the division between very important, not at all important and neutral is even. The response percentages are shown in figure 14.
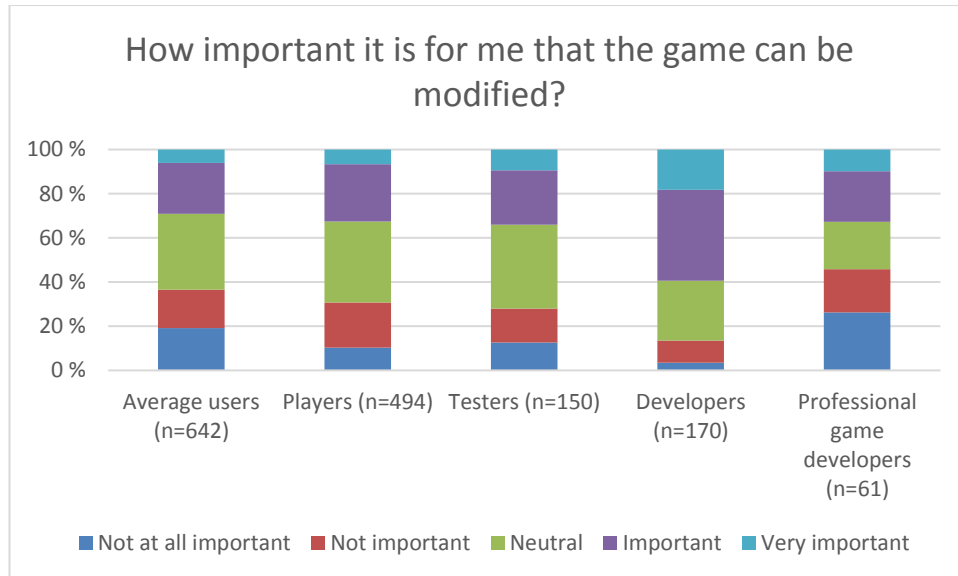

Figure 14. *How important is it that the game can be modified?*

Most users feel that a game supporting modification is a nice addition, which is shown by the survey question "how do you feel about modding?". Most of the respondents reported that modifications make games more interesting to play and are a nice addition, while a smaller number said modifications are altogether vital in order for games to be good. For developers, modification support was a bit more important than for other user groups, and 34% of the developers thought it vital for games.

The importance of games modability is checked with Chi-squared test $x^2(16)= 95,93$, p=0,000 and the chi-squared test is shown in table 9. The test is valid since there are less than 20% of the cells having expected count less than 5. Value of p is under 0,005 so the result is statistically valid. With importance of modability there is some differences with observed and expected tables. For all the groups expected results show that there are more users who don't see it so important and for example for developers it is not as crucial could be expected. The result could be explained by the variety of the games, for some games it is fun and important to have the chance to create and use custom made content while some games are enjoyable even if they could not be modified.

Table 9. *Chi-squared test how important is it that the game can be modified.*

Observed

	Average users	Players	Testers	Developers	Professional game developers
Not at all important	123	51	19	6	16
Not important	112	101	23	17	12
Neutral	220	181	57	46	13
Important	148	128	37	70	14
Very important	39	33	14	31	6
Total	642	494	150	170	61

Expected

	Average users	Players	Testers	Developers	Professional game developers
Not at all important	91,0	70,0	21,3	24,1	8,6
Not important	112,1	86,3	26,2	29,7	10,7
Neutral	218,8	168,4	51,1	57,9	20,8
Important	168,0	129,3	39,3	44,5	16,0
Very important	52,1	40,1	12,2	13,8	4,9
Total	642	494	150	170	61

X2 =	95,93
df =	16
p =	0,000

Cells have expected count less than 5.	4,0 %
Minimun expected count.	4,9

The same trend can be seen in table 10 where are the multiple-choice answers for how the respondent feels about modding. Modifications are seen as nice addition and smaller group see them as vital for a game to be good. However, there was only a small minority answering that they don't use modifications at all or thought that games don't need them to begin with. This can be explained by the platforms where the survey was shared as Reddit and Paradox forums are popular platforms to talk and present modifications.

Table 10. *How do you feel about modding?*

How do you feel about modding?	Average users	Play ers	Test ers	Develo pers	Professional game developers
Mods make games more interesting	526	420	131	165	49
Modding is a nice addition	500	412	128	138	54
Should be supported	442	380	119	149	42
Good way to show skills	204	208	80	90	40
Vital for games to be good	90	82	29	58	14
It breaks games	68	35	15	11	7
Games don't need modding	21	11	4	4	4
I don't have an opinion	19	14	2	0	1
I don't use mods	17	12	5	5	2
I want to experience the game as the developer intended	8	5	3	3	0
	n=642	n=494	n=150	n=170	n=61

An active modification community seems to be a positive addition to games. Open answers indicated that some users like to first play a game the way the game developer intended, and after finishing it or after playing for a long enough time, trying out different modifications was a way to keep the game interesting.

5.2   Roles of community management in gaming communities

As communities affect a game's purchase decision, it is ever more in the interests of game companies to have community managers working with the communities. The most important task for a community manager is to communicate with the community and report the community opinion back to the developers. Professional game developers also see customer support, community evolution and hosting community events as important tasks. For other user groups, customer support and community evolution also rose to be the most popular answers, but not as important as the communication between the community and the developer. All the tasks are listed in table 11.

Table 11.   *Tasks of a community manager*

Task of a community manager	Average users	Play ers	Test ers	Develo pers	Professional game developers
Communication between developers and the community	574	463	139	160	57
Customer support	307	267	75	86	38
Community evolution	249	212	84	82	43
Event hosting	159	155	51	55	33
Product education	168	147	48	57	14
Administration	136	124	48	43	16
Dispute moderation	110	122	49	47	20
Metrics and or research	149	100	37	49	25
Content creation	108	81	29	27	13
Game development	105	75	21	20	12
Brand evangelization	80	66	19	21	28
Recruitment	41	50	19	23	11
Internal rallying	31	39	14	14	10
Training	21	16	8	5	7
	n=642	n=494	n=150	n=170	n=61

