Development and Forecast of Esports Industry

Thesis

Jaromír Ryška

Master's thesis
November 2022
School of Business
Degree Programme in Sport Business Management

jamk | Jyväskylän ammattikorkeakoulu
University of Applied Sciences

Jaromír Ryška

Development and Forecast of Esports

Jyväskylä: JAMK University of Applied Sciences, November 2022, 92 pages

School of Business, Degree Programme in Sport Business Management, Master Thesis

Permission for open access publication: Yes

Language of publication: English

Abstract

The purpose of this master thesis is to introduce readers to the electronic sports (esports) and video game markets, their historical development, and to identify and analyze the market growth based on selected aspects. Subsequently, these analyzes are used to create a future forecast of the development of esports, which can serve companies and stakeholders who participate in this relatively young and developing market.

The first part of this work describes the history, structure, definitions, viewership, characteristics of game organizations, tournaments, platforms and basics of the video game and digital game markets focusing on esports from the point of view of the market in general, including the Czechia market.

The primary intent of this master thesis is focused on analysing the video game and esports markets, looking at their financial, demographic and user statistics, which formulate the development growth forecast of the esports in the coming years. Quantitative, qualitative and logistic methods are used to estimate the future development of this industry and its possible direction. This work also includes a small case study that takes into account the situation regarding the Covid-19 pandemic that started in 2020.

The last part of this master thesis work is used for summary, predictions of the esports industry, discussion and answers to the main questions of the master thesis.

Forecasting methods were used to forecast the development of esports. These are mainly methods of least squares and time series analysis, which were sourced from the data obtained from the analysis. For this master thesis, secondary data was used mainly from the period 2012-2020 from varied sources.

Forecasts of the future development of esports are primarily displayed with predictive figures of the esports and video games market growth until 2030. Esport market enthusiasts, potential sponsors, entities and companies might be interested in the recommendations compiled in this work from which a possible business can benefit.

Keywords/tags (subjects)

Esport, electronic sport, esport market, video game market, gaming, forecasting methods, development, competitive playing

Miscellaneous (Confidential information)

Contents

Figures

Tables

Terms and Abbreviations

MIT – Massachusetts Institute of Technology

FPS – First Person Shooter

RTS – Real Time Strategy

KeSPA – Korean E-sport Association

MLG – Major League Gaming

NBA – National Basketball Association

ESL – Electronic Sports League

PGL – Professional Gamers League

MOBA – Multiplayer Online Battle Arena

ESWC – Electronic Sports World Convention

WCG – World Cyber Games

LoL – League of Legends

MASE – Mean Absolute Scaled Error

SMAPE – Symmetric Mean Absolute Scaled Error

MAE – Mean Absolute Error

RMSE – Root Mean Square Error

CAGR – Compound Annual Growth Rate

ASMR – Autonomous sensory meridian response

VR – Virtual Reality

1 Introduction

The term esport is no longer an unknown term. Nowadays, when everything is digitizing, new technologies are evolving and the world is accelerating, it is an ideal time for the esports market. Its popularity as an industry is growing rapidly every year and is becoming more watched than classic sports. Esport is developing worldwide and Czech esport is no different.

The author chose this topic because during the covid-19 pandemic, esport became known to a large part of the population, both in the Czech Republic and around the world. Another reason to choose this topic was based on an article from October 2021 named: "*Esport Market Statistics: 2030"* (Rachita.R, 2021), where the predictions were made until year 2030. This will be interesting to monitor the impact of the current situation on this growing entertainment industry and to set new development forecasts.

The development of electronic sports can be observed in parallel with the development of computer games. There are thousands of small or big gaming teams in the world at the moment, bringing together thousands of computer and console players. The competitions have clear rules and can be attended by both amateur and professional players. As with sports, the use of illicit substances or unauthorized equipment is monitored, with an emphasis on fair play. A very important economic component are sponsors who are interested in visibility and at the same time brings revenue to the esport. The biggest cash prize for a given tournament is millions of dollars in the most popular games. Streamers, like the people who broadcast the match, comment on it for the audience.

One of the results of digitization of today's culture is the fact that many things around us, including esports, are being redefined. The growth of esports commands a faster pace than any other sport, or even any other leisure activity. What kind of economic structure is the basis of development? Who benefits from growth in this industry? How can companies participate as investors or sponsors? With incoming investors, sponsors, customers and more public attention, esports are growing. This raises the questions of whether it will be sustainable in a few years.

The entire video game market is aimed at young generations, which represents a huge potential in today's digital world. The player base and spectators are mainly represented by young people who, thanks to their abilities, move esport to the top of the entertainment industry. It will therefore be

very interesting to monitor selected aspects and predict their development in the future, as esports have a great opportunity to become known to a large part of the population, for example through global esporting events.

The result will be a prediction of the development of the esports market, which is becoming a phenomenon in the entertainment industry nowadays. This should indicate the growing value of esports. At the same time, to show the potential possibilities and possible threats that this development may incur. Comparative strategies, analytical studies and results from the most well-known companies interested in the esport market will be used to achieve the goals. It is a systematic settlement and comparison of already processed publicly available data. The drawn data will be analysed by using tables, graphs, pictures and formulas in Microsoft Office Excel software. From the available financial and data indicators, the values will be matched into formulas and functions for a more accurate estimation of the performance of the future state predictions.

2 Esport and Video Game Market

In this part of the master thesis, the concepts related to the given work issue are described in more detail. To explain the development of esport, it is important to mention what was behind the creation of video games in the past and to describe a brief historical overview. The growth and development of video games began in the middle of the 20th century, but it is now experiencing a great boom in the 21st century, when electronic sports came into play (Wolf, 2018). According to Stenger (2022), there are three basic reasons why it is important to focus one's professional view on video games. The popularity of video games, the size of the gaming industry and the interaction between the computer and the human being.

2.1 History of Video Games

The first mention of video games comes from Cambridge in 1952, where A.S. Douglas created the game OXO, now which is known as Five in Line or Tic-Tac-Toe. In 1962, Steve Russel of the Massachusetts Institute of Technology (MIT) created the first space computer game called Spacewar! The game was playable only on the most powerful computers, which at that time were only found at universities (History.com, 2017).

In year 1967, developers at Sanders Associates, Inc., developed a prototype of a multiplayer and multiprogram video game system which can be connected and played on television. The system was called "The Brown Box". Developer Ralph Baer, who is sometimes described as the founder of video games, licensed his equipment to Magnavox. The company sold the system to consumers in 1972 under the name Odyssey. It was the first home video game console (Chikhani, 2015).

The first released video game commercially, based on the arcade game, is Computer Space from 1971. Since 1978, game genres have started to be distinguished, so they have been classified. The next decade was a struggle for better technological design, to be different from others - story, system, platform, etc. The video game market boomed in the mid-1990s. Games began to move from 2D to 3D perspective, competition began to increase in the production of game consoles and computers and also in the development of games, and thus computer games became more and more popular with the population at the time (Wolf, 2018).

2.2 Definition of Video Gaming

Most people think of a video gaming as a game which is played on a computer, in short, a PC game. The claim that a video game is only played on a computer is wrong. Wolf (2018) states that the term video game means a game on any platform (PC, mobile phone, Xbox). In the past, arcade games were popular in casinos, where video games were played on slot machines. Nowadays, playing take place on Xbox consoles, PlayStation, computers and mostly on mobile devices predominates.

Esposito (2005) defines video games as: "Games that are played using an audio-visual device and that can be based on a story." The author further states in his article that the game is a voluntary interactive activity in which one or more players follows the rules that limit their behaviour, thus creating an artificial conflict that ends in a measurable result. Games are considered virtual because they do not manipulate elements in the real world.

2.3 Digital Games

In 2017, at a conference in California, well-known analyst Meeker, who discusses Internet trends, stated that games and their development bring technological manufacturing innovations and modern learning to other industries. According to a 2017 study (Entertainment Software Association, 2018), revenue in the gaming industry, not to mention the gambling industry, reached a record of $36 billion in the United States. These calculations include both hardware and software costs, game payments and subscriptions. In 2016, it was 18% less, which is proof of a rapidly growing industry. It is clear that the impact of digital games, as well as their potential and use of field of action, is growing in importance (Stenger, 2022).

Digital games are one of the latest trends. This is an area that includes games that may not use a display device and may not have a visual display at the same time. For example, extended worlds and virtual worlds, where space is simulated. At the same time, it would mean that it would be a superior term for video games. That is, all the electronic games that we are able to play with the help of various display devices. The characteristic features here are: rules, player skills, results, rivalry, simulations (Chapman, 2012).

2.4 Esports

Esports have appeared under several names in the past. Electronic sports, pro-gaming, gaming, cyber sports, competitive gaming, digital gaming. There is the same meaning under every term. It is about "competitive, professional playing of computer games in an organized format with a certain goal between players and teams that compete against each other" (esport.cz, 2020). It is operated with the help of electronic systems that play video games. They can be grouped both in the form of multiplayer and in the form of single player. At the same time, they are played both at the level of amateurs and at the highest quality - professionals (esport.cz, 2020).

According to Heinzman (2022), we can consider esport as competitive (professional and amateur) video game play, which is in cooperation with various leagues, tournaments and rankings, where individuals usually gather in teams or gaming organizations. These teams and gaming organizations are then sponsored by business organizations. It is the influx of capital, the increased popularity of games, the ability to stream, watch games through channels such as YouTube or Twich.tv, which have supported and accelerated the rise in popularity of esports to what it is today.

The term esport is nowadays an inflected word in many articles, on television and in print. It appears in various forms and therefore it is necessary to look at what is the correct written form of this term. In 2020, the Czech Sports Association turned to the Institute for the Czech Language to recommend the correct form of this term. Dr. Kamila Smejkalová stated:

> "*The Czech Association of Sports recently asked the Institute for the Czech Language to comment on the term esport. Basically, all possible variations appear in the narrow range: esport, eSport, Esport, e-sport and e-Sport. The association has chosen the esport variant, which is, however, minimal e-sport clearly predominates"* (esport.cz, 2020).

However, the Czech Sports Association recommends the more modern term esports (written without a hyphen), which is also preferred by the general public, colloquially.

One of the main problems currently facing esport is the question: "Is esport really a sport?". This issue is raised by journalists, reporters and the news media around the world. Another good question around esports is, how can a person enjoy watching games they have never played or watched before, themselves? The answer to this question may sound simple. It is the same as in any other

sport. How can we enjoy watching a hockey game if we have never played or watched it before? Most hockey fans, for example, know the rules, but do not play hockey. The same logic applies to esports. One survey conducted by Forbes found that up to 44% of esports spectators do not play the game they are watching. This largely confirms that esports are truly spectator entertainment (Tassi, 2015).

2.4.1 History of Professional Gaming

The first mention of competitive gaming dates back to 1972. Good (2012) states that the first multiplayer gaming dates back to October 19, 1972, when the first Spacewar tournament took place at Stanford University in the United States. Two tournaments were played. The individual tournament won by Bruce Baumgart and the team tournament won by Robert Maas and Slim Tover. All winners received the same prize – Rolling stone magazine annual subscription.

If we take only PC games, the first official esports tournament was held in 1997. There were over 2,000 players who wanted to compete in an event called Red Annihilation in the FPS (First Person Shooter) game Quake. The winning prize was a spectacular Ferrari car donated by Quake's lead developer John Carmack (Edwards, 2019).

Tournaments were held every year, mostly in FPS, sports and arcade games, but there was a big break in the late 90's. A new genre of the game came to the fore, specifically RTS (real time strategy). It was StarCraft: Brood War game. This game become the most played game in South Korea. It is even reported that more than half of South Korea's population at the time was playing StarCraft over the Internet (eSports, 2020). Korean government established the Korean e-Sports Association (KeSPA) In 2000, which is affiliated with the Korean Olympic Committee and covers esports throughout the whole country. The popularity of the esport grew around the world, and due to the great interest in this new entertainment industry, new competitions and tournaments began to be created. Among the first and best known were the Electronic Sports World Cup (Electronic Sports World Convention – ESWC – nowadays), the World Cyber Games (WCG), and Major League Gaming (MLG), which was founded in 2002. This organization managed to get a Halo tournament aired on the USA Network television. The popularity of the esport has grown so fast that the viewership was starting to increase in viewership faster than normal sports. In 2012, the All-Star Game event was more watched than the US NBA (National Basketball Association) (Sobola, 2019).

2.4.2 Structure of Esports

The structure of esports, presented by the Czech Association of Sports (esport.cz, 2020), does not differ so much from the structure of ordinary sports. There are organizers who organize competitions, leagues, championships and tournaments. Both individual players and game teams take part in these competitions. For the esport to be popular, it must be watched by spectators, which are very important role in the structure of the esport. Furthermore, streamers, influencers and commentators appear in the structure, which are players or spectators who broadcast esports matches on their viewing channels and at the same time comment and share them for viewers. They therefore mediate the reach of the esport to the general public. Furthermore, we must not forget the sponsors, for example companies or individuals who bring capital to the esports environment, thanks to which esports can grow and gain in popularity. Sponsorship investments provide professional gaming equipment for players and entire teams.

2.4.3 Players and Team Environment

Team and players are a key resource for tournament organizers. Professional players who are part of an esports organization or club have contracts as professional athletes who are at the highest level (Attwood, 2015). Today, players look like athletes, receiving athletic visas in order to travel abroad for matches and tournaments in various leagues and competitions. Player contracts, such as in regular sports (football, hockey), are bought and sold at the end of each esport season, so it could happen that a professional Czech player could play in an American team (Daniels, 2020).

This opens up new opportunities for people. In many cases, esports clubs or teams live in the same house provided by the organization. It helps build team spirit and is usually used for teams with younger players to help them with their studies and the psychological problems that come as these players begin to move toward the top, bringing fame and money (Taylor, 2015).

There are also stars in esports, since some players excel over others. One of them is, for example, the Korean player Faker, who is often referred to as God and is one of the most valuable players in the entire market. In 2016, the value of this player was over 2.5 million US dollars. It is no wonder that SK Telecom T1 is trying to keep this player in its team (Carpenter, 2016).

In most cases, especially FPS games, it is more common for teams to set up so-called camps, where a particular team will live in one place about a month before a major tournament such as PGL (Professional Gamers League). Teams usually cover the cost of the tournament and also a small portion of the tournament's earnings. In some cases, the sponsors pay everything and the team takes all the money for themselves for a well-placed tournament. In many cases, depending on a player's popularity, teams may require their players to stream live and public games to an audience. This increases the visibility of the individuals, sponsors, teams and organizations. This leads to an increase in the value of the player, the team and by extension, the company and the sponsors (Chaloner, 2015).

It is common for players to change teams, especially after big events and tournaments. For example, after the International Tournament, only a few teams remained the same. Many players and teams changed or were completely dissolved. Dota 2 and League of Legends are games that change every month - adjusting the statistics of specific characters, changing the price and many other factors that affect the course of the game. All this leads to a change in player performance. Therefore, staying at the highest level is very stressful. Stress plays a big factor here, especially for young players. For this reason alone, teams must be very careful not to divide the team's spirit and destroy its morale (Carpenter, 2016).

2.4.4 Esports Streaming and Platforms

Game streaming makes a significant contribution to the growth of all esports. It is about recording gaming and subsequent broadcasting via Internet television. The Twitch.tv platform was the first to be set up for this. It was founded by Kane J. and Shear E. In the beginning, it was used only for selected players who shared their content, but today it is freely accessible to everyone. Streamers may not be at the highest level here, but prefer to act as actors or comedians to captivate the audience. If viewers like it, they can buy a subscription from them. It used to cost 5 dollars, 2 dollars will get a streamer and 3 dollars will get Twitch.tv. This trend spread very quickly among the players and the platform grew in popularity. The founders therefore decided to penetrate the world of major tournaments (Li, 2016).

The first time the DreamHack tournament aired, the site did not withstand the onslaught because the interest was enormous. The second unfavourable factor was that Twitch did not have paid game licenses. All the rights to broadcast tournaments do not belong to the organizer, but to the game

studio itself. Those in the vision of great potential were provided for a symbolic price. Twitch became even more popular and got into the game consoles. In 2015, it even exceeded 100 million viewers per month. This has attracted more and more sponsors to esports. With that came big investment and the rapid growth of esports. Twitch is the market leader today. We can only consider YouTube Gaming, which was founded by Google, as its competitor, when Twitch.tv did not want to be bought from them. At the same time, the broadcaster has the power to influence the viewers' decisions and becomes the so-called influencer (Li, 2016).

Game streaming plays a huge role in the esports market. Thanks to the broadcasting of games, it significantly contributes to the growth and popularity of the entire esport and video game market (Chapman, 2017). In recent years, esports have begun to be broadcast on television channels, but mostly only in Asian countries. The best-known and most widely used platform is Twitch.tv, which was founded in 2011. It was released as an expanded version of the existing Justin.tv platform, a live streaming service founded by Emmett Shear and Justin Kan in 2007. Until 2020, Twitch was the only place to streaming video game content online and with up to ten million active streamers each month.