Communication between the game developer and the gaming community was the most popular answer, and also rated highest on the open question "what makes a game community good". Active gaming community members want to hear details behind the design decisions, know about the limitations of the product and have a chance to co-develop the game by sharing ideas and giving feedback. This can also be seen in the answers to the question "how important it is that the game developer participates in the community", which all user groups rated as important or very important. The responses are presented in figure 15. For the developer group, it is very important that professional game developers participate in the communities. For developers, sharing feedback on how developer tools can be improved and getting insights that help making modifications can be vital.
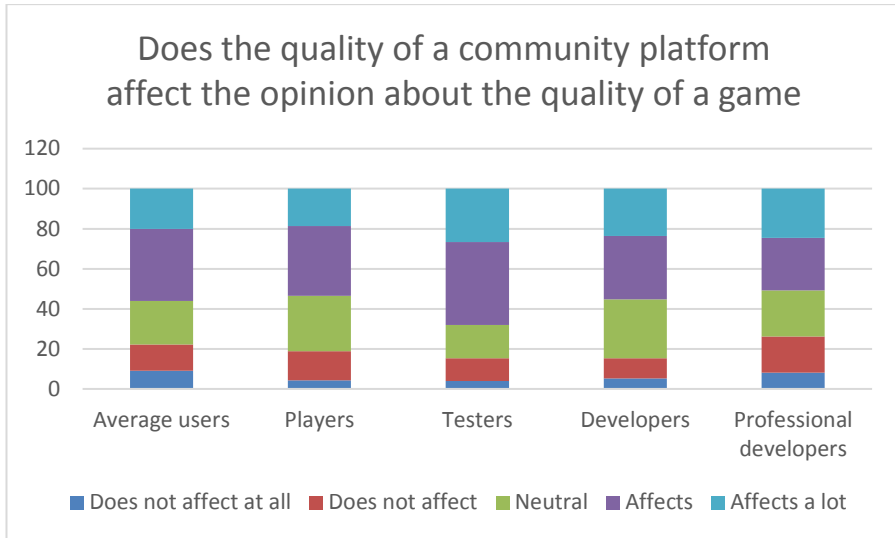
Figure 15.   *How much the quality of the community platform affects the opinion on the game*

As mentioned in the theory section, the usability of the community platform can affect the community members' level of activity. In the survey, the respondents were asked if the quality of the community platform affects their opinion on the quality of the game. All user groups think it does. As presented in figure 15, a bit over 20% of professional game developers think that it does not affect or does not affect at all, but since over half of the average users, players, testers, and developers see it affecting or affecting a lot, it is something that game companies should pay attention to.
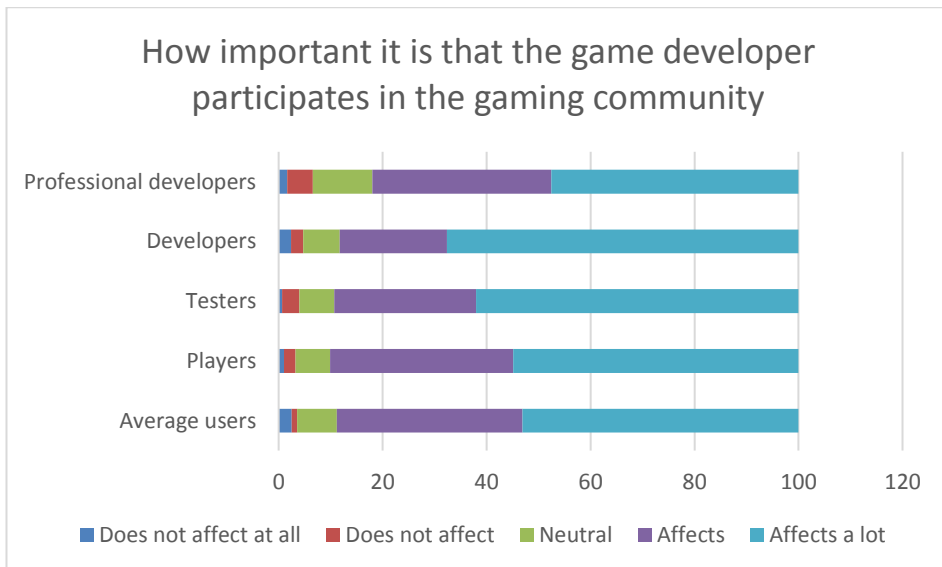

Figure 16.   *How important it is that the game developer participates in the gaming community*

The open answer of the survey indicated that the community platform does not need to be the developer's or publisher's own, but can be a popular and well working social media platform where the professional game developer has a presence.

Community management can affect the interest for joining gaming communities. The open answers to the question "what makes a game community good" indicates that moderation and limiting toxic behavior are important for people to feel good when participating in the community. The main motivations for being part of gaming communities are entertainment and getting information about the game. For the players group, helping others is also a big motivation, which is not surprising as they are the group that mainly creates tutorials for games. A small number of the survey's respondents from the average user and professional game developer groups do not attend any gaming communities. The different motivations for being part of gaming communities are presented in table 12.

Table 12. *Motivations for joining gaming communities.*

Motivation	Average users	Players	Testers	Developers	Professional developers
Entertainment	421	355	115	142	41
Getting information	526	435	135	132	49
Helping others	102	324	116	119	32
Satisfaction	188	228	82	105	26
Providing information	81	286	96	102	33
Being part of the game's development	65	101	78	63	36
Social enhancement	105	162	56	56	21
Belonging	73	134	48	45	14
Earning money	1	13	9	9	11
Trolling	13	28	12	8	4
I don't attend game communities	81	0	0	0	4
	n=642	n=494	n=150	n=170	n=61

Community members who spend the most time in the community can help others and have the most influence in the community (Gidhagen 2011). In Hsiu-Fen and Lin's (2006) study, 43% of respondents from a group of 165 community members spent over 5 hours per week in the virtual community. In this thesis' survey of 1525 respondents, the average time per week in game communities was from 5 hours to 22 hours depending on the age group. Considering the amount of time members spend in game communities, it can be seen that a healthy and enjoyable community makes up a big part of the enjoyment of the game.

The survey had an optional open question, "what makes a game community good", which was answered by 791 people. Answers were categorized to see which features make game communities good. Main categories of good game communities are communication

between developers and players, activity, moderation, and welcoming atmosphere. The respondents feel that in a good game community, the professional game developers, developers and players have a common goal in making the game better. They want to see respect between all members and be able to give and receive feedback. Transparency and openness from the game developers towards the community was also seen as an important matter. A good community also shares information and acquiring information is one of the major reasons for attending communities.

A good community is also active, which means users are creating content and developers are making modifications, and has a suitable number of members. For some respondents, a higher number of members was seen as making a community better, while some respondents thought small and active is better. Based on the answers, the number of people in a community does not have as big an effect as the behavior of the members does. A good community does not have toxic behavior or trolling, and everybody follows a set of rules and are nice to each other. The atmosphere ought to be encouraging and fun, and new players should be helped, not put down. The elements of a good gaming community are collected to in table 13.