A streamer is a person who shares their online or other content online and viewers can watch it in real time. The author Brightman (2015) states that in 2013, the monthly viewership of unique viewers was 45 million. Twitch also attracts a huge number of companies that pay for their ads here, thanks to its huge reach and viewership (Streamersplaybook.com, 2019). Today, this tracking platform can also be used to financially support players and streamers, as this service has made it possible to send money via donate. The second way to support game content creators is to purchase a so-called subscribe. The more the service gained in popularity, the more the founders decided to penetrate the broadcasts and major tournaments.

2.4.5 Games, Organizations and Tournaments

In this part of the master thesis the author will describe most important individual esports games and tournaments. The games and tournaments that have the largest audience and the largest prize pool were selected. Thanks to the gaming scene, it was necessary to fill new jobs (e.g.: commentators, analysts). More than 4,500 competitive events take place every year. These include various league competitions, tournaments, world championships, etc. The system is quite similar to normal sports events.

ESL

The Electronic Sports League, ESL for short, is the best-known esports company, which organizes competitions around the world in all types of competitive games. The organization decided to start hosting leagues, leasing servers to competitors and providing platforms for players to compete with each other. Their services suddenly gained worldwide and hosted worldwide tournaments. It currently holds the largest number of users during their event on the Twitch.tv stream. It was the ESL Intel Extreme Masters in Katowice. Over 1.5 million spectators watched the tournament live. It is also the largest organization with the most game titles - 9. Each game has its own competition or tournament. That's why ESL also organizes world championships and major tournaments around the world, for the biggest game titles. Their prize pools here reach over $1 million (Hayward, 2019).

Figure 1. Logo ESL ONE (esl.com, 2022)

Dota 2

Computer game Dota 2 belongs to the genre MOBA (Multiplayer Online Battle Arena). This genre is one of the most popular genre, especially in Asian countries. The principle of MOBA games is very simple. Two five-member teams compete against each other, whose task is to eliminate or to destroy the enemy's main building. The map is divided into three lines, plus the space between the lines, the so-called jungle. There are towers on each line, which need to be gradually destroyed so that the team can get to the enemy base. At the beginning of the game, each player has the opportunity to choose their hero, who has unique abilities. Part of each team's strategy is to choose heroes who will work together and help each other with their skills.

League of Legends

Another very popular MOBA game is League of Legends (LoL). It is very similar to Dota 2, so it can be said that League of Legends is based on the mode in Warcraft 3. Games LoLs are usually shorter. Here, the player can choose from more heroes and a number of items that the character can buy than with the above-mentioned Dota 2. Therefore, League of Legends has become more popular with spectators and has a larger player base. Prize pools are not that high, mainly due to the absence of a system for collecting money for large tournaments, which has Dota 2 in the form of buying a Battle Pass by active players. Most of the most prestigious and well-known tournaments are covered by RIOT Games, which distributes the final worlds qualifications to the regions due to high demand and player base.

Counter-Strike: Global Offensive

Most of the population knows this legendary game under the acronym CS:GO. This is the successor to the older versions of Counter-Strike Source and Counter-Strike 1.6, which were among the most popular shooting games of their time. CS: GO is an FPS shooter that was created in 2012 and so far, it is the most played shooting game with a huge game base. The principle of the game is very simple. Two teams compete against each other, each with five members. One team is in the position of terrorists who are trying to place a bomb, and the other five players play as police officers who are trying to prevent the bomb from being dropped or to defuse the dropped bomb. One match is played for thirty rounds and the winner is the team that reaches sixteen points first. The match may end in a draw or set if it is a match played in a Robertson tournament or championship (2021).

3 Methodology and Objectives of the Work

In this part of the thesis, the work methodology and process is briefly described. The subject of research, data sources, used data collection methods and methods for creating the resulting forecasts are found here.

The master thesis deals with the historical development and forecast of the future state of electronic sports until 2030. The video game market, esports and their individual aspects are therefore analyzed. Aspects of the esports and video game markets that are tracked, analyzed, compared and predicted include viewership of the esports, the value of the video game market, the number of video game players, the number of active players, both professionals and amateurs, and the third aspect is the development of prize money from the biggest and most famous tournaments and the total number of esports tournaments held in one year. Last but not least, data from the Twitch.tv platform and data related to esports tournaments are also used.

The intent, therefore, is to analyze the esports market and elements of the video game markets, which will formulate a development growth forecast of this subsector. This master thesis work can then serve for potential sponsors, investors and companies interested in this market.

To fulfill the main goal, the author will try to compile a multi-level structure of the current esports environment. This structure will include the most important subjects of the esports environment that can currently be found on the Internet, so it is likely that the structure will not contain less important information.

The author will try to fulfill the sub-goals by means of an analysis of currently available information, which will be drawn mainly with the help of professional works available on the servers Newzoo, Statista, Twitch. In order to preserve the topicality and character of esports as such, electronic resources will be used.

In order to accomplish the goal of the master thesis, it is necessary to complete several sub-tasks related to this issue:

- Define the terms of esport market, gaming industry, progaming and other terms related to this topic,
- search for prognostic methods and select the one that will best suit the issue,

- obtain relevant secondary data to analyse developments, then analyse them using tables, graphs, figures and formulas in Microsoft Office Excel software,
- substitute values from formulas and functions from more available data indicators for more accurate predictions,
- demonstrate development and structure using scatter and bar graphs, to facilitate long-term development, present the resulting forecasts,
- compile sets of recommendations for entities interested in participating in esport market.

Research questions:

- What trends can be expected in the esport industrial segment?
- How will the current situation of esport evolve in the next couple of years?
- How attractive can esport be for potential investors?

3.1 Subject of Research

The master thesis deals with the historical development and prediction of the future state of electronic sports. Aspects of esports market and video game market that are monitored, analysed, compared and predicted include viewership, the number of active players, both professionals and amateurs, the third aspect is the development of prize money from the largest and most famous tournaments and the total number of eports tournaments held.

The focus of the master thesis is also to map the functioning of esports, to compare the functioning of individual organizations and even entire leagues. Furthermore, the goal is to show the size of esports, how big esports events are, and also which international companies and esports brands are supporting and trying to get into this industry. With all these statistics and information, it will be easier to make a decision for potential investors in esports market.

Partial goal of this master thesis is also to try to estimate future trends in the esports industry using the current state of the industry and current resources.

The author will try to fulfil the sub-goals by means of an analysis of the currently available information, which will be drawn mainly with the help of excel. Resources from Newzoo, Twitch.tv, Statista and others will also be used.

3.2 Sources of Data

According to Vaštíková (2008), we distinguish between primary and secondary data. Primary data is being collected anew because the issue has not yet been investigated. Secondary data has already been processed in the past and thus can be divided into external and internal data. The data used for this master thesis are drawn from reviewed, quality and verified Internet sources. The most used sources in this master are as follow - Newzoo.com presents itself on the Internet as:

> *"Newzoo is a global leader in gaming, esports and mobile intelligence with offices in Amsterdam, Shanghai and San Francisco. We provide our clients with a combination of market trends, financial analysis, revenue forecasts, consumer knowledge, data modelling solutions and predictive analytics services across all continents, screens and business models. We are proud to work for most of the world's top gaming and esports companies, along with many independent game developers and the world's leading technology, Internet and media companies"* (Newzoo.com, 2022).

German company Statista is one of the world's biggest and largest statistical portals, containing over 1.5 million statistics, forecasts, tables, figures, documentation, reports and infographics. All this on more than 85,000 topics and from more than 22,500 sources and 185 different industries. The platform combines not only data, but also various surveys, consumer findings or demographic trends (Statista.com, 2022) and Deloitte is:

"A brand that brings together tens of thousands of specialists in independent companies around the world and provides selected clients with audit and verification services, consulting, risk management and financial consulting, taxes and related services" (Deloitte, 2022).

Due to the excellent reviews and worldwide operations, these companies are used, which have the latest and most accurate data needed to process the master thesis. Internet resources are also used in this work. Thus, secondary, external data are used, which can be found on the official websites of the researched game titles, quality data companies and in professional articles. Audience data is drawn from the statistical page of the largest streaming platform Twitch.tv. This website is called Twitchtracker.com. Other sources for obtaining esport viewership data are to use the largest video sharing internet server, Youtube.com, then Steamcharts.com and Escharts.com.

Due to the collection of data from multiple sources, the data are compared, averaged and fitted into functions and formulas for more accurate identification and then implemented in a suitable prognostic method.

3.3 Forecasting Methods

We can determine the prediction for future phenomena from the analysis of past phenomena. Generally, this procedure is called prognosis. The subject of forecasting is the search for information, experiences and ideas about the future, which are obtained through rational procedures and logical considerations. In master thesis will be used these methods to predict the development of electronic sports. At the same time, the forecasts already made in the past will be compared with each other, or their accuracy will be commented on with the help of qualitative methods (Štědroň, 2012).

We divide prognostic methods into two main categories. Those that are based on experience and knowledge are called qualitative prognostic methods. On the other hand, there are quantitative forecasting methods, which originate from the analysis of value indicators of past development and are based purely on historical data. The probable development for the future is then calculated from them (Hendl, 2008).

3.3.1 Qualitative Prognostic Methods

One of the best known and most widely used methods is brainstorming. It is a method that is characterized by trying to gain as many ideas as possible to deal with a given problem or forecast. For most of this time, experts on the topic are assigned to each other, who mutually evaluate and discuss key issues and try to find the most appropriate solution (Štědroň, 2012).

A more widespread and sophisticated option is the Delphi method, which is based on a panel of experts. They differ only in anonymous communication between experts. This is because the communication of information only leads to arguments for the given scenarios (Štědroň, 2012).

The last of the qualitative methods is the analogy method. It is especially suitable for technological problems. It is based on the law of similarity of the observed phenomenon with the phenomenon that took place in the past and its data and processes are known to us. It is acceptable to look for connections between the analogy of process development and another process, or to observe the analogy of the system under study with the basic birth system. With this method, it is especially important to follow the rules and exercise caution. The results of experts can then be easily manipulated and very variable (Štědroň, 2012).

3.3.2 Quantitative Prognostic Methods

Time series analysis is one of the best-known quantitative methods. Time series are chronologically arranged values of the studied phenomenon, from which we are able to deduce further developments in the future. They are divided into deterministic and stochastic. Deterministic series do not include a single random element and it is therefore permissible to predict them with 100% probability. However, these series are not so easy to find in the real world, which is why most time series are stochastic. This means that they involve a certain degree of randomness and thus reduce the probability of a correct estimate. Therefore, these series cannot be described with 100% accuracy, and therefore the predictions themselves cannot be exact (Vojtíšek, 2012).

The values contained in the time series are divided into absolute and relative. Absolute values are the original units that have been measured or observed. On the other hand, relative values are those units that have been calculated or calculated from absolute values. Another division of time series is according to the time interval – instantaneous and interval. Where the instantaneous values of the time series represent the state at one moment, for example, the value of money in the cash register at a certain date (Štědroň, 2012).

The key point of the time series analysis is the arrangement of the time series model, from which we use to generate the future value using the calculation to create a forecast. At the same time, it is necessary to verify the validity of these obtained data. The time series decomposition method is most often used for the possibility of time series analysis, which expects the time series values to be combined from several independent sources (residual, trend, cyclical or seasonal). The residual component is composed of random non-systematic fluctuations. The trend or main component could be seen as mathematical with the expression of long-term changes in development. Cyclical, on the other hand, is difficult to quantify because it contains signs of variable amplitude and expresses an increase or decrease in the observed value (Vojtíšek, 2012).

If we use the quantitative method and the qualitative method at the same time, and combine both approaches, it is a trend and impact analysis. This enables us to extrapolate individual data similarly to the quantitative method, but at the same time it expands and takes into account expected future events or factors as in the qualitative part (Mallya, 2007).

3.3.3 Logistics Function

According to Hosmer (2000), the logistic function is increasingly used to describe the properties of different modern technologies. It originally functioned as a means of displaying growth – this is a growth model (e.g. world population growth). At the beginning of the function we observe exponential elements, and later the growth slows down until it is equal to zero. The expression of the logistic function is then:

$$f(x) = \frac{\mathrm{k}}{1 + a.b^{x}}$$

where x represents the independent variable. Variables k, b express real parameters (k is greater than 1, b – is in the interval <0;1>). In further forecasts, the author will use this definition of the logistic function.

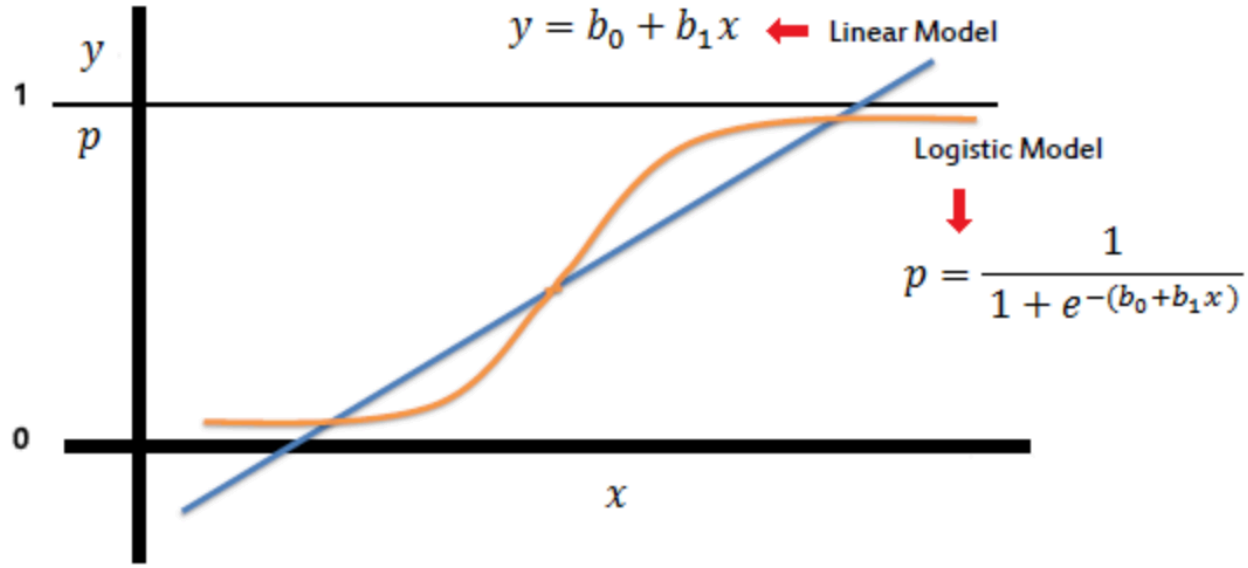

Figure 2. Logistic Regression (saedsayad.com, 2022)

Two of the most well-known machine learning algorithms are linear regression and logistic regression. Both algorithms are used to predict a labelled data set. The main difference between linear and logistic regression is the use case. Logistic regression will be used by the author to solve classification problems, while linear regression will be used to solve regression problems (quantification). The author will use both methods in this master thesis. It uses independent variables to predict categorical dependent variables. At the same time, it is based on the concept of maximum likelihood

estimation. Estimated data should be the most accurate and most likely. The graphical result is known as an s-curve, after its s-shaped curvature (Hosmer, 2000).

Several methods can be used to estimate the parameters of the logistic function. The first option is the method of partial sums, where the described time series is divided into three groups of the same amount and length m. We assign their sums to these groups, indexed as S1, S2, S3. If the time series cannot be divided into three groups of the same size, then the latest and oldest monitored data are usually omitted. Thanks to the method of partial sums, the individual parameters are subsequently estimated using the following relations: (Hosmer, 2000)

$$b = \sqrt[m]{\frac{S_3 - S_2}{S_2 - S_1}};\ \frac{a}{k} = \frac{(b-1)(S_2 - S_1)}{b(b^m-1)^2};\frac{1}{k} = \frac{1}{m}\left(S_1 - \frac{ab(b^m-1)}{b-1}\right)$$

3.3.4 Quality of Time Series Approximation by Trend Function

A trend function is a very similar mathematical model based on a real-time series. We can evaluate the value of the time series estimate by the modelled trend function thanks to various mathematical criteria. One of these criteria is the coefficient of determination – R2. It takes on values from zero to one inclusive. And the larger it is and the closer it is to one, the more accurate the trend function is and the better it approximates the time series (Hindls, 2000).

Considering that Microsoft Excel favors the coefficient of determination, it was appropriate for me to choose it as a criterion for the shifted exponential as well.

The basic form for the coefficient of determination expresses:

$$R^2 = \frac{S_T}{S_y} = 1 - \frac{S_R}{S_y}$$

It says that the total sum of squares of the deviations is the sum of the residual and the theoretical sum of squares. We express this rule as:

$$S_y = S_t + S_R \ or\ also\ S_y = \sum (y_i - \bar{y})^2$$

Then the theoretical sum of squares can generally be expressed as:

$$S_T = \sum (Y_i - \bar{y})^2$$

And the residual sum thus as:

$$S_R = \sum (y_i - Y_i)^2$$

The coefficient tells how much variability of the dependent variable was able to be expressed by the variability of the independent variables thanks to the selected dependency (Hindls, 2000).