Table 13.   *What are the elements of a good gaming community (n=791)*

Main categories	Elements of a good gaming community
Communication	Respect, common goal, co-operation, receiving and giving feedback, good game, constructive criticism, ideas, transparency, openness, information
Activity	Contests, user created content, modifications, sharing, interaction, discourse, number of members
Moderation	Mature behavior, no toxic behavior or trolling, tolerance, common rules, fairness, quality content
Welcoming atmosphere	Support, help, positive, fun, reliable, equal, friendly, encouraging, learning, sense of community, passion for games, and diversity.

In a good game community, the member gets help and can be who he or she is without being afraid of being teased. From nice community, some find even real friends who share the same hobby.

5.3 Good practices for community management in gaming communities

To manage a community well, it is important for the community manager to understand why the community members take part in the community and what they expect from the game development company. Findings collected from the survey and literature relating to good practices for community management in game communities are shown on table 14.

Table 14.   *Good practices for community management in gaming communities*

Tasks of the community manager	Community member motives affected
Share information about game design choices, offer customer support.	Getting information and help
React to community members' contributions, show them they matter.	Sharing information
Event organizing, contests	Entertainment, to kill time
Collect people for beta testing, collect their ideas and share them with the game development team.	Help with the development
Moderate toxic behavior, have clear and transparent behavior rules.	Trolling, unleash negative feelings
Communicate the game developer's reasoning and thoughts.	Communication

A game company can benefit from allowing modifications and sharing toolkits, using community resources by taking part in the community and by having a community manager or other dedicated employee communicating with the players. The company can offer social media platforms for the community and moderate them. The platform should be easy to use and work without disturbances.

Game communities and analytics can be utilized in all development phases. A good and active community increases product sales and prolongs the lifecycle of the game. Expansions and community-made modifications can keep the game interesting for players for many years with reduced costs for the game developer. However, there are also games

that are extremely successful without modifications, and companies not allowing modifications can keep their technology hidden from competitors.

Players find the presence of the game developer important in a game community. Players want to make the game better by co-operating with the game developer and other community members. Taking part in a game community needs to be fun and friendly. Problems faced in game communities are other players who behave in a toxic way towards others and troll. Negative behavior drives off contributing community members, leading the community to become less useful for the game developer. A negative community can even reduce the sales of the game.

A game company can reduce unwanted behavior by using good moderation and community management. The community should have clear rules, and the reaction to negative behavior should be fast. The game company should keep an active presence in the community by commenting on the feedback and being transparent about the development process by explaining the reasoning behind decisions.

Setting up a common goal with the community nurtures knowledge sharing and trust. Activity and information sharing is more important than monetary rewards and contests, because the strongest motives for joining communities are receiving information and social enhancement rather than receiving payment. To get the benefits from the community, the company community manager needs to actively share the received knowledge with the development team.

Contributing ideas and sharing them with the community costs player's resources, which is why the game company should reward the effort by also giving feedback to the players. An active feedback loop inspires the community to come up with better innovations. The game company should feel as part of the community, not the manager of it.

6. CONCLUSIONS

PC games have online gaming communities which collect a group of games enthusiastic together to share goals and ideas and communicate through internet. Gaming community groups can be divided to five groups: average users, players, testers, developers, and professional game developers. Average users are users who rarely contribute to community, but they follow the discussion, seek information and collect tips for their gameplay. Players share their knowledge, make tutorials, share gameplay videos, and communicate with the community. They also might experiment with the toolkits for modifications offered by the game like map editor.

Testers are the group who take part to game testing and share their feedback with the game development company. They are interest in taking part to the game development process and want to try out the new games. Developers make modifications to the games which can differ from small graphical changes up to complete overhaul of the game. Professional game developers are the employees of the game development company who develop the game. They can have a community manager taking care of the communication between the users and the company.

Game development company can utilize the communities in different phases of the game development process. In pre-production phase the game designer can seek information from different game communities what are the elements of the similar type of the game that users like and what kind of ideas they have shared to the communities. In case of a sequel the designers and community manager can collect the ideas feedback from the previous titles of the series. After making the concept and game design document the development moves to the actual production where the designed features are implemented to the game.

Production phase can be divided into alpha, beta and gold phases. Based on the survey the professional game developers see communities most useful in beta phase where companies often utilize testers for beta testing. Player made testing can enable the game development company to use bigger test group than would be financially possible. After releasing the game the community can contribute ideas for post-production and sequels.

On top of sharing ideas and helping with testing the game communities can help to prolong the lifecycle of the product, create more content to the game and help other players with tutorial videos and game wikis. Player made reviews and let's play videos are also marketing for a game and can have a large affect to purchase decisions. Based on the survey the community activity and feedback is important or very important when deciding to buy the game or not.

As the community feedback and activity can have a big effect to titles success, the game development companies should consider taking part to communities. Many companies have an actual community manager working with the communities. The survey showed that all user groups valued the presence of the professional game developers in the community. Active communicating and feedback sharing between the professional game developer and users motivates to share knowledge and helps to build trust inside the community. A good community also needs moderation and clear rules to keep the atmosphere friendly and safe. Toxic behavior can paralyze the community and make it less useful for game development company as well as for the users.

Community members take part to game communities to have fun and entertainment. They seek information like gameplay tips or detail knowledge about the design choices made by the company and want to know about upcoming expansions or free updates. Many players, testers and developers are also motivated to help other players and want to provide information. Only small number of community members are motivated by earning money or trolling. For game development companies the motives are to enable the information of online companies, cost saving in customer support, marketing, to seek employees as well as creating a brand loyal customer base.

The potential of game communities is to increase the sales of the game, prolong its lifecycle and to reduce the development costs. Allowing modifications can be successful decision, but there are also many games who are very popular even if modifications are not possible. Modifications contain risks of intellectual property leakage and modification support also uses resources. The successful utilization of the game communities is also dependent on how successful the company is with the community management. Badly maintained community can lead to negative outcome where the community reduces the sales rather than increases them. Community management should aim for relationship building creating trust, satisfaction, and emotional attachment inside the community.

The research received a relevant number of answers from PC gamers and the survey results were in line with the earlier studies about the community participation motives. The research had some limitations. First, the survey received only 61 responds from professional game developers. Second, the data was collected from couple of online gaming community platforms which means that the group of respondents was not random. Third, it is difficult to tell if the respondents were serious when giving the answers as well if they understood the questions correctly. Future research could aim to create a better understanding in how many ways the companies utilize the communities and what kind of processes they use for it.

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APPENDIX A: QUESTIONNAIRE FORM

Importance and roles of communities and community management in game development

Questions with * are required

1. Age *

| 26 | ⇕ | years |

2. Sex *

- ○ Male
- ⦿ Female
- ○ Other
- ○ Prefer not to say

3. In which country are you living in? *

Country names are in English.

| Belgium | ▽ |

4. Are you a PC gamer? *

In this survey, a "PC gamer" means a person who plays computer games on Windows, Mac or Linux platforms.

- ⦿ Yes
- ○ No

5. Are you a PC game developer? *

Are you working in a company which makes games for Windows, Mac or Linux platforms?

- ⦿ Yes
- ○ No

6. What is your position? *

- ☐ Artist
- ☐ Community Manager
- ☐ Game designer

- Management
- Marketing
- Programmer
- QA
- Other, what? [　　　　　　　　　　　]

7. How important do you feel **the game analytics** are in the game development process? *

	1	2	3	4	5	
Not important	▢	▢	▢	▢	▢	Very important

8. How important **the game analytics** are in the game development process in the company you work at? *

	1	2	3	4	5	
Not important	▢	▢	▢	▢	▢	Very important

9. In which of the game development process phases would you utilize the **game analytics**? *

- Concept Development
- Design
- Alpha phase
- Beta phase
- Gold phase
- Post-production
- I wouldn't use at all

10. How important do you feel the **game communities** are in the game development process? *

	1	2	3	4	5	
Not important	▢	▢	▢	▢	▢	Very important

11. How important **the game communities** are in the game development process in the company you work at? *

	1	2	3	4	5	
Not important	▢	▢	▢	▢	▢	Very important

12. In which of the game development process phases would you utilize the **game communities**? *

- Concept Development
- Design
- Alpha phase
- Beta phase
- Gold phase
- Post-production
- I wouldn't use at all

13. What game communities do you follow or attend to? *

- Game forums
- YouTube
- Streaming
- Modding
- Game testing
- Facebook
- Reddit
- Twitter
- Game Wikis
- LAN parties
- IRC channels
- Other [   ]
- I don't follow or attend to any

14. Do you create content to game communities as a participant of a game community? *

- I make mods
- I write to the forums
- I write to Reddit
- I write to Facebook
- I write to Twitter
- I stream games
- I make YouTube videos of games
- I test games and give feedback
- I write to wikis
- I make fan pages
- Other, what? [   ]
- I don't create any content

15. Estimate how many **hours per week** you use as a participant of a game community? *

[   ] hours per week

16. Why do you follow or create content to gaming communities? *

- Getting information
- Helping others
- Provide information
- Social Enhancement
- Entertainment
- To be part of the game development
- Satisfaction
- Belonging
- Earn money
- Trolling
- Other, what? [   ]

⊜ I don't create content or follow game communities

17. How important is it to you that game developers participate in game communities? *

	1	2	3	4	5	
Not important	▯	▯	▯	▯	▯	Very important

18. Does the quality of the community platform provided by the game developer affect your opinion about the quality of the game? *

	1	2	3	4	5	
Does not affect at all	▯	▯	▯	▯	▯	Affects a lot

19. What would you say are the main roles of a community manager? *

⊜ Brand evangelist
⊜ Communication between developers and community
⊜ Content creation
⊜ Customer support
⊜ Community evolution
⊜ Metrics and or research
⊜ Hosting events
⊜ Administration
⊜ Recruitment
⊜ Internal rallying
⊜ Dispute moderation
⊜ Training
⊜ Product education
⊜ Game development
⊜ Other, what? [   ]

20. What do you feel makes a game community good?

[   ]

21. How do you feel about modding? *

⊜ It makes games more interesting to play
⊜ It breaks games
⊜ It is a good way to show your skills in game development
⊜ Modding should be supported in games
⊜ Games don't need modding
⊜ Modding is a nice addition to the games
⊜ Modding is vital for the games to be good

© I don't want to use mods, why |

© I don't have an opinion

22. When buying a game it is important to me that the game is moddable *

	1	2	3	4	5	
Not at all important	▯	▯	▯	▯	▯	Very important

23. When buying a game it is important for me that the game has an active community *

	1	2	3	4	5	
Not at all important	▯	▯	▯	▯	▯	Very important

24. When choosing to buy a game, community feedback affects my decision *

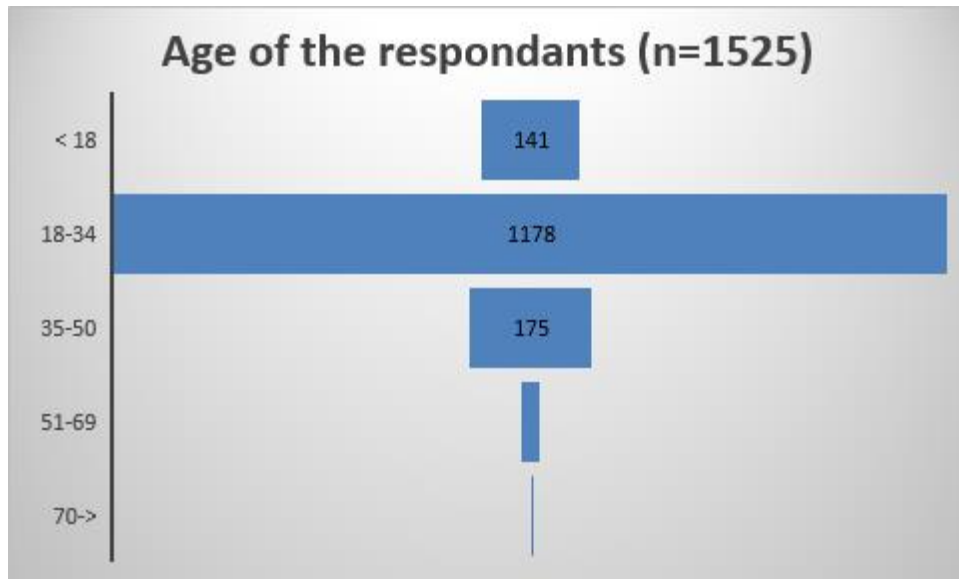|	1	2	3	4	5	
Does not affect at all	▯	▯	▯	▯	▯	Affects a lot

100% completed

APPENDIX B: RESULTS OF THE QUESTIONNAIRE

1. The age of the respondents:

Age of the respondants (n=1525)

Age	Count
< 18	141
18-34	1178
35-50	175
51-69	
70->	

2. The gender of the respondents:

Gender of the respondants (n=1525)