Time series analysis

We include time series analysis among the most well-known quantitative methods. Time series are chronologically arranged values of the investigated phenomenon, from which we are able to deduce further developments in the future.

Hindls (2006, p. 246) in his book defines time series as:

> "*A sequence of objectively and spatially comparable observations (data) that are clearly arranged in terms of time in the direction of past - present. The analysis (and, if necessary, the forecasting) of time series is then understood as a set of methods that serve to describe these series (and possibly to predict their future behavior).*"

Time series can be classified according to various criteria. Štědroň (2012) divides time series into stochastic and deterministic depending on randomness or non-randomness.

Deterministic time series do not include any random elements and can therefore be predicted with 100% accuracy. In reality, however, it is very difficult to find these series, which is why most time series are stochastic, and it is these stochastic series that will be used in this thesis. Stochastic series can contain a proportion of random elements. The values that time series contain are divided into absolute and relative. Absolute values are the original units that were measured or observed. On the other hand, relative values are units that have been calculated or added from absolute values.

Another important division of time series is by interval. According to this criterion, we distinguish between interval and instantaneous time series. Interval time series contain values from a certain period of time, and momentary values are based on one specific data - for example, the number of visitors to one specific match (Štědroň, 2012).

Time series problems

Like any research method, the time series method has its own problems and shortcomings. The first common problem is related to the calendar year. This means that if we take, for example, monthly data, holidays and weekends fall on a different day of the year every year, which can affect our data. With annual values, it is even more noticeable, due to the existence of a leap year.

The second problem is determining the optimal number of time series values. If we choose too many or, on the contrary, too few values, it will bring calculation problems. We must therefore always find a suitable compromise between these poles (Štědroň, 2012).

The last problem mentioned in this work is the length of the time series. If we choose a horizon of, for example, fifty, one hundred or even one hundred and fifty years, there is a high probability that fundamental changes took place during this time, which greatly influenced the values, which became incomparable in the long term as a result (Štědroň, 2012).

Analysis of the development of time series

Štědroň (2012, p. 52) states:

> *"The basic task of time series analysis is the effort to understand the principle of generating the values of a given time series. This effort is motivated by the hope that, based on the knowledge of the mentioned principle, it will be possible to extrapolate the future values of the time series, or to predict its future development. From the results of the analysis, it is then possible to predict to a certain extent the future behavior of the system that the time series describes. In some cases, the results of the analysis may also enable the control and optimization of the system to a certain extent, e.g. by a suitable choice of input parameters and initial conditions."*

This principle of generating time series values is called a time series model. Currently, there are a large number of approaches and models for time series analysis. According to Štědroň (2012), the choice of a suitable model and approach depends on the type of time series, the purpose of the analysis and the analyst's skills. Among the most used methods of time series analysis are the following four:

- Time series decomposition,
- box – Jenkins methodology,
- spectral analysis of time series,
- linear dynamic models.

3.3.5 Confidence interval

Confidence intervals are ranges of estimates for an unknown parameter that contain an associated confidence level. The 95% confidence level is most commonly used, but we can encounter 90% or 99% values. These levels represent the long-run frequency of the confidence intervals containing the true value of the unknown population parameter. Several factors influence the resulting range of the confidence interval itself. First of all, it is the level of reliability, then the size of the monitored

population (sample) and, among other things, its variability. The greater the variability of the observed population, the less reliable the confidence interval will be. On the contrary, the more homogeneous the population is, the more reliable the confidence interval will be and, overall, a better estimate of the investigated parameter (Hindls, 2000).

If we use a confidence level of 95%, this means that if we measure 100 independent data sets on which we estimate an unknown parameter with a confidence interval, then about 95 intervals will contain the sought parameter and about five will not. This is sometimes expressed by the simplified statement that "*the unknown parameter lies in a confidence interval with 95% probability*", which, however, is not correct from the point of view of the classic "frequentist" theory of probability, since after determining the confidence interval, the unknown parameter either lies in this interval, or it does not. However, one cannot talk about the probability of a phenomenon that has already occurred or has not occurred (Hindls, 2000).

3.3.6 Regression Techniques

In this thesis, the author will measure the dependence of the variable y on one or more independent variables. The author will set the values of the independent variables fixed. The measured values of the dependent variable show certain deviations - fluctuations (usually with a large share of experimental error) around an unknown mean value.

The author will use the dependence of the variable y on one independent variable x and will perform n measurements. We thus obtain the points (xi,yi), i=1,2,...n. Let's assume that our measured dependence is mathematically formulated by a well-known law - the equation y=f(x). The function f is a regression function.

The author will interpolate the regression function with the measured data in such a way that we minimize the aforementioned data fluctuations with our interpolation. At the same time, the author will determine the estimate of the unknown parameters of the regression function. In other words, the goal of regression is to determine the parameter values of the regression function so that this function fits the given data as well as possible.

In this master thesis, the author will use Excel, which already includes tools that calculate these parameter values, for regression functions linear with respect to the parameters. It uses the method of least squares for this, of course. After obtaining estimates of the regression parameters, the corresponding estimate of the dependent variable y can be calculated from the regression function,

after entering the value of the independent variable x. We call the described calculation a prediction.

LINTREND Function

The function creates a forecast of future development based on fitting the points using the straight line least squares method. Simply put, known data (the past) directs us in a straight line to the future.

The Lintrend function is suitable for predicting (estimating) already established situations. It is definitely not suitable for predicting, for example for the implementation of a brand-new product to the market. However, the Loglintrend function is suitable for this. This is because the Lintrend function is a linear function. Therefore, it is suitable for predicting, for example, the sales of an established product that has already established itself on the market and has been sold for a long time.

LOGLINTREND Function

The function creates a forecast of future development based on fitting the points using the straight line least squares method. Simply put - known data (the past) directs us in a straight line to the future.

The future prediction of the Loglintrend function is based on exponential growth. Exponential growth is much larger than the linear growth that the Lintrend function is based on. It is precisely in the size of the growth that the two functions fundamentally differ. Therefore, it is important to remember in which cases the Loglintrend function can be used. The resulting differences in the forecast of, for example, can be enormous.

$$y = b * m^x$$

3.3.7 Creating a Forecast in Excel

The author will use already historical known time-based data to create a forecast. Using the prediction function, Excel creates a new worksheet. This worksheet contains a table of historical and predicted values and a graph that represents the data. The forecast will help to the author to predict things like future viewership trends, watched hour trends, player trends.

Start of Forecast:

The author will select a date to start the forecast. If the selected date will be before the end of the historical data, only the data before the start date will be used for the forecast (sometimes called "backward forecasting").

Confidence Interval:

The confidence interval is the area around the individual predicted values in which, according to the forecast (with a normal distribution), 95% of the future points should fall. A smaller interval means more confidence in the forecast for a particular point. The default confidence level is set to 95% and can be adjusted if necessary.

Seasonality:

Seasonality determines the length of a seasonal pattern and is recognized automatically. For example, in the annual purchasing year, where each point represents one month and the seasonality is 12. The author can also set automatic recognition manually and select the necessary number.

Timeline Range:

It is an indication of the length of the timeline and the author can adjust it according to the data required for the timeline.

Aggregate Duplicates Using:

If the data contains multiple values with the same timestamp, Excel averages the values. The author can also use another calculation method, such as Median or Count.

Include Forecast Statistics:

Here the author can select the option to include additional statistical information about the forecast on the new sheet. This adds a table of statistics generated by the FORECAST function and it includes measures such as smoothing coefficients (Alpha, Beta, Gamma) and error metrics SMAPE (Symmetric Mean Absolute Scaled Error), MASE (Mean Absolute Scaled Error), RMSE (Root Mean Square Error) and MAE (Mean Absolute Error).

3.3.8 Calculating the Compound Annual Growth Rate

Compound Annual Growth Rate (CAGR) is a growth indicator that measures the rate of return on investment over the duration of the investment or the rate of appreciation of the investment. It is a geometric indicator of the average growth rate.

CAGR is typically used to measure the growth of an investment. It is used for investments that are longer than 1 year. It is one of the main numbers that is considered when analysing securities. The indicator tells how an investment would grow at a steady rate (or grow) over its lifetime. Its advantage is that it takes into account the overall trend over several years - that is, it filters out annual fluctuations and helps assess annual revenue growth. It therefore smooths out fluctuations (so-called volatility). This makes it possible to compare investments or investment opportunities with each other. (Anson, 2010)

$$CAGR = \left(\frac{Ending\ value}{Beginning\ value}\right)^{\left(\frac{1}{\#\ of\ years}\right)} - 1$$

CAGR is actually the geometric mean of the calculated values. Compared to the mathematical average, it has the advantage that it does not overestimate the actual average annual rate of return, as it takes into account the total duration of the investment (e.g. 5 years). It thus smooths out possible fluctuations (volatility) during the duration of the investment (Anson, 2010).

3.4 Analysis of Data

The analytical part outlines the analysis of the esport market using secondary data. Statistical functions and comparative methods are used for data processing. Most of the data came from multiple sources, so it was necessary to average this data using the weighted average method. To clarify the historical development and the current state, the results are shown in graphs. When retrieving data from multiple sources, the data was averaged and graphs were subsequently created in Microsoft Excel. Most of the used data in this work are from years 2012-2020, some of the graphs are made even with longer history as it was available from Newzoo and Twitchtracker.

The most used and highest quality data sources used in this master thesis are from Newzoo, Twitchtracker, Escharts and Statista. Secondary data from high-quality and verified internet sources are mainly used. The topic itself is very focused on the online world, so most of the data can be found online.

The absolute most used site in this work is Newzoo. The site provides a mix of consumer statistics, market trends, financial analysis and predictive analytics services around worldwide. They provide their data to users in abbreviated versions for free, or complete analyses, statistics, etc. for a small monthly fee (Newzoo.com, 2022).

Another site mentioned is Twitchtracker, which serves to provide all data from the Twitch.tv platform. Here we can find historical data about the platform itself, such as the number of channels broadcasting simultaneously, the average number of viewers or other statistics such as the number of hours watched per day etc. Furthermore, there are statistics of individual streaming channels, which can be divided according to nationality, channel type, the order is determined by Twitchtracker.

3.5 Results

The resulting forecasts will be made by using forecasting methods. After a thorough search of qualitative and quantitative methods, the one that best corresponds to the researched issue will be selected. This method is a time series method. This method was also used for this reason, because the master thesis analyzes year-on-year data that show annual growth and are in most cases easily comparable. According to Hindls (2006), time series are factually and spatially comparable data that are clearly arranged in time. Interval time series are used, because year-on-year data are mostly used in the analytical part. The individual time series are analysed and further presented mainly using tables, figures and graphs in the Microsoft Office Excel software program. This method assumes that the number of players cannot grow every year and the total population in the world is a limiting factor. A logistics function approaching zero will be used. At the end of the master thesis will be an evaluation of these forecasts and three possible scenarios compiled. Basic, pessimistic and optimistic, which predict the development of the esports market under certain conditions and circumstances.

3.6 Validity, Reliability and Ethics

Validity

In the case of diagnostic tools, validity is the degree of agreement between the information obtained (e.g. measured results) using the given tool and what we intended to measure with the given tool. In psychology, the subject of this measurement is usually some construct, property or characteristic (e.g. emotional intelligence, trust, impulsivity, etc.), which we assume exists in some way and can

be measured, and therefore quantified - converted into numerical values within the measurement values. A valid diagnostic tool then provides information about this construct that corresponds to reality (Coolican, 2009).

Simply put, validity determines the extent to which a given diagnostic tool actually measures what it is supposed to measure or what it claims to measure, and to what extent this measurement corresponds to reality, i.e. how it is with the given measured characteristic or construct in reality. In the case of research projects, validity means the extent to which conclusions based on a given project (e.g. an experiment) can be considered valid, scientifically based and corresponding to reality (Coolican, 2009).

At the same time, there are newer definitions of this term that specify the meaningful value of information or conclusions obtained on the basis of a given diagnostic tool or research project. The emphasis here is on the fact that the information or conclusions obtained in this way always represent our certain interpretations, i.e. the interpretation and understanding of the relevant measured values. These definitions emphasize the course of the validation process (i.e. the process of establishing the validity of the given method), during which individual evidence is obtained to support the validity of the given method, rather than emphasizing the conclusion of this process, i.e. a clear result indicating the degree of agreement between the conclusions obtained by the given method and what we wanted to measure (Urbánek, 2011).

The following definition can be given as an example. Validity represents the degree to which empirical evidence and evidence based on theoretical conclusions support the interpretation of information or conclusions (e.g. measured results) obtained through a given method, namely the interpretation in the sense that the given method actually obtains information about the given measured construct, about reality - while we assume that this construct corresponds to some entity existing in reality (Urbánek, 2011).

Reliability

Reliability, one of the basic requirements or properties of the measurement (complementary to validity), expressing its accuracy in the sense of constancy, the absence of errors arising from repeated measurement of the same phenomenon under the same conditions. From the point of view of the dispersion of the measured values, it is a matter of minimizing random errors (not systematic

errors). Fluctuations in the measurement result (e.g. in tests) can be influenced by many circumstances: the filling situation, the accuracy of the instructions, practice, changes in the motivation of the examined person, errors in the evaluation of the test (Coolican, 2009).

R. can be expressed as a "reliability coefficient", which is the proportion of the correct variance out of the total. In research practice, the given coefficient is derived from the correlation between two series of measurements. It then depends on which form of r. we want to find out: we verify stability by repeated measurements on the same set after a certain time (retest), consistency in several ways, e.g. by pairing items, splitting the test in half (split-half). Although it is generally true that a larger number of individual items increases the total r. of the measured variable, it may happen that, for example, as a result of fatigue, some of the examined persons achieve worse results in the second half of the test (Urbánek, 2011).

Since the source of errors can also be the person of the observer, the methodology also deals with intersubjective reliability, when the agreement of the recording between two or more observers of the same phenomenon is examined (it is also important for content analysis). An interpretation year is also considered, both at the level of comparing statistics. data (tables, etc.), as well as within qualitative methods. Knowledge of the r coefficient allows for indirect measurement to determine the confidence interval of the estimate (e.g. when determining the intelligence quotient). The comprehensive assessment of the year represents a very demanding task, as it is intertwined with the basic research operations, with operationalization, standardization, statistical selection (Urbánek, 2011).

Ethics

The ethics of science and research is a special applied discipline dealing with the morality of science. Its basic role as part of meta-science is to reveal ethical problems related to scientific activity and its consequences. It critically examines and justifies the norms that regulate the behavior of scientists. Ethics is a philosophical science of morality, it has many different schools of thought, some of which are based on human pre-understanding of morality. Human misunderstanding is determined by the biopsychosocial nature of man. That which distinguishes good from evil in a person and directs the behavior and actions of a certain person accordingly is called conscience. Conscience, however, varies among individuals in terms of content and scope. Ethics affects many fields of human activity (applied ethics) and one of them is the ethics of science and research. Here too, as in the

entire field of ethics, two basic ethical principles apply - to do good and not to do evil. We can approach specific actions based on these principles from the point of view of performing an obligation or from the perspective of acting according to the consequences of actions. The most famous theory based on the consequences of actions is called utilitarianism. In science, the principle of doing good is called beneficence and not doing evil is called nonmaleficence (Fobel, 2002).

3.7 Quality assessment

Critical evaluation of studies is another important step in the process of creating a systematic review. The goal of critical evaluation is to exclude studies that are or may be burdened by systematic error (distortion) or misleading factors (bias, confounding). Esports is a relatively young industry and therefore, does not have as many sources as in other areas. It is necessary to filter those sources that address either the same issue or only basic aspects of esports. For this master work, studies were used that looked at the research questions, which were selected from a unique or interesting point of view. The author also decided to exclude studies where it seemed, that the authors understood the research, but were not well versed in the esports environment, so they could be unintentionally making up stories (Klugar, 2015). When evaluating whether the work is of sufficient quality to be included in the esports environment, the author mainly based it on how well and up-to-date the research materials are.

4 Market Analysis

In the next part of master thesis, the author will analyse step by step the various aspects and parts of the esport market that are the key to understanding and basic market overview. In the next chapters, the author will use those for its prediction. The individual subchapters describe the key areas of the market and expand the theoretical description from the previous chapters. As far as possible, professional studies and surveys, or statistical data from credible servers and media are also drawn.

There are two key factors that play a key role in analysing the esport market. Firstly, it is based on the global nature of the market and, secondly, it is a digital product in almost the entire spectrum. As much as 80% of revenue here is made up of software (Mazique, 2018). Both the development of the Internet and digital distribution have contributed to the possibility of buying a game from the comfort of your home in a matter of minutes. The negative obstacle here is just the legislation of individual states. In China, for example, certain games are banned or under strict censorship. For this reason, in the following analysis, the author would rather stick to a global scale with a potential warning and description of differences related to a given country, continent or culture.