Gender	Count
Male	1445
Female	62
Other	
Prefer not to say	
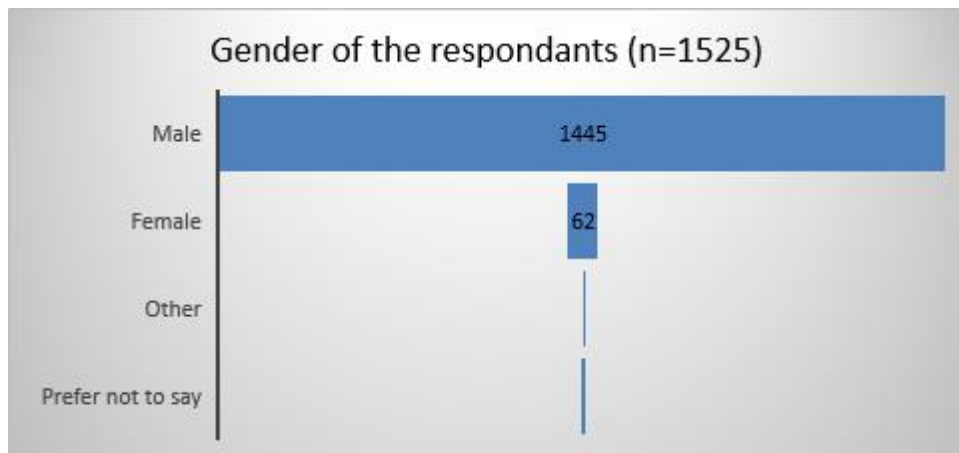
3. The countries of residence of the respondents:

Afghanistan	1
Albania	1
Algeria	1
Argentina	2
Australia	43
Austria	14
Bahrain	1
Belarus	4
Belgium	11
Brazil	23
Canada	76
Chile	5
China	4
Colombia	1
Costa Rica	3
Cote d'Ivoire	1
Croatia	3
Czech Republic	10
Denmark	24
Dominican Republic	1
Egypt	1
Estonia	1
Finland	298
France	32
Germany	140
Greece	5
Hungary	11
India	3
Indonesia	2
Ireland	8
Israel	3
Italy	9
Japan	1
Jordan	1
Latvia	2
Liechtenstein	1
Lithuania	5
Macedonia	1
Malaysia	4
Mexico	5
Netherlands	55
New Zealand	9

Norway	23
Pakistan	1
Paraguay	1
Philippines	5
Poland	22
Portugal	6
Romania	4
Russia	9
Saudi Arabia	1
Singapore	6
Slovakia	5
Slovenia	3
South Africa	5
South Korea	3
Spain	19
Sweden	37
Switzerland	11
Taiwan	4
Turkey	9
Ukraine	3
United Arab Emirates	2
United Kingdom (UK)	125
United States of America (USA)	388
Venezuela	2
Vietnam	1

4. Are you a PC gamer?
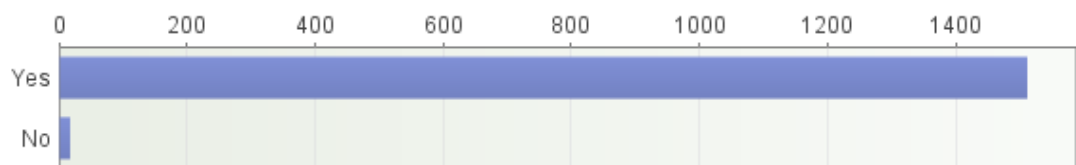
5. Are you a PC game developer?
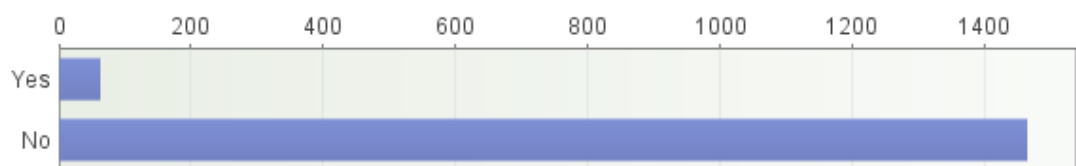
6. What is your position? n=62
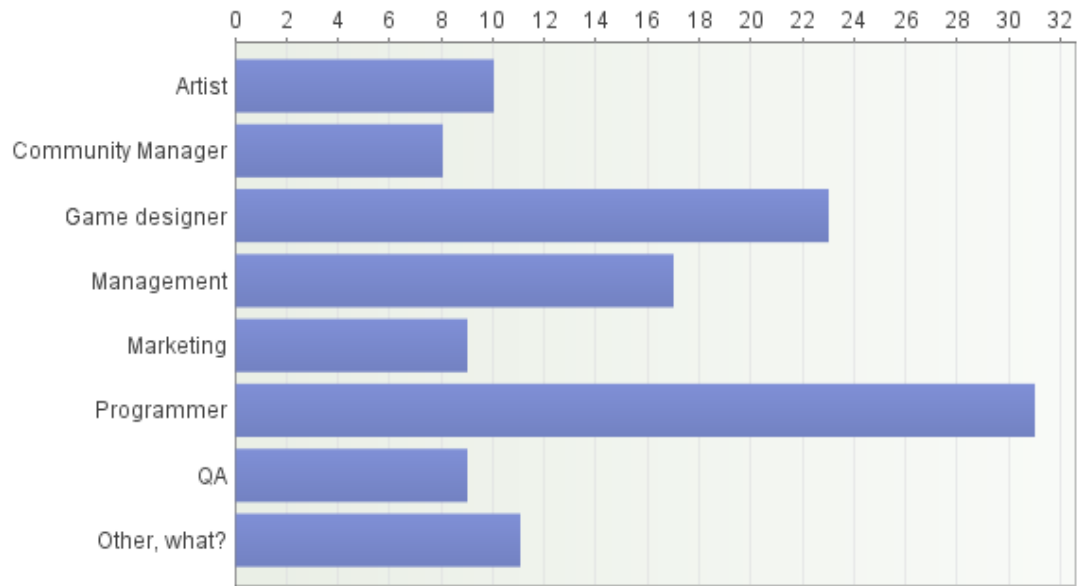
7. How important do you feel game analytics are in the game development process? n = 62

	1	**2**	**3**	**4**	**5**		**In total**	**Average**
Not important	3	3	8	29	19	Very important	62	3,94

8. How important are game analytics in the game development process in the company you work for? n = 62

	1	**2**	**3**	**4**	**5**		**In total**	**Average**
Not important	6	8	18	16	14	Very important	62	3,39

9. In which of the game development process phases would you utilize game analytics? n = 62
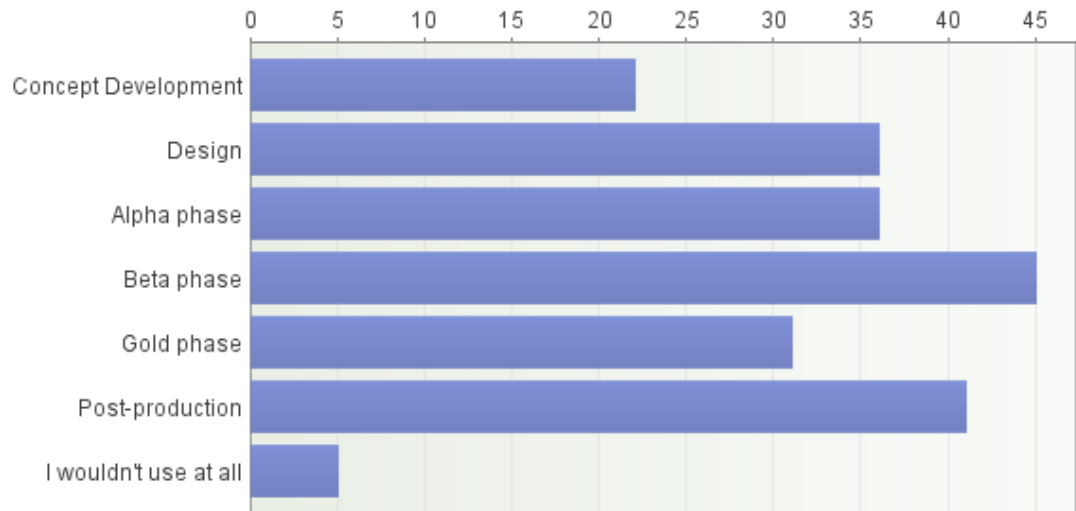
10. How important do you feel the game communities are in game development process? n = 62

|	1	2	3	4	5		In total	Average
Not important	1	3	8	22	28	Very important	62	4,18

11. How important are game communities in the game development process in the company you work for? n = 62

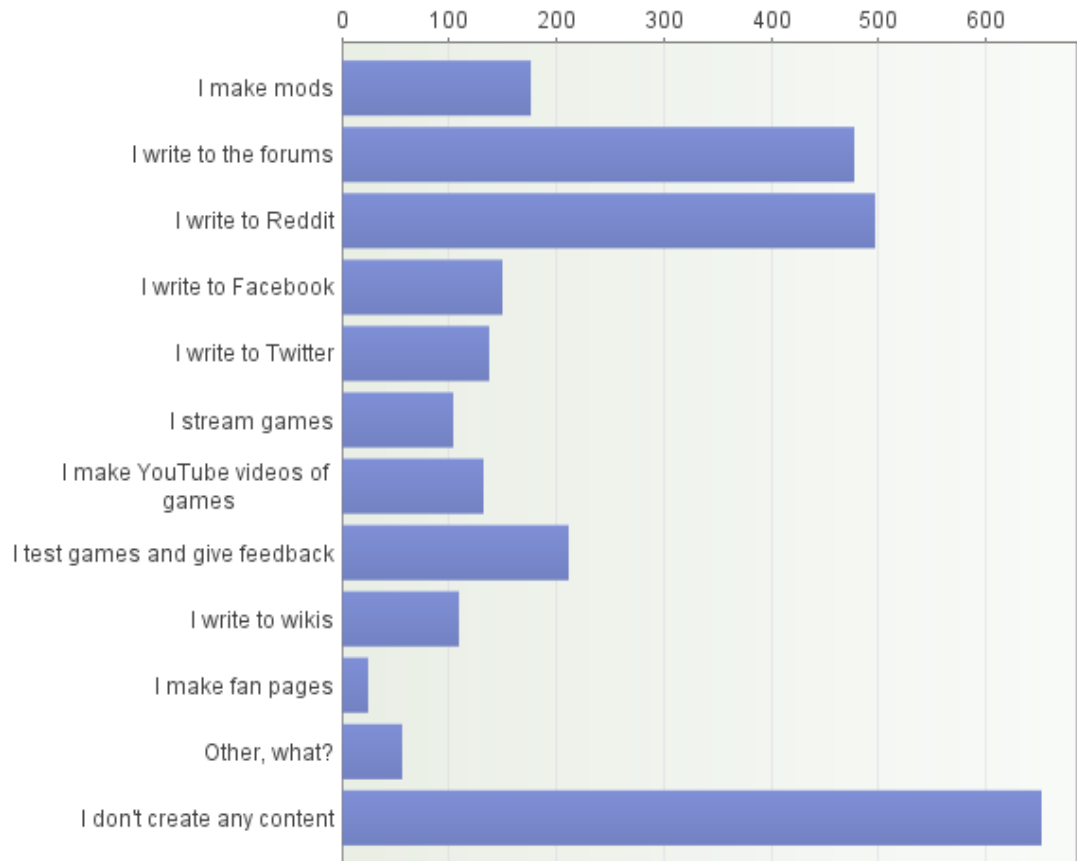|	1	2	3	4	5		In total	Average
Not important	5	2	12	28	15	Very important	62	3,74