The analysis starts with more general and global market indicators. These include: market size, number of players, popularity, trends. Subsequently, an analysis of the demographics of players and the distribution network is described. The last point of the market analysis will be crucial for us - esports (sales, prize pool, investments). All the analyzes that will be performed will then serve as a basis for subsequent prediction.

In order to analyse the market environment, the author will gradually relied on an analysis of the main factors of the esport market and key indicators, which were sought from specific data, research and statistics. However, the most helpful thing for me is Newzoo.com, which was willing to provide most of the data. The individual parts of the analysis are selected with regard to the development and current state of the market. As a result, professional market analyzes, professional literature and my own experience, together with the data, will provide me with a comprehensive picture of the current state of the esport market and an overview of its main aspects. This will be used in the next part of the master thesis, both to summarize and, above all, to predict future developments and to describe critical market components.

At the same time, by covering most of the important economic factors and indicators of the industry (size, dynamics, demographics, investment indicators), it can serve potential investors who would like to penetrate and invest in a certain esports team, game or itself players.

4.1 Gaming Industry

In the master thesis work, the author has already described the game industry's history in the first chapters. So, let's take a look at the statistics of the gaming industries in the recent past and present. The next figure shows worldwide growth in the video game markets by region in percent and in billions of US dollars. In the figure, we can see that Asia and the Pacific have the largest global market share at 50%. Right behind them are North America with 24% and Europe with 18%. This figure is of course affected by the global pandemic of the covid-19 disease. According to the figure's author, Tom Wijman (2021), China and the Pacific were the least affected due to the massive mobile gaming market, while North America came in second due to the large concentration of the video game console market.

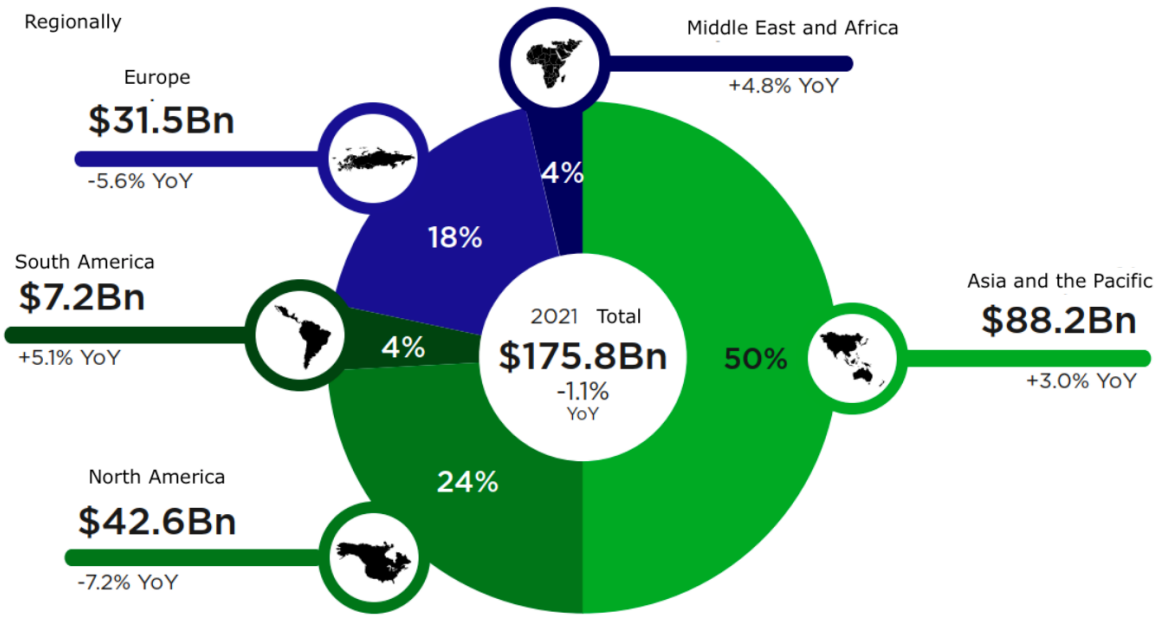

Figure 3. Global video game market 2021 (Newzoo.com, 2021)

To get a closer look at these regions, the author will show a table of the top ten countries/markets by game revenue. Leading the table is China, which has a very widespread mobile gaming market, as discussed in the previous figure. On second place is the United States of America, and on third

place is again an Asian country, namely Japan. These three countries lead this table. The difference between third and fourth place is USD 14.5 billion.

Table 1. Top 10 markets by video game revenue 2021 (Newzoo.com, 2021)

	Market	Revenues in USD	Players
1.	China	46.01B	685.48M
2.	USA	40.54B	191.12M
3.	Japan	22.09B	75.62M
4.	South Korea	7.55B	33.01M
5.	Germany	5.87B	46.12M
6.	United Kingdom	5.31B	37.66M
7.	France	4.13B	38.08M
8.	Canada	3.69B	20.98M
9.	Italy	3.29B	36.55M
10.	Spain	2.33B	29.73M

The following figure shows the global number of players by region. As you can see, Asia and the Pacific is again in first place with 50%. However, it is relatively even on the other ranks. According to the author of the article, Tom Wijman (2021), the growing number of gamers is due to the growth of online users due to better availability of smartphones, better internet infrastructure and internet data connections. With the development of esports, the appetite of players to become a professional esports player in order to make a living from the games and the events surrounding them is also increasing. According to Statista.com (2022a), the number of active esports players in 2021 is the United States, followed by China, Russia, France and Germany. Some schools now offer esports as a scholarship program. This is most widespread in the United States of America.

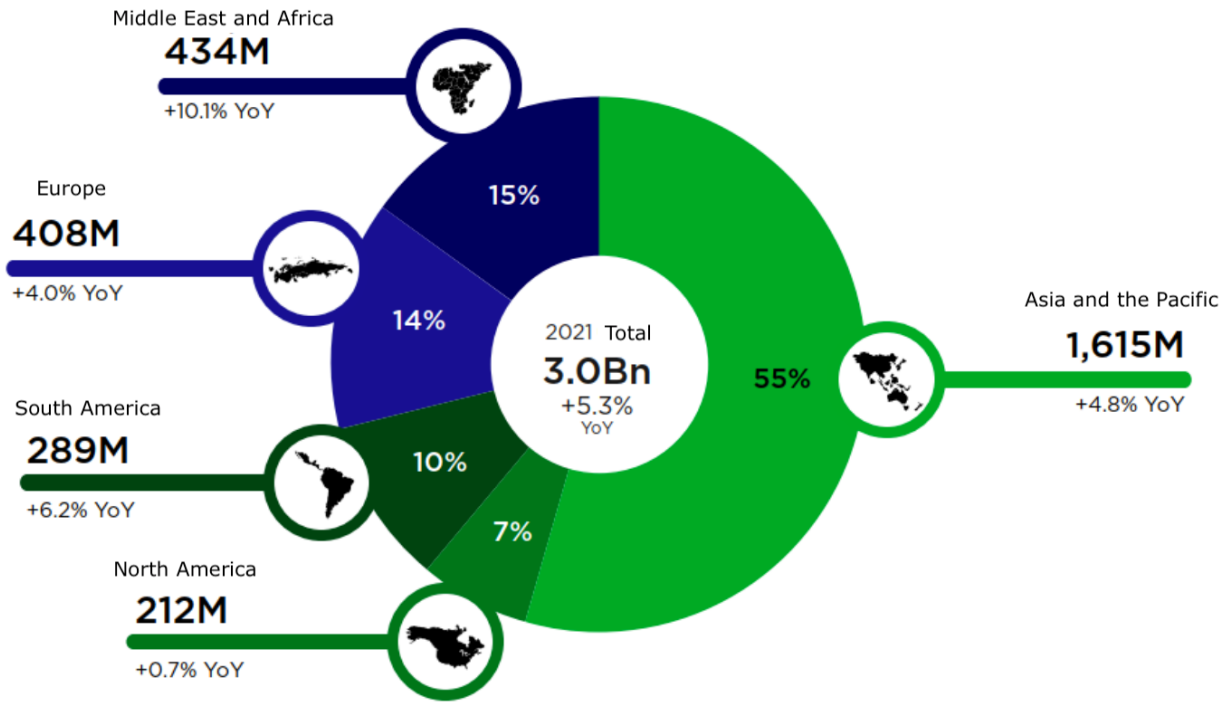

Figure 4. Number of video game players worldwide 2021 (Newzoo.com, 2021)

While they say gaming is only for kids, the data says otherwise. Games are also designed to appeal to a certain age group. Each game always has a recommended age and a warning if the game contains violence, blood, profanity or sexual content. However, this age is only recommended, so anyone can play the games, without age restrictions. However, a large number of games are developed to appeal to as many age groups as possible and can be played by anyone. According to Newzoo (2021), video game players are on average 43% female and 57% male. However, most women are so-called “popcorn” players, which means that they watch more game videos and the events surrounding the games than actually playing the game itself. Among men, there is the largest percentage of so-called “ultimate” gamers, who have maximum enthusiasm for games and how they play games, buy them and also watch everything that flashes around games (Bosman, 2021).

Another very important graph is the revenue of the worldwide video game market by game console. At the forefront are mobile games, which have seen tremendous growth in recent years. Again, the covid-19 disease has a big impact on this indicator, due to which there were problems with the supply of components and production restrictions due to infection, especially for console and computer manufacturers, which form larger teams than mobile game developer teams. All releases of new components or consoles had to be postponed. Cell phones that can play video games are more affordable than the latest game consoles or computers that can run the games you want. The price

of games on individual platforms is also an influencing factor. Newer game titles on consoles are around 60 to 80 euros, on computers the prices are around one 40 to 60 euros, but on mobile phones the games are mostly free, at most there are micro transactions through which the player can make the game easier, buy visual accessories or remove ads (Statistics&my, 2022).

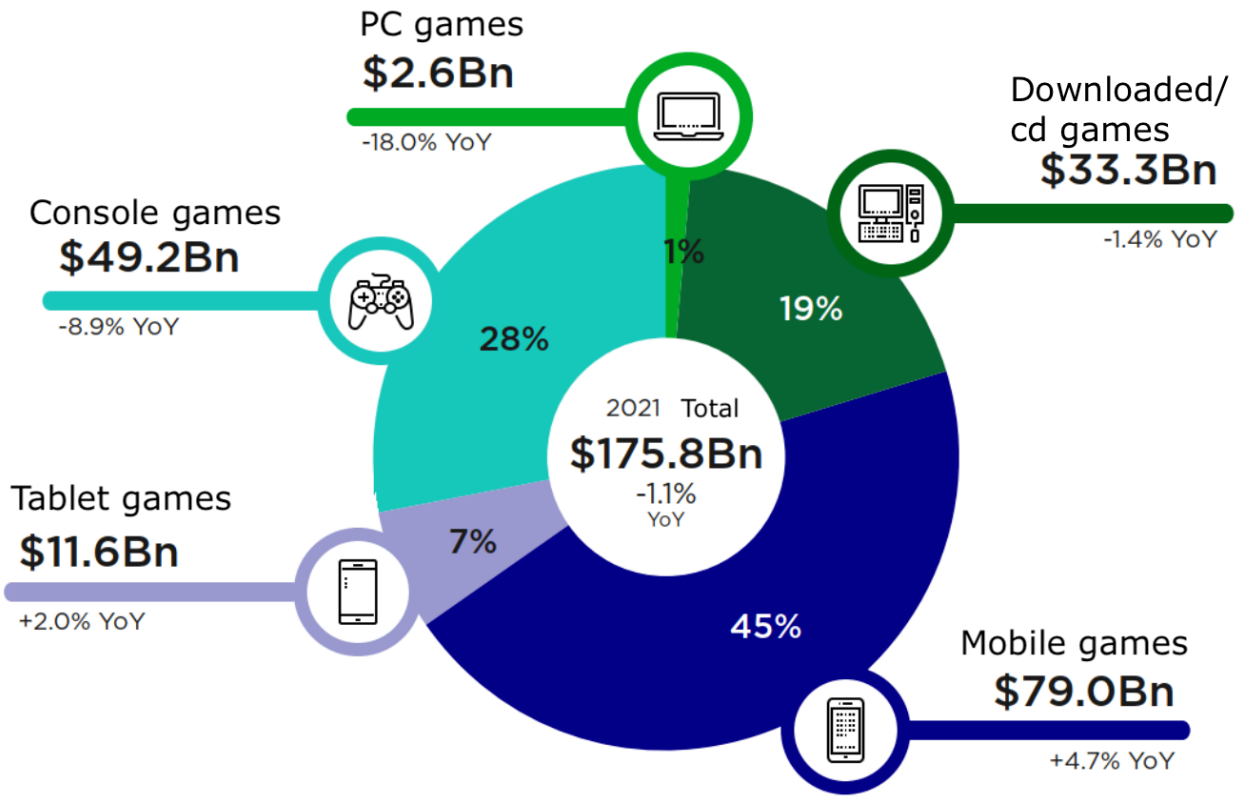

Figure 5. Global video game market by gaming device 2021 (Newzoo.com, 2021)

An integral part of the esport industry are the video game developers who are behind the creation of the games that players play. Together, these firms would generate $166 billion in 2020 revenue. This represents an impressive 23% year-on-year growth and represents 94% of the gaming market's revenue in 2020. This indicates a successful year for the larger companies. The largest company on the market is the Chinese company Tencent, which owns RIOT games. Tencent amassed $27.4 billion in gaming revenue last year, nearly $10 billion more than the second-largest company by revenue, Sony (Wijman, 2021). Following table shows exactly the top ten public companies according to revenue from games, as well-known companies such as Bandai Namco, Square Enix, Konami or Ubisoft are not even part of this ranking and can be found from position 11 and lower.

Table 2. Top 10 public companies by gaming revenue 2021 (Newzoo.com, 2021)

	Company	Revenues in USD
1.	Tencent	$8,299M
2.	Sony	$4,342M
3.	Apple	$3,610M
4.	Microsoft	$2,887M
5.	Google	$2,823M
6.	NetEase	$2,435M
7.	Activision Blizzard	$1,921M
8.	Nintendo	$1,589M
9.	Electronic Arts	$1,826M
10.	Take-Two Interactive	$858M

4.2 Demographic Overview

In past years, there was an opinion in society and in the media that video games are the prerogative of teenagers or children from the age of 12. It was mainly male who had nothing else to do but sit in their room in front of the PC and play video games. That has already passed, because with the development of the Internet, new technologies, smartphones, multiplayers and overall newly conceived gaming, it has become a fun activity for almost everyone. The choice of games is so large that everyone chooses their own. People now not only have fun, but also learn, fill their free time, relax or even work. It is precisely the great variety of games that is responsible for the sharp increase in players and the video game market itself. The list of data that the author will explain in the next chapters has already changed the stereotypes about the habits of players and their demographic indicators (Newzoo.com, 2017b).

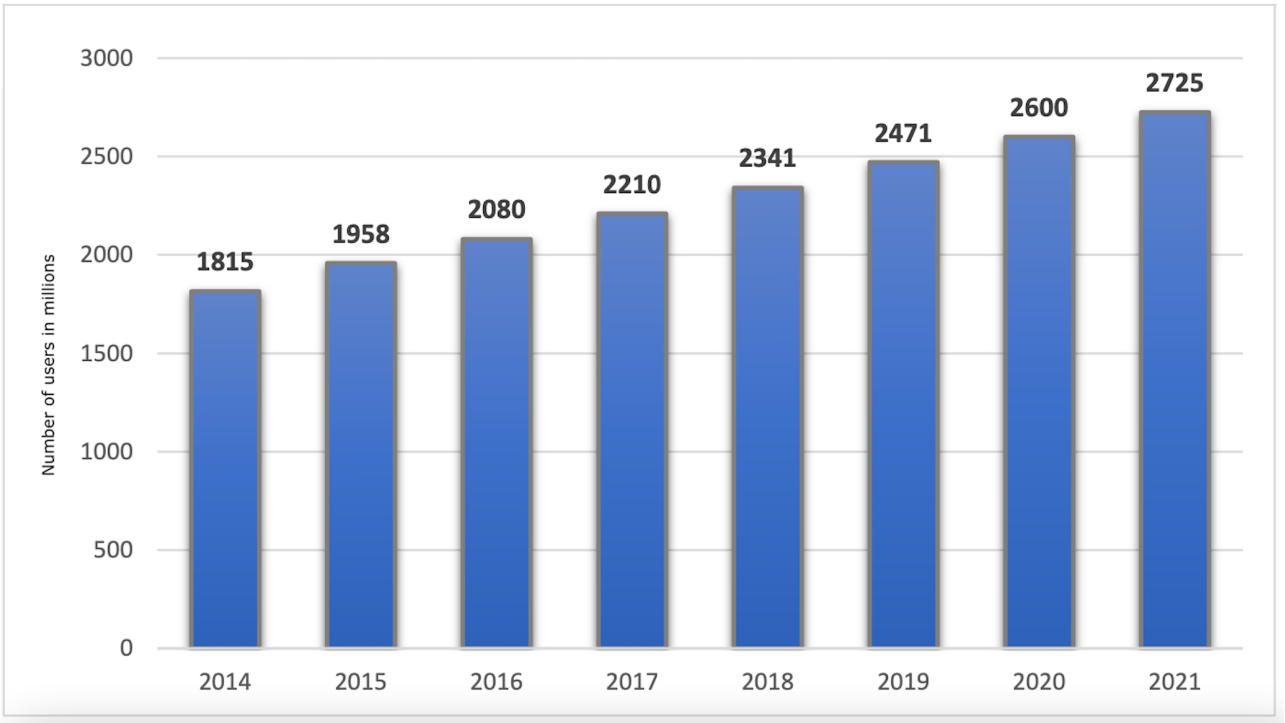

Figure 6. Worldwide number of video game users (Mmogames.com, 2021)

As we found out above, with innovations, new technologies, and mainly thanks to mobile phones, playing games has indeed become a widespread activity. We can support this with a study by Mmo-games.com (2021), which corresponds to figure above. The trend is still increasing. This year in 2022, there are approximately 2.9 billion users worldwide. Almost half of them come from the Asia and Pacific region. A little bit less than half million users is in the United States and another 350 million users in Europe. The rest corresponds to the rest of the world. According to Newzoo (2021) detailed demographic distribution of video game users can be found in the following figure. From it, we can read the distribution of players according to individual platforms, gender and age as of 2020. For Mobile, it is 74% to 26% in favour of men. On consoles, this difference is slightly smaller, 65% to 35% in favour of men and the almost even statistics are represented by PC devices with a split of 58% to 42%. The age group in both cases, for both men and women, is led by ages between 21 and 35 years. The oldest people from the age of 51 and over play the games the least.

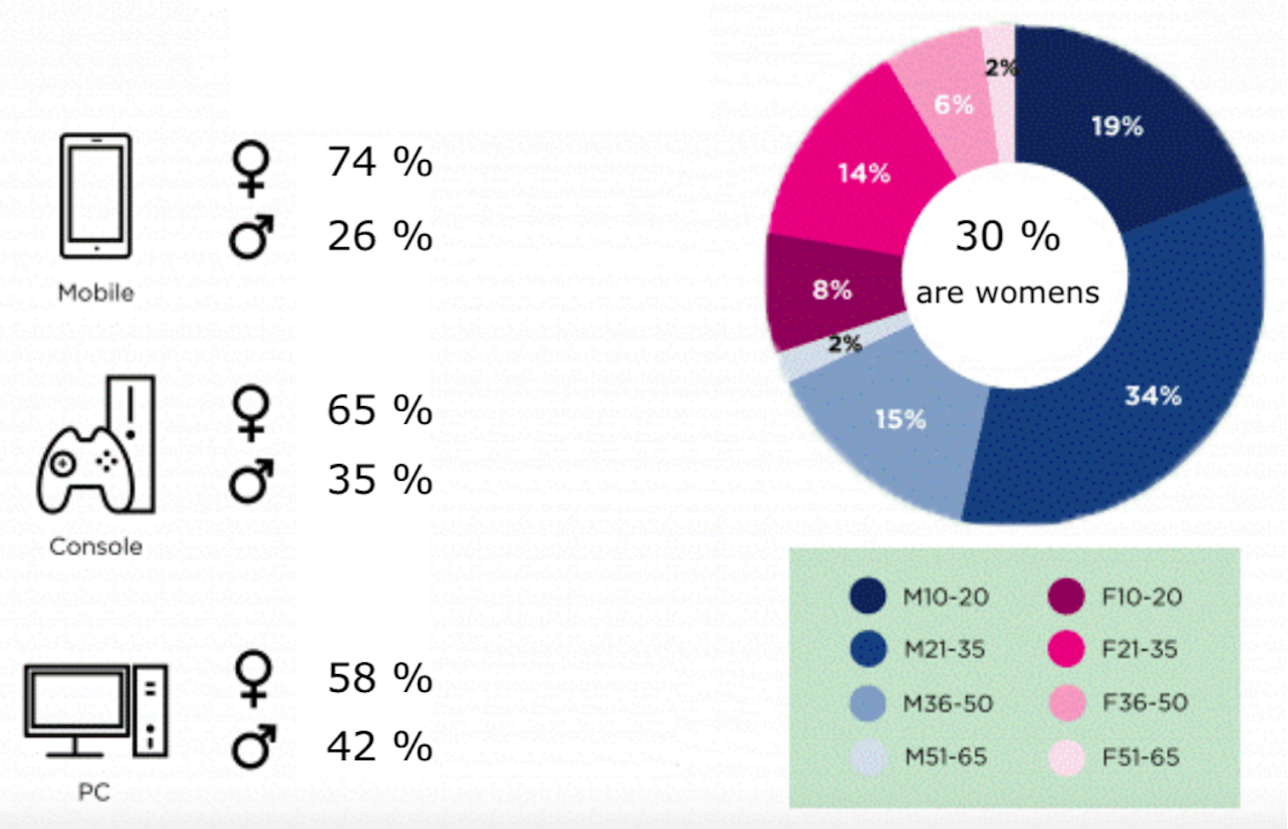

Figure 7. Demographic distribution of the video game population by age and gender (Newzoo.com, 2021)

The largest European representation of men and women when playing games can be found in Denmark, which represents a ratio of approximately 82% of men and 70% of women from their total population. The Czech Republic is not far behind in terms of men, who make up about 76% here. Unfortunately, women are not so fond of it in Czech country and make up a little over 50%, making Czech one of the countries in Europe where the least number of women play games. Overall, the Netherlands has the smallest representation, where approximately 70% of men play and not even 60% of women. But these demographic indicators should continue to develop and probably increase, just as it is the case on other continents. Especially the ratio for women should increase in the future (Statista.com, 2021b).

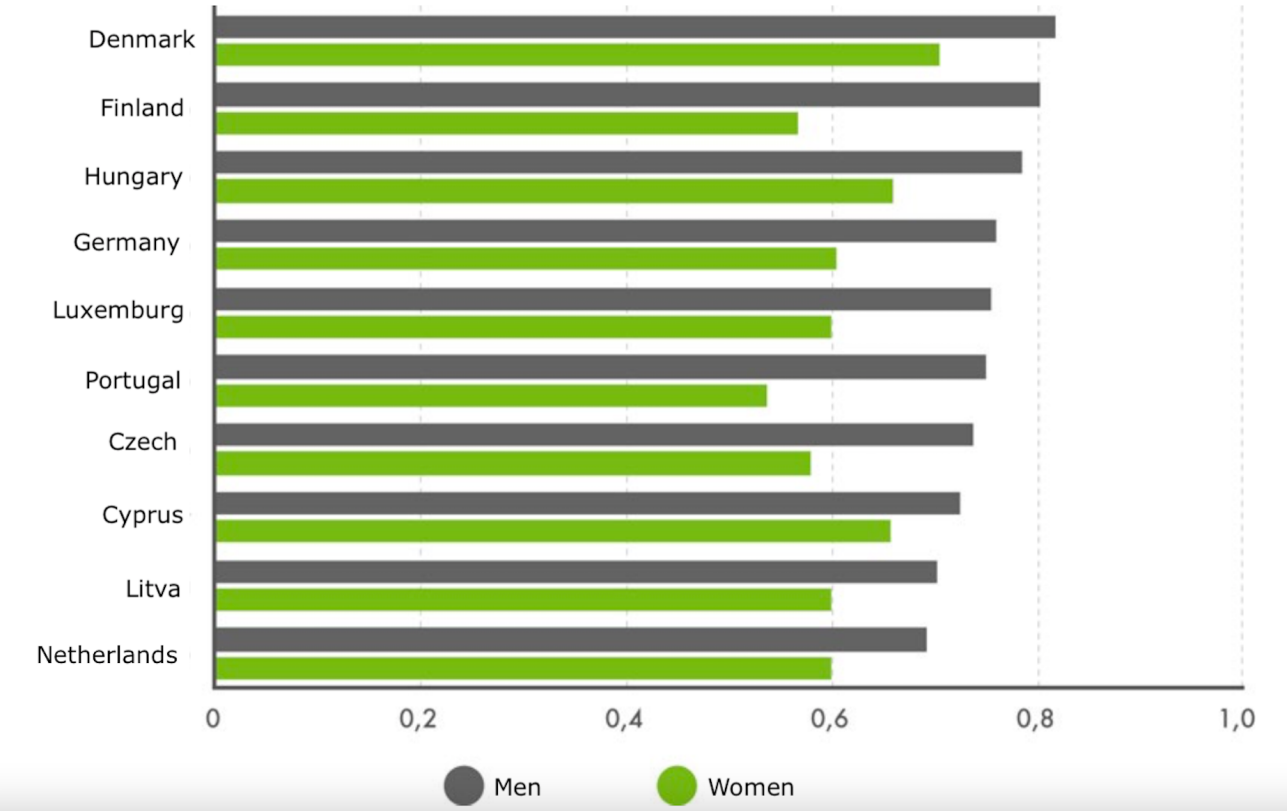

Figure 8. Comparison of 10 EU countries with the largest share of players aged 16-24 (Statistics&my, 2022)

Future trends in esports environment

In order to realistically talk about the future of esports, we need to look at the current state of the esports environment. According to research by Omnicom Media and the Czech News Center, the number of Czechs watching and playing esports, gaming or playing mobile games is estimated at 3.4 million people, which is more than 60% of the population aged 15-50 (MediaGuru 2020). If we take a closer look at the research of audience of esports in the Czech Republic (MediaGuru 2020), we can find that these 3.4 million people are divided into subgroups. From the point of view of the esports environment, we are mainly interested in the group forming the esports core. This group has roughly 900,000 people who actively follow esports and play a lot of competitive gaming titles on various devices.

We can compare these numbers with the global results of Newzoo's esports audience research, where the global audience with an interest in esports was 454 million people, an increase of 15% compared to last year. By 2022, the esports audience is also projected to reach 644 million people. If we talk about the size of the esports market, it exceeded the value of one billion USD worldwide

last year and should rise to the value of 1.79 billion USD by the mentioned year 2022. For comparison, the value of the esports market in Czechia, is estimated at 2 million dollars according to the Czech Esports Association (MediaGuru 2020). According to these numbers, we can say that esports is already a trend in itself.

4.3 Streaming Platforms

For competitive gaming and related content, it is also a good idea to analyse data from users and the community that both watch and create video content. It will be outlined in the chapter on watching esports, which is very closely related to this platform, as the majority of money is connected to streaming. The development of streaming has found itself high in the rankings among gamers in recent years, mainly thanks to the platform Twitch.tv and YouTube, which operate on the European and American scene. Of course, they also reached Asian countries, but there they have their own streaming platforms that they prefer. These are mainly streaming sources such as Panda.tv or Douyu, which did not make it to the world due to the Chinese and Japanese languages.

Users on YouTube upload millions of videos with a gaming context and try to make them as popular as possible and start monetizing them (making money with the help of advertising). Because of this, thousands of gaming channels have been created that serve a diverse focus on esport. These are mainly tutorials, fun video clips, reviews, edits, etc. Of course, they also have live streams, but they are not as well-known and popular for that. On the other hand, Twitch.tv works more like an online streaming platform to broadcast matches and tournaments live.

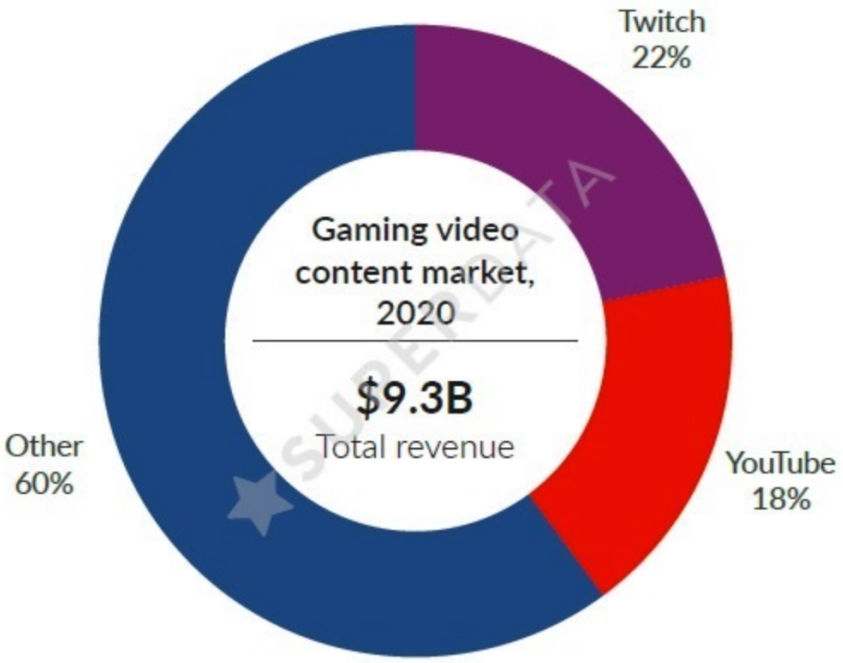

Figure 9. Representation of platforms by video game content (SuperData.com, 2020)

From the analysis of the company SuperData (SuperData, 2020), we can see that the amount of all revenues from streaming platforms for 2020 was 9.3 billion dollars. The largest share of this is the Twitch.tv platform, which represents a 22% share with 2,05 billion US dollars in revenue. YouTube came on second place with a 18% share and 1.67 billion US dollars in revenue. At the same time, as it is pointed out in the previous paragraphs, 60% consists mainly of the Asian market with smaller platforms or other smaller European services such as Facebook.

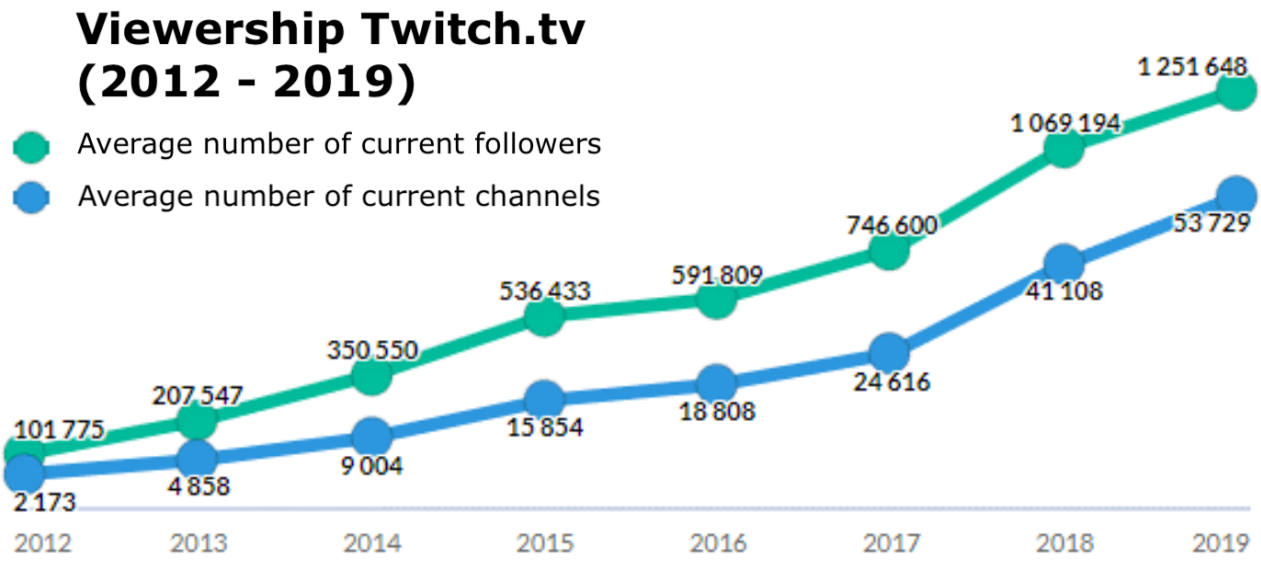

Figure 10. Average viewership and average number of channels between 2012 and 2019 (TwitchTracker.com, 2019)

The audience on Twitch alone now stands at 1.2 million viewers, a steady increase of around 17% over last year. We can follow the equally popular growing trend on other statistical indicators from the TwitchTracker.com server, which compare real-time and long-term statistics. (TwitchTracker, 2019a) In 2019, 658 billion minutes of content were viewed and it completely surpassed year 2018, when only 560 billion minutes were viewed in quotes. It is very likely that this trend will continue and next years will be in even greater numbers.

As already mentioned, the largest streaming platform is Twitch.tv, which, according to Mediakix (2020), has 9.2 million active streamers and is visited by around 15 million users daily. There are live broadcasts of all kinds on this site, and people can communicate live with streamers via chat. If a streamer meets the requirements to become a Twitch partner, people can give them so-called subs, which is a monthly subscription from which the streamer receives an agreed percentage from the Twitch site. Viewers can also send separate money with a message to support the streamer. The following figure shows how fast this site is growing in the amount of time spent by all users on Twitch.tv per year.