12. In which of the game development process phases would you utilize game communities? n = 62
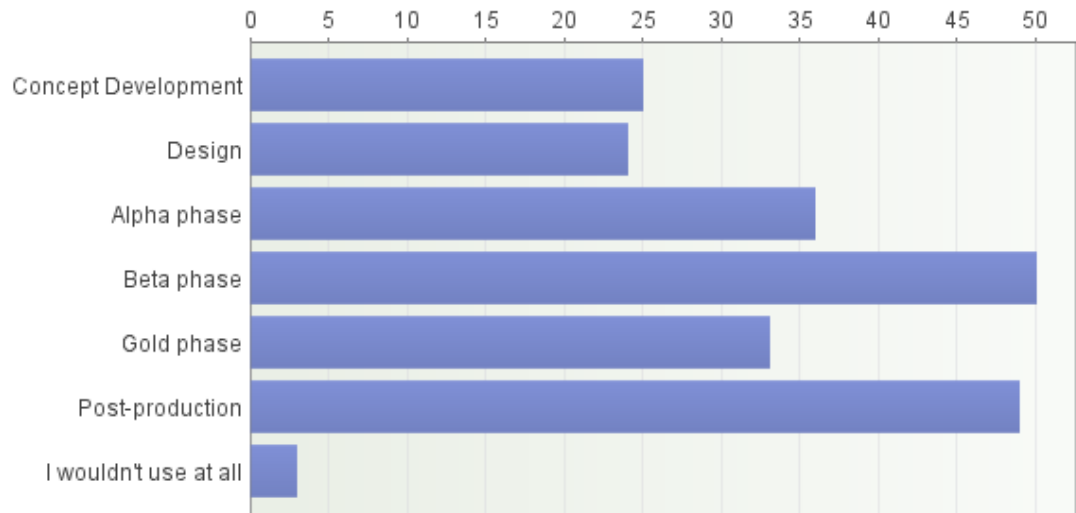
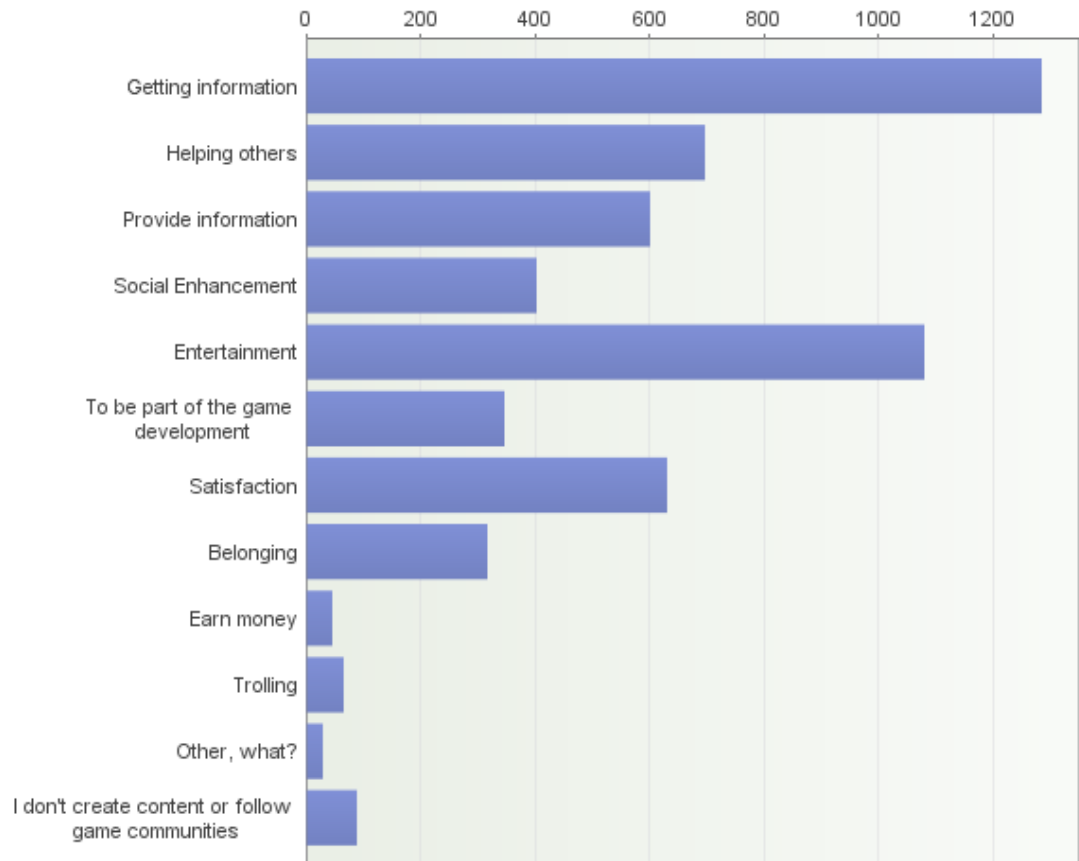13. What game communities do you follow or attend? n = 1525
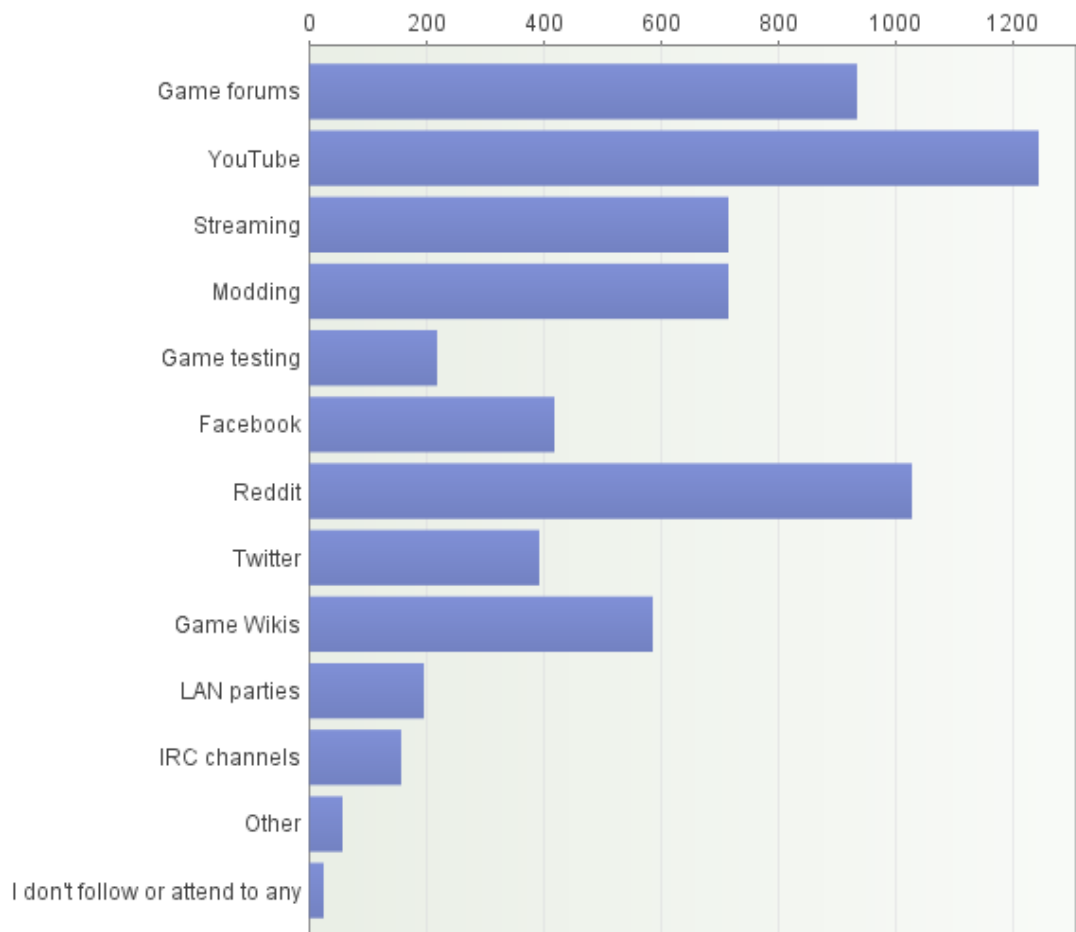
14. Do you create content for game communities as a participant of a game community? n = 1525