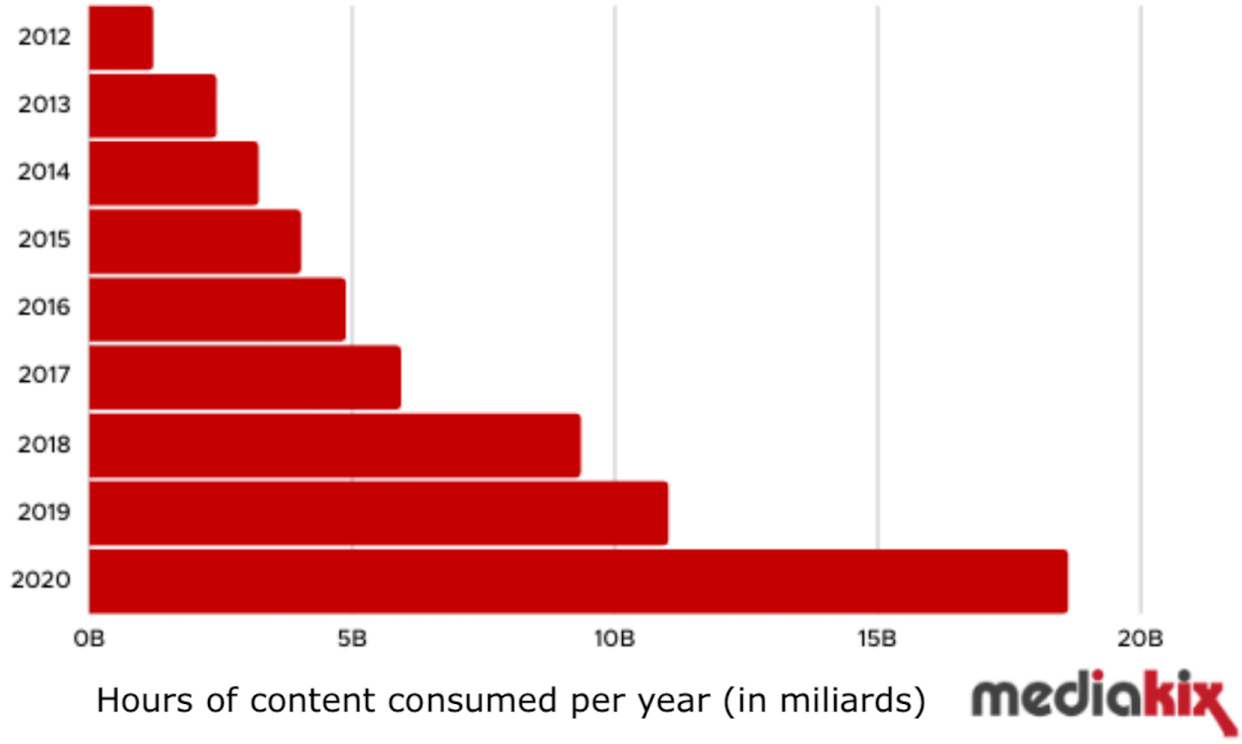

Figure 11. Time spent on Twitch.tv (Mediakix.com, 2020)

A term often mentioned in this master thesis is streamer. We could say that streamers make up the entire Twitch page. If it were not for them, people would not have anything to watch here. Most of them already consider streaming as their livelihood and do not exactly come up with the smallest amount of money. Although the largest part of their earnings is usually made up of advertisements and sponsors, thanks to Twitch they still have offers for these advertisements. On the wegotthiscovered.com page (2021) it is written that on average, a professional streamer can earn three to five thousand dollars per month if they actively stream about forty hours a week. However, this figure does not include payments from advertisements, which are around 250 dollars for every hundred subscribers. According to the Twitchtracker website (2022b), in the overall rating, which consists of the average number of viewers, followers, views and streaming time over the last thirty days, the streamer Agraelus is on the first place in the Czech Republic, followed by Artix, Herdyn, Spajkk and Fattypillow. These are the ten best Czech streamers, but their numbers unfortunately do not reach the numbers of world streamers, mainly because of the language barrier. The best world streamers are listed in the following table, which compares them based on the same parameters as the Czech ones.

Table 3. Top 10 streamers on the Twitch.tv platform in 2022 (Twitchtracker.com, 2022)

2022	Average viewers	Streaming time	Highest viewership	Tracked hours	Rank	Follower growth	Total followers	Total views
#1  ASMONGOLD	142,372	96.5 hours	427,880	13.7M	1	+338K	2.75M	216M
#2  N3KOGLAI	168,137	14.1 hours	543,743	2.36M	2	+225K	2.10M	10.4M
#3  XQCOW	77,909	284.8 hours	222,720	22.2M	3	+144K	10.0M	491M
#4  AURONPLAY	106,038	97.5 hours	602,038	10.3M	4	+559K	11.9M	243M
#5  FEXTRALIFE	52,325	345.7 hours	213,773	18.1M	5	+359K	1.31M	1,896M
#6  IBAI	90,423	111.7 hours	1,538,645	10.1M	6	+346K	9.42M	328M
#7  BLASTPREMIER	84,801	72.8 hours	270,934	6.17M	7	+71.0K	1.23M	113M
#8  ELXOKAS	48,385	268.5 hours	1,208,144	13.0M	8	+977K	2.72M	81.7M
#9  JUANSGUARNIZO	53,017	203.3 hours	409,967	10.8M	9	+803K	7.19M	153M
#10  LCK_KOREA	65,157	112.9 hours	623,617	7.36M	10	+27.6K	1.21M	375M

4.4 Esports Viewership

The viewership of esports grows every year. There are many esports sites where people can find out the latest information from ongoing events, information about future or past events, statistics of teams, players and also some personal information about them. Probably the most famous site is liquipedia.net, where people can find most of the data about esports tournaments from games such as Dota2, Valorant, Counter-Strike, PUBG, Rainbow Six, League of Legends and many others. The main platform for watching esports is Twitch, as already mentioned in the previous chapters. According to strivesponsorship.com (2020), esports tournaments are most watched by people aged 16-24 and 25-34.

Together, these two categories account for 62% of all age categories that watch esports tournaments. The most watched esports tournaments come from Asia. The most watched esports channel on the Twitch platform is Blastpremier, as seen in the table below (strivesponsorship.com, 2020).

Table 4. Top 10 esports channels on the Twitch.tv platform in 2022 (Twitchtracker.com, 2022)

2022	Average viewers	Streaming time	Highest viewership	Tracked hours	Rank	Follower growth	Total followers	Total views
#1 BLASTPREMIER	84,801	72.8 hours	270,934	6.17M	7	+71.0K	1.23M	113M
#2 LCK_KOREA	65,157	112.9 hours	623,617	7.36M	10	+27.6K	1.21M	375M
#3 LEC	59,330	110.9 hours	400,312	6.58M	11	+55.6K	1.66M	140M
#4 GAULES	19,679	712.3 hours	387,315	14.0M	16	+56.1K	3.30M	384M
#5 RAINBOW6	42,888	194.5 hours	191,703	8.34M	17	+91.0K	2.24M	110M
#6 ROCKETLEAGUE	50,632	79.2 hours	214,930	4.01M	20	+52.1K	3.50M	300M
#7 LCS	44,051	111.9 hours	400,429	4.93M	23	+59.2K	1.72M	157M
#8 LCK	39,700	107.7 hours	305,797	4.28M	32	+46.1K	1.34M	135M
#9 VALORANT	37,364	111.7 hours	344,755	4.17M	37	+149K	2.36M	105M
#10 PLAYAPEX	45,348	11.5 hours	74,191	521K	38	+32.4K	573K	16.2M

Viewership of esports mostly depends on the viewership of various tournaments. However, in the previous table, the mentioned channels that also broadcast recordings from tournaments and the entered data are the sum of everything streamed on these channels. The following table shows the individual tournaments according to the hours watched (Twitchtracker.com, 2022b).

The biggest esports tournaments do not only include matches between individual teams, but also an additional program in the form of a cosplay competition, where video game enthusiasts dress up as characters from the games, various show matches of the tournament, where well-known personalities, streamers or commentators compete against each other, interesting competitions for spectators for prizes or various musical performances (Twitchtracker.com, 2022b).

During these tournaments, big changes to the games are also often announced, such as new characters or changes to game mechanics that players can look forward to LoL with the World Champi-

onship tournament, CS:GO with the PGL Major tournament and Dota 2 with The International tournament are at the top of the viewership of esports tournaments. However, in 2021, the Counter-Strike tournament was replaced by the mobile game Mobile Legends, another indicator that mobile esports is coming to the fore (Escharts.com, 2021).

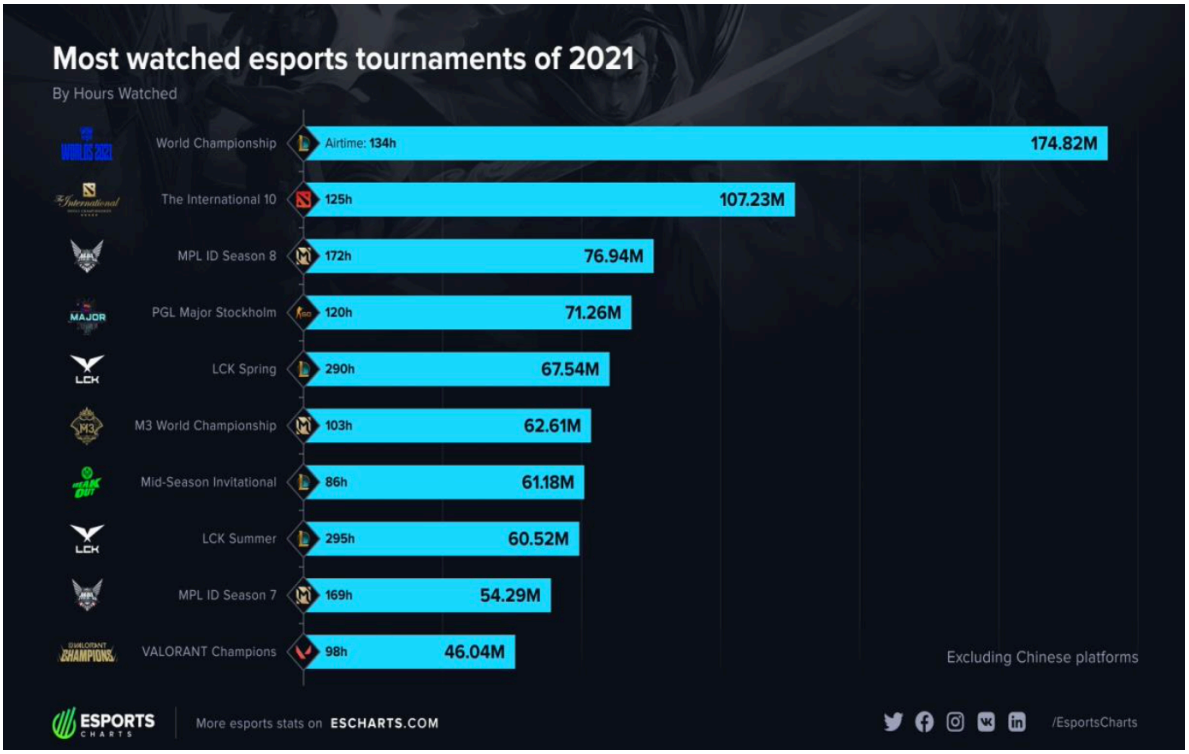

Figure 12. The most watched esports tournaments of 2021 (Escharts.com, 2021)

People choose tournaments and events just like they do with normal sports, depending on the type of sport. Someone will go to watch the football championship, someone will watch hockey, and someone will decide between League of Legends and Dota 2. Fortunately for esports fans, most live broadcasts are completely free and can be watched over the Internet in many languages.

The table inserted below shows us the most watched esports games on Twitch and YouTube platforms. The interesting thing is that there is no mobile game on the Twitch platform (there is a game Hearthstone, which has its mobile version, but originally it is a PC game), while on YouTube there are three in the top ten most watched games. For other game consoles, views are poorly determined by game platform, as most esports games exist on both game consoles and PCs. For the FIFA game, for example, tournaments take place immediately on three platforms, namely on PC, PlayStation and Xbox. On the right side of the Twitch.tv table, we can also observe the change field, which compares the position of the given game with the position of the previous year (Newzoo.com, 2019c).

Table 5. The most watched esports games in 2019 by views (Newzoo.com, 2019)

twitch

Rank	Name of game	Watched hours	Change
1	Dota 2	16.2M	▲ 1
2	League of Legends	15.0M	▲ 1
3	Counter-Strike: Global Offensive	9.9M	▼ 2
4	Hearthstone	3.6M	-
5	Super Smash Bros. Ultimate	2.0M	▲ 3
6	FIFA 19	1.6M	▼ 1
7	Tom Clancy's Rainbow Six: Siege	1.1M	▲ 7
8	Call of Duty: Black Ops 4	1.1M	▼ 1
9	PLAYERUNKNOWN'S BATTLEGROUNDS	1.0M	▲ 3
10	StarCraft II	0.8M	▲ 4

YouTube

Rank	Name of game	Watched hours	Change
1	League of Legends	5.5M	NA
2	Tom Clancy's Rainbow Six: Siege	1.4M	NA
3	Arena of Valor	1.2M	NA
4	Dota 2	1.1M	NA
5	PLAYERUNKNOWN'S BATTLEGROUNDS	0.3M	NA
6	Counter-Strike: Global Offensive	0.3M	NA
7	Age of Empires	0.2M	NA
8	FIFA 19	0.1M	NA
9	Mobile Legends: Bang Bang	9.2K	NA
10	Clash Royale	3.5K	NA

Following figure shows the top esports teams that have won the most prize money based on tournament results. Data is collected from the beginnings of the team until November, 2021. The best team worldwide by achievements is difficult to determine, due to the diversity of the playing sections in the teams. In the field of esports, for example, the OG team, which won the most prestigious tournament in Dota 2 twice in a row, but in Counter-Strike, according to esports-news.co.uk (2022), they are ranked tenth in the world.

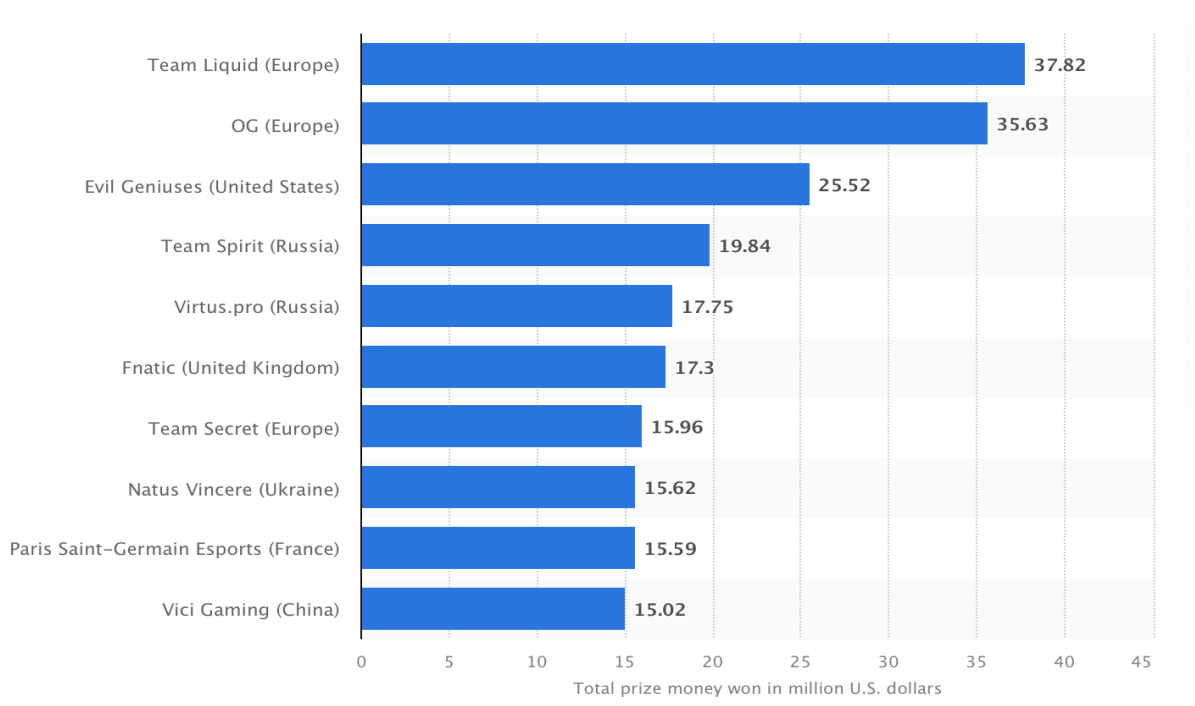

Figure 13. Ranking of the highest-grossing esports teams worldwide (Statista.com, 2021)

Players are an integral part of esports and classic teams. These players usually get into the team through various scouting, as is the case in regular sports. Players usually play at a high level in ranked matches in a given game. Each game has a different rating, but they all work on the basis that the more the player wins, the more plus points he/she gets and moves up the rank. For better clarity, this ranking is divided into different divisions. (Statista.com, 2021c)

This is one of the ways scouts of individual teams can spot good players. Another possibility is that the player started in a smaller team, showed an excellent performance in various tournaments, and thus endeared himself/herself to a scout from a larger team, and he/she will join them. The most successful players are currently the members of the OG gaming organization in the Dota 2 game, who managed to win The International tournament twice in a row, earning a total of less than sixty million dollars. (Statista.com, 2021c)

Table 6. Top 10 Esports players with the highest income in 2022 (Esportearnings.com, 2022)

	Player ID	Player Name	Total (Overall)	Highest Paying Game	Total (Game)	% of Total
1.	N0tail	Johan Sundstein	$7,183,837.80	Dota 2	$7,172,111.58	99.84%
2.	JerAx	Jesse Vainikka	$6,480,948.78	Dota 2	$6,480,400.02	99.99%
3.	ana	Anathan Pham	$6,004,411.96	Dota 2	$6,004,411.96	100.00%
4.	Ceb	Sébastien Debs	$5,773,909.40	Dota 2	$5,773,909.40	100.00%
5.	Topson	Topias Taavitsainen	$5,690,417.57	Dota 2	$5,690,417.57	100.00%
6.	KuroKy	Kuro Takhasomi	$5,221,264.15	Dota 2	$5,219,540.81	99.97%
7.	Miracle-	Amer Al-Barkawi	$4,824,201.68	Dota 2	$4,824,201.68	100.00%
8.	MinD_ContRoL	Ivan Ivanov	$4,605,276.16	Dota 2	$4,605,276.16	100.00%
9.	Matumbaman	Lasse Urpalainen	$4,520,649.04	Dota 2	$4,520,649.04	100.00%
10.	GH	Maroun Merhej	$4,219,570.69	Dota 2	$4,219,570.69	100.00%

The biggest part of the income of esports teams is made up of winnings from tournaments in which their individual game sections participate. The winnings usually consist of a large prize pool, which is then divided among the teams based on their placement. This money then goes in part to the organization for its operation, to the players and sponsors (Esportearnings.com, 2022)

From the following figure, it can be seen that the game Dota 2 has a clear advantage with The International tournament, which was placed in the first six positions here. These huge sums of prize funds are due to an excellent marketing move by Valve, which always makes a so-called battle pass available to all Dota 2 players before The International tournament. This battle pass usually costs ten dollars. Players collect levels here and are gradually rewarded for them. However, those players who want to receive the highest rewards must purchase these levels with real money. Part of this

money spent by players in the Battle Pass then goes to the prize pool of The International tournament (Statista.com, 2022d).