15. Estimate how many hours per week you use participating in a game community?
    n = 1524

16. Why do you follow gaming communities or create content for them? n = 1525

17. How important it is to you that game developers participate in game communities? n = 1525

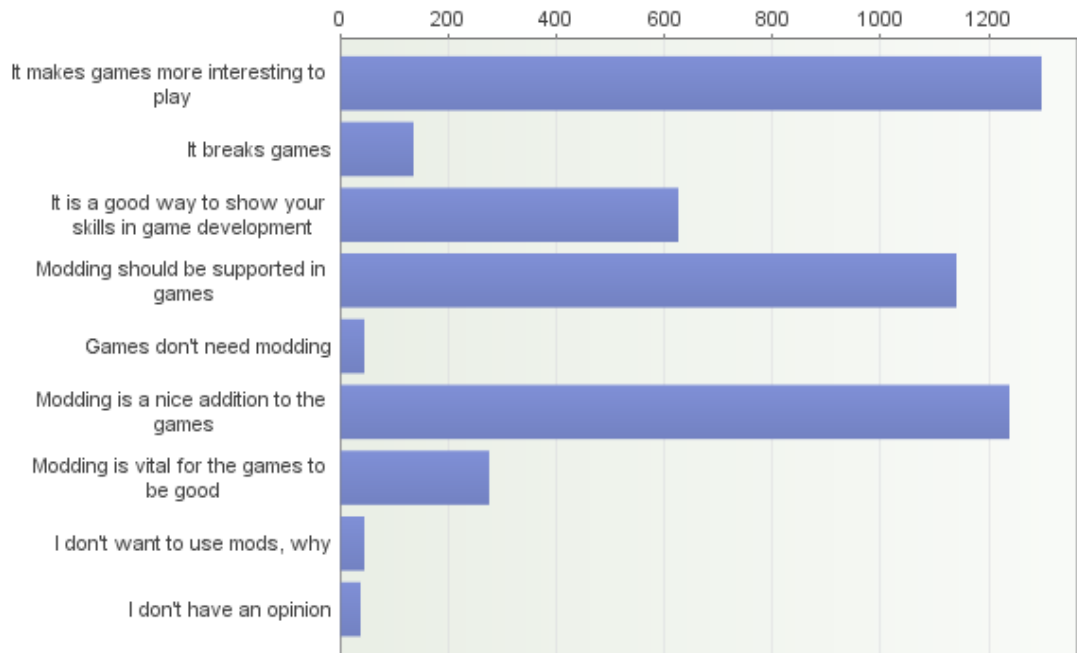|	1	2	3	4	5		In total	Average
Not important	28	30	111	504	852	Very important	1525	4,39

18. Does the quality of the community platform provided by the game developer affect your opinion about the quality of the game? n = 1525

	1	2	3	4	5		Yhteensä	Keskiarvo
Does not affect at all	100	205	367	536	317	Affects a lot	1525	3,5

19. What would you say are the main roles of a community manager? n = 1525
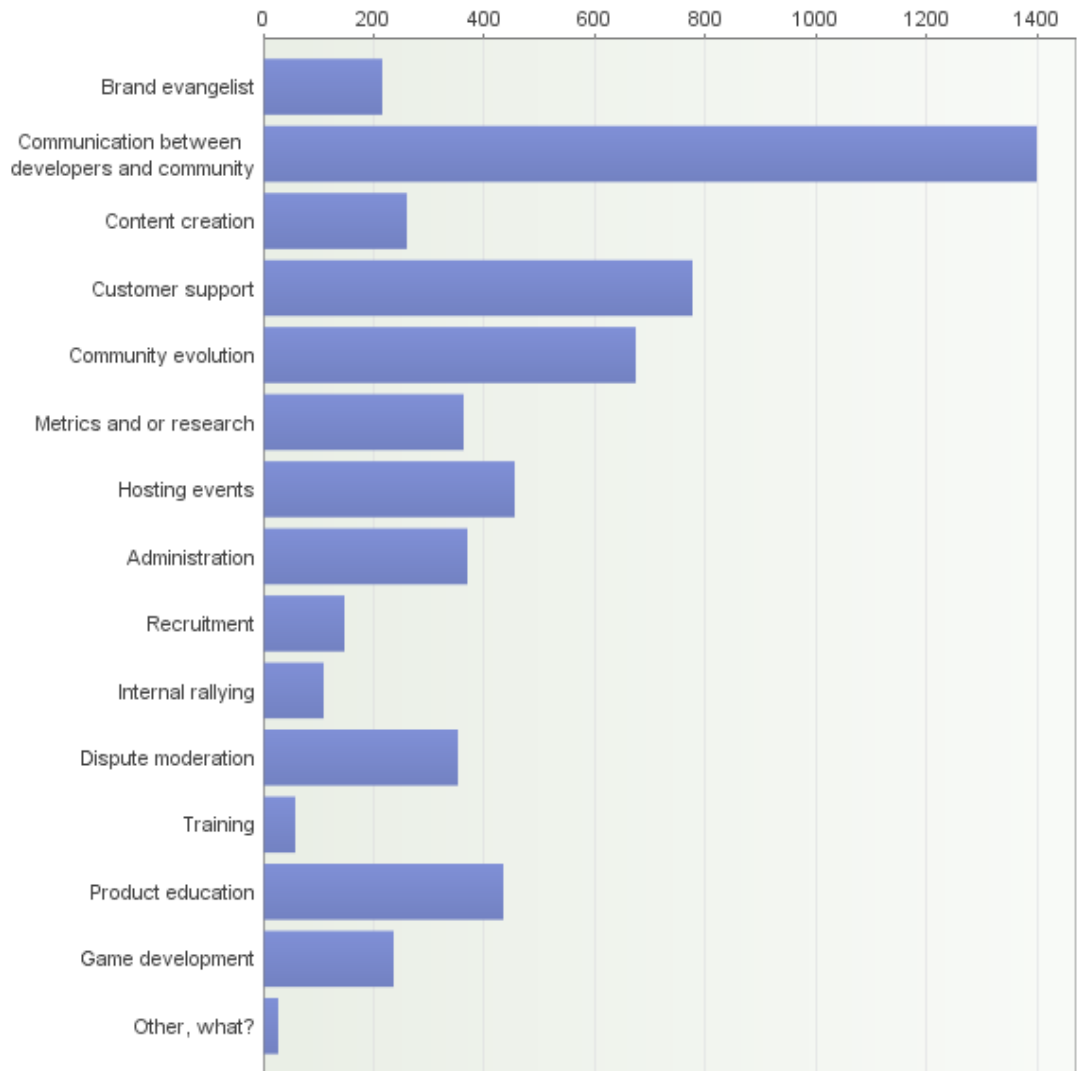
20. How do you feel about modding? n = 1525

21. When buying a game, it is important that the game is moddable? n = 1525

	1	2	3	4	5		In total	Average
Not at all important	219	267	517	398	124	Very important	1525	2,96

22. When buying a game, it is important that the game has an active community? n = 1525

	1	2	3	4	5		In total	Average
Not at all important	99	190	393	544	299	Very important	1525	3,49

23. When choosing to buy a game, community feedback affects my decision? n = 1525

	1	2	3	4	5		Yhteensä	Keskiarvo
Does not affect at all	27	62	236	613	587	Affects a lot	1525	4,1

24. What do you feel makes a game community good? n = 791