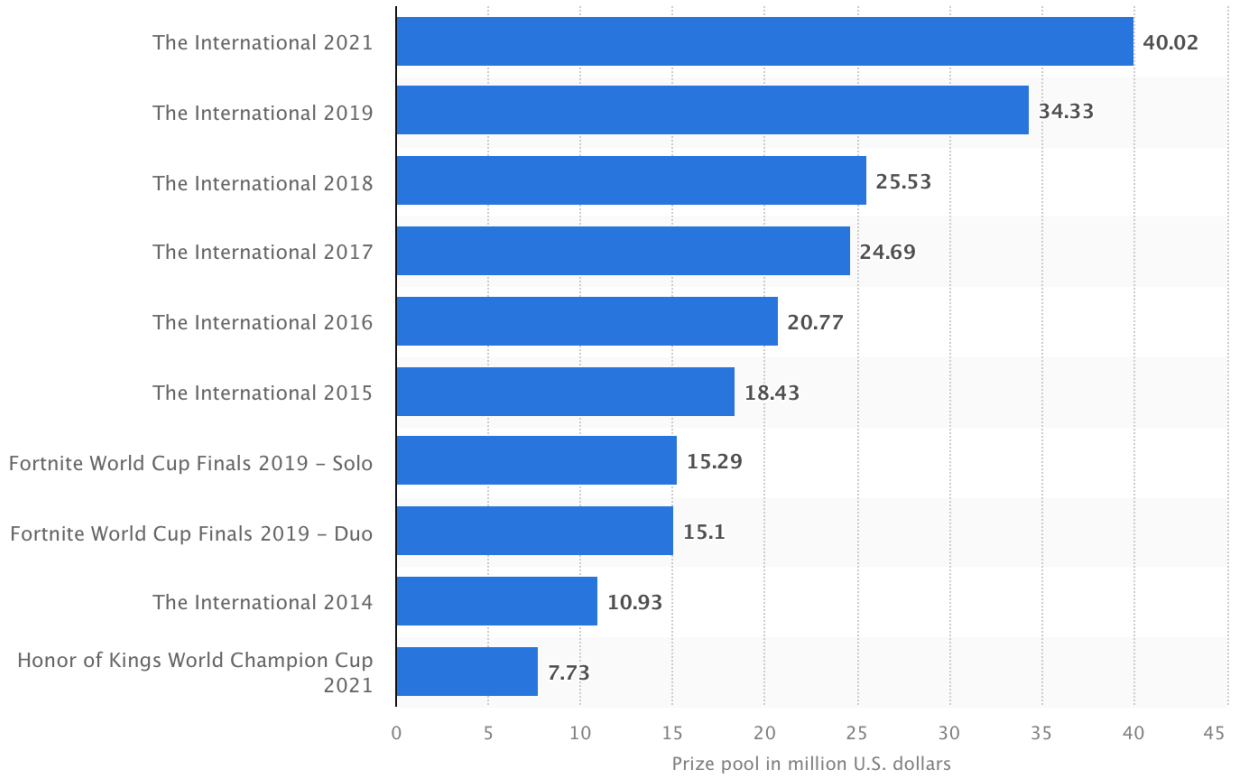

Figure 14. Tournaments with the largest prize pool (Statista.com, 2022)

4.5 Analysis of Esport Players

The most important component of the entire structure of esports is the player base. Without players, there would be no game titles published, no tournaments, competitions and various events held, and no audience in the industry of video games. The following figure shows the total number of video game players from 2015-2023 published by the analytics company Newzoo.com. We see the number of players growing exponentially every year. Between 2015 and 2021, this is almost double growth (Newzoo, 2020d).

According to this, we can judge that the video game market is growing at an unusual rate, and as this entertainment industry is a new phenomenon, it already attracts a significant part of the population of the entire planet. The Newzoo company also displayed a prediction until 2023 in its graph and divided the number of players according to the platform on which the players operate. From a logical point of view, the mobile device is in the first place, as it is easily accessible and the player

can play on his/her phone almost anytime and anywhere. Other reasons why most players play on a mobile device are the improved mobile and internet infrastructure, the improvement of the technology of the devices themselves, their affordability and the penetration of phones in the population. Console is on last place, although this group is made up of both PlayStation and Xbox consoles (Newzoo,2020e).

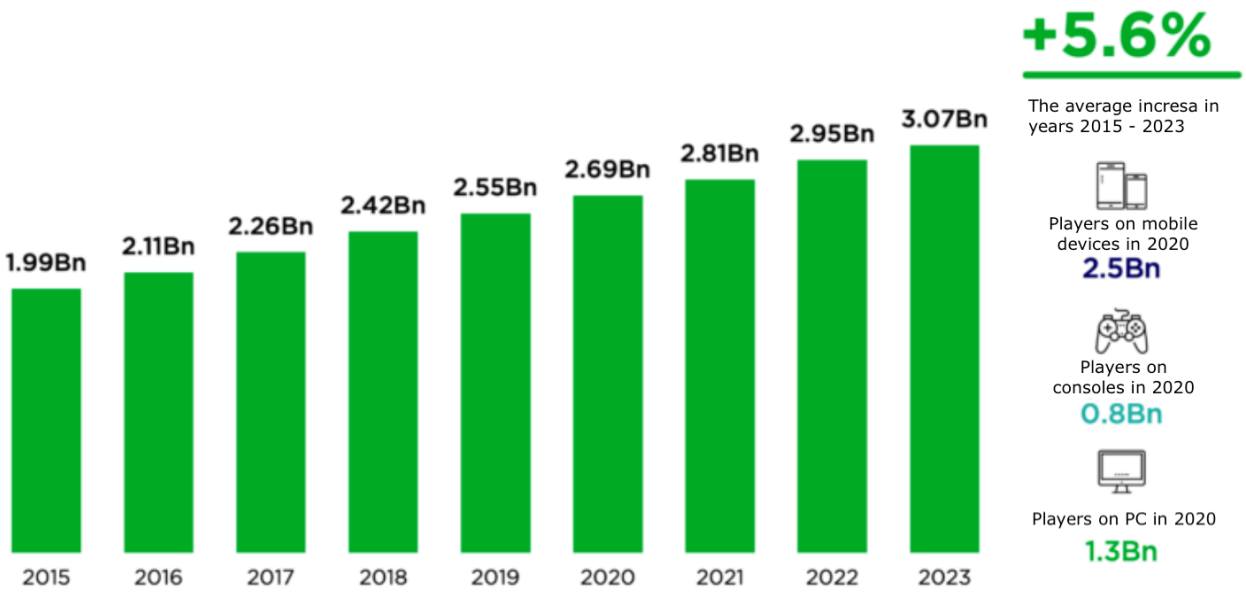

Figure 15. Total number of video game players between 2015-2023 (Newzoo.com (2022)

After the total number of players, it is also very important to have a closer look at their geographical distribution, which is shown in following figure. It is not surprising that majority of all players are based in Asia and Oceania. Asia is then considered as the cradle of both mobile and computer games. It was the first tournament to be created here, and currently some of the best players in the current esports scene come from Asia. However, annual growth is not the greatest on this continent. One reason is the declining birth rate in Asian countries. The Middle East and Africa can boast the greatest annual growth. This is mainly due to technological progress and the developing infrastructure in this part of the planet, which was far behind compared to the rest of the world. It will therefore be very interesting to see how these numbers change over a five to ten-year horizon (Newzoohq.medium.com, 2021)

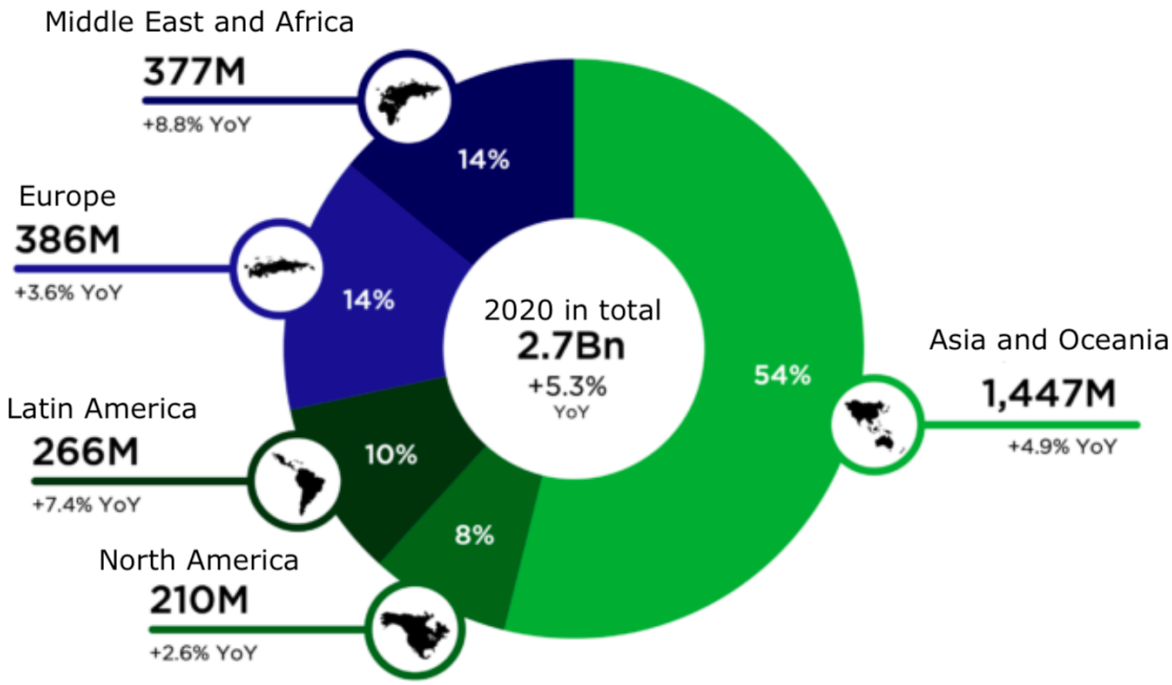

Figure 16. Global player layout in 2020 (Newzoo.com, 2020)

If we focus only on PC games, the biggest platform for playing PC games is Steam. As we can see in following figure, thousands of new games are released on this platform every year. The statistics are only up to 2020. It is therefore no surprise that such an offer of game titles attracts players from all over the world to this platform. In the article on Statista.com, J. Clement (2021) reports the statistics of the number of active users of steam every month between 2017 and 2020. While in 2017 the average monthly number of active users was in the range of 67 million, in 2019 the number increased to 95 million and in 2020 around 120 million active players appeared on the Steam platform each month. This big jump is mainly due to the pandemic situation. The second big platform is Epic Game, where Fortnite and Rocket League are mostly played. The platform had an average of 56 million monthly active players in 2020 (Wolf, 2018). From this it can be concluded that Steam continues to occupy the first position in the number of active players.

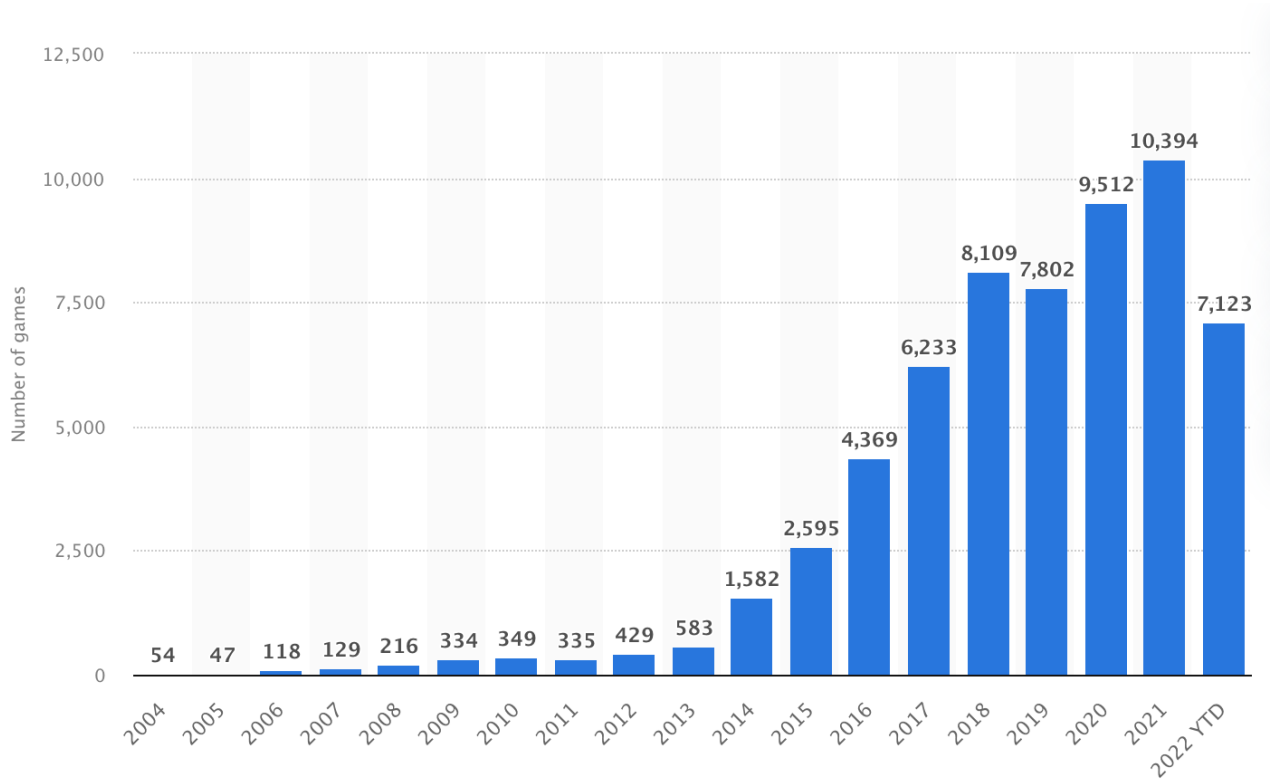

Figure 17. Number of games released on the Steam platform in 2004-2022 (Statista.com, 2022)

The annual increase in the number of viewers in Europe compared to 2019 is 7.4%, according to the website g-mnews.com. This is an increase from 86 million to 92 million. This data is taken from Newzoo.com and is shown in the following figure. The figure also shows the ratio between esports enthusiasts and casual viewers. The ratio between the two groups remains more or less the same every year.

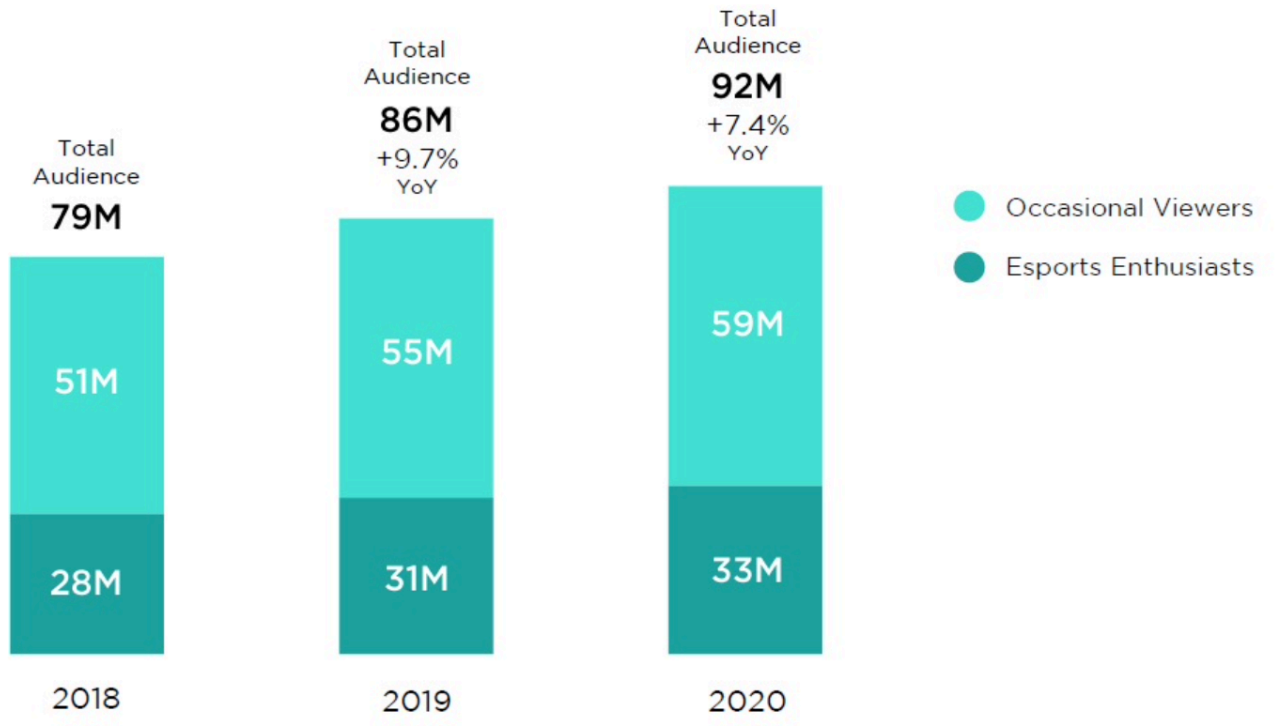

Figure 18. Esport audience growt in Europe 2018-2020 (g-mnews.com, 2020)

4.6 A Case Study of Covid-19

The disease of covid-19 does not need introduction. It has been with us since 2019, when it was still taken lightly and a year later the disease spread around the world and the governments of different countries started to act. Measures were coming to slow the spread of this disease. Mandatory wearing of respirators, limited number of people at public events and many others. People who were affected by this disease were quarantined by the state, which initially lasted for two weeks, which changed over time. So, people were often isolated at home and had nothing to do. That's why they started getting game consoles, new computer equipment or buying new games. According to data from Statista.com (2022e), revenues from downloaded games and in-game content increased by 12% and 21%, respectively.

According to these statistics, it could be said that this covid-19 pandemic situation has had a positive impact on the gaming industry, but there have been a lot of other problems due to this pandemic. A large number of video game companies had to postpone publishing of new game titles several times. The same was the case with Sony and Microsoft, who had to postpone their new game consoles by several weeks due to this pandemic. Big gaming events such as Electronic Entertainment Expo, Gamescom or BlizzCon had to be either completely cancelled or held online, which did not

bring in as much revenue as when these events were held offline, people had to buy tickets and could spend money on game-themed items (Statista.com, 2022e)

A similarly affected part was the esports market. Many major gaming tournaments were cancelled, players could not travel from their countries and therefore could not train together in their boot camps, and how many times the team had to call a substitute when someone from the main line-up contracted covid-19. Which affected the performance of the entire team and thus the performance in matches or tournaments. If we look at this from the overall viewership of esports, we will find that there has been an increase in many countries. This is shown in the following figure, which was created by a Deloitte survey asking consumers if they stopped watching esports, started watching esports, or are still watching esports during the covid-19 pandemic. Consumers from eight countries responded to this survey (Deloitte, 2021)

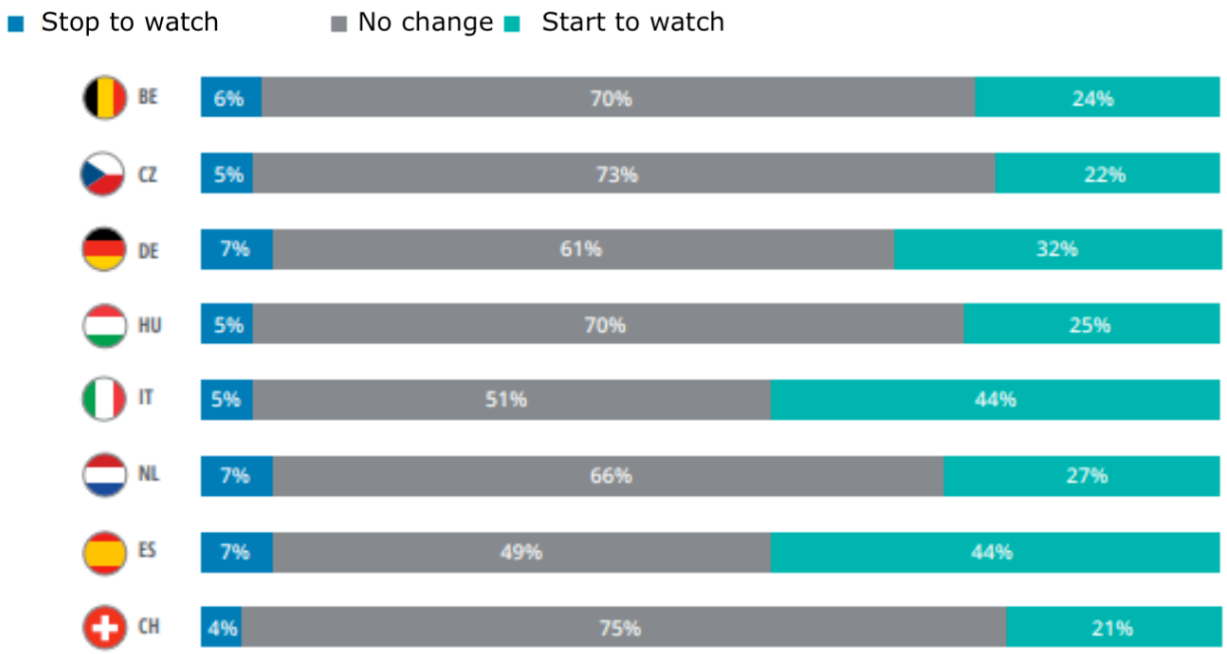

Figure 19. Changing consumer views on esports during the covid-19 pandemic (Deloitte.com,2021)

As mentioned before, the largest esports streaming platform is Twitch.tv, which is why this site is used in the following figure that shows its growth during the covid-19 pandemic. The data was taken from Twitchtracker.com (2022) and three indicators are shown here: Average concurrent viewers, Average concurrent channels and total number of broadcasts per month. We can observe a large increase between 2019 and 2020 in all of the above data, when the covid-19 disease began to spread rapidly and states began to issue various measures. The total number of broadcasts per month has

more than doubled since the beginning of the pandemic, and the growth will certainly continue in the coming years, even if it will not be this enormous. The 2022 data can be a bit confusing, where it should be noted that this data is from the month of February, 2022.

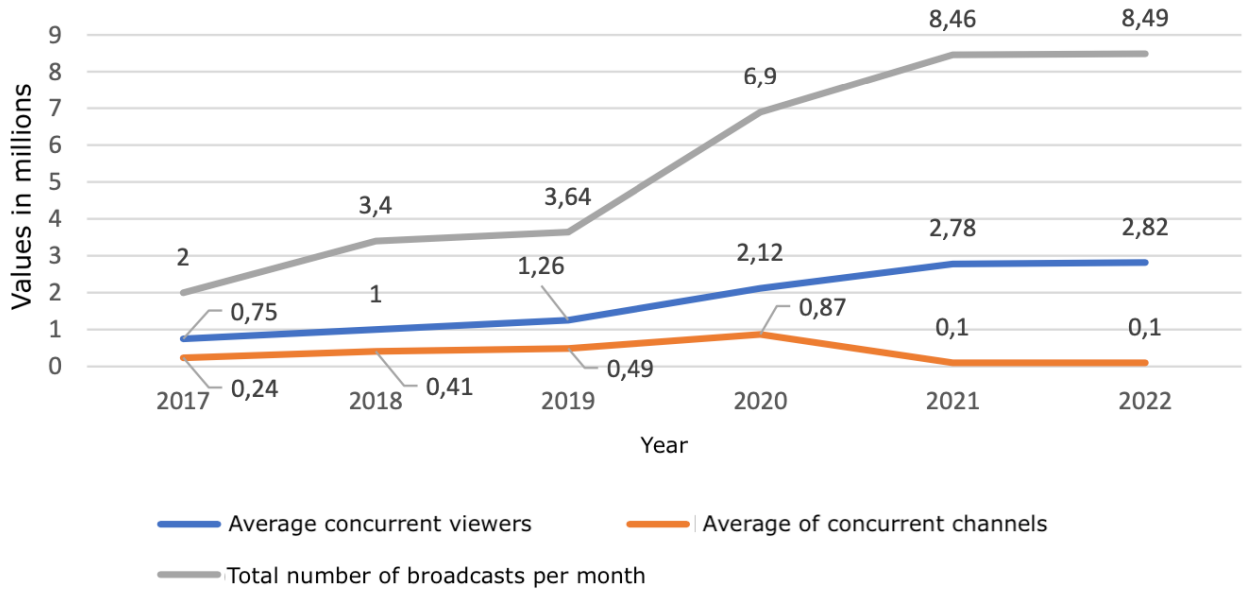

Figure 20. Statistics of the Twitch.tv platform during the covid-19 pandemic (Deloitte.com, 2021)

The second paragraph of this chapter mentioned the negative impact on esports and video game organizations, even though esports viewership is growing due to the pandemic according to the figures. This is due to the fact that watching esports is mainly online, which has not been affected by government regulations. On the contrary, it could be said that government regulations have greatly helped the entire online world. The following figure focuses on the development of esports organization revenues before and during the covid-19 pandemic. We can see here that the largest percentage of respondents answered that there was no change for them during the covid-19 pandemic. Which would mean that the majority of companies were not affected in any way, but if we compare it with the data, which shows revenue increases of 20-40%, we find that before the pandemic, 28% of respondents achieved this increase, and only 8% of this increase achieves during the pandemic. Which is already a considerable difference. We also observe here that there was almost no decline in income development before the pandemic.

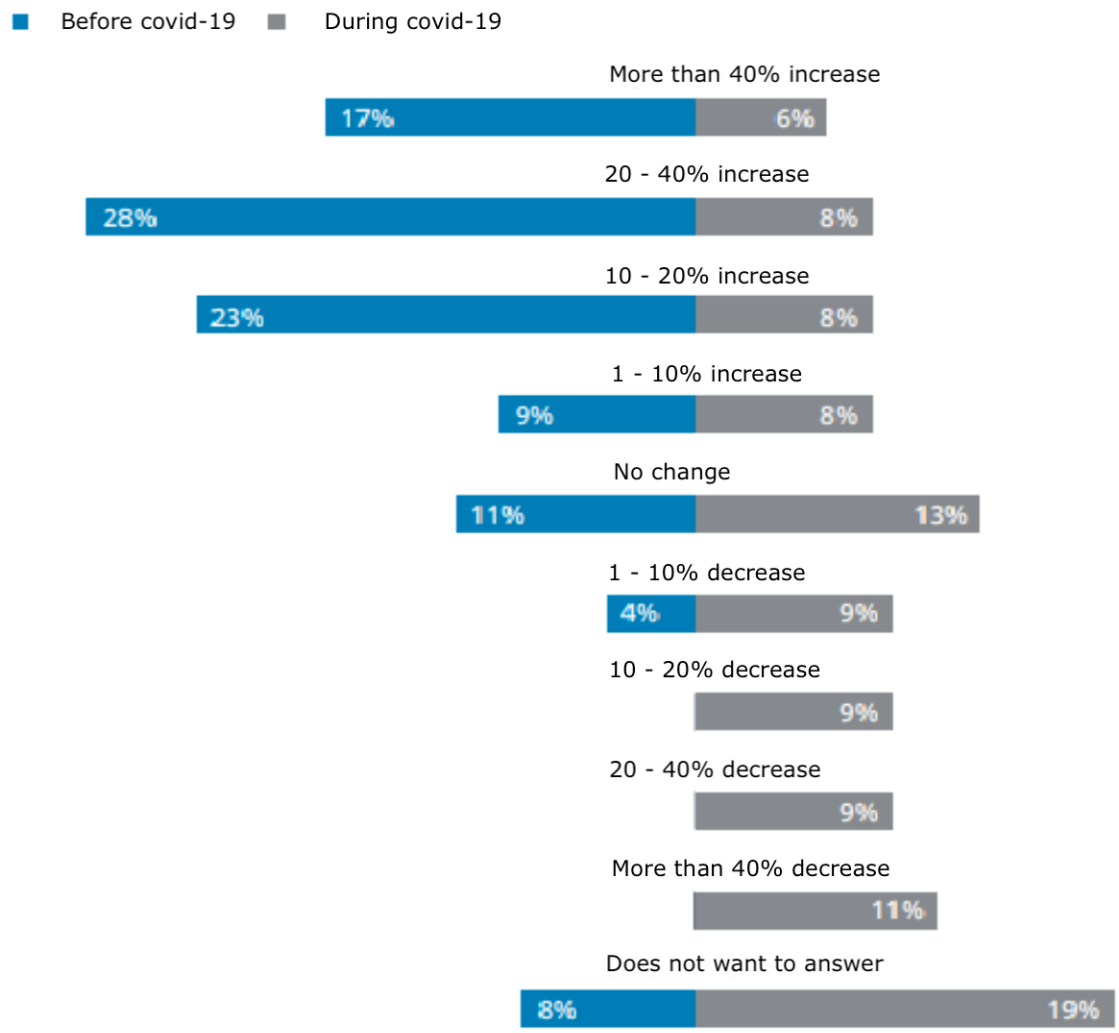

Figure 21. Development of income of esports organizations before and during the covid-19 pandemic (Deloitte.com, 2021)

In conclusion, we could therefore conclude that the pandemic has rather supported the viewership of esports and accelerated the growth of viewing platforms, namely the Twitch.tv platform. The number of broadcasts on this platform has more than doubled and many people have learned about esports and started watching it. Compared to normal sports, we can say that esports has not been affected as much due to its size in the online world. Unfortunately, esports organizations have suffered some losses due to the pandemic, but most of them have been able to adapt and minimize their losses. In the coming years, according to documented forecasts, all esports organizations should see revenue growth again, unless the market is again hit by a negative impacting event.

Humanity did not have to wait very long for such an event, and at the moment of writing this master thesis, a war is taking place in Ukraine, which is already slowly beginning to influence the esports

world as well. Tournament organizers are beginning to ban Russian teams from their tournaments, Russian players are under public pressure, and Russian gaming organizations are being affected by sanctions imposed on Russia for its attack on Ukraine. In support of Ukraine, a large number of esport teams changed their logos to blue-yellow colours and some of them also helped financially.

5 Results

The author will make predictions of the esports industry and video game markets development in this chapter. There are analyzes of the esport market, video game players, game viewership, platforms used to create video game content, and then forecasts related directly to esports. These forecasts are made according to secondary data that the author obtained from several sources, such as Newzoo or Statista. Twitchtracker, Steamcharts and others were mainly used to obtain viewership data. When creating graphs and figures, data from multiple sources are always used, which are then averaged and used for the following prediction. Predictions are made as described in chapter 3.3. Forecasts are mostly made until 2030 with an accuracy factor of 95%, thanks to which we get the lower and upper bounds of the possible forecast. The resulting graphs, figures and modified forecasts are created in an application from Microsoft, in MS Office Excel. Labels, values and colour visualization have been added for better clarity.

5.1 Video Game Industry Forecasts

The first figure of this chapter introduces us to the forecast of the development of the video game market until 2030. This market can be taken as computer games, web games, mobile games or console games. Data were collected from multiple sources and averaged. As can be seen from the graph, in 2030, the video game market should be worth 266.7 billion dollars. The value of the annual growth rate, or the abbreviation CAGR (Compound Annual Growth Rate), came out to be 5.93%. So, the video game market should rise considerably.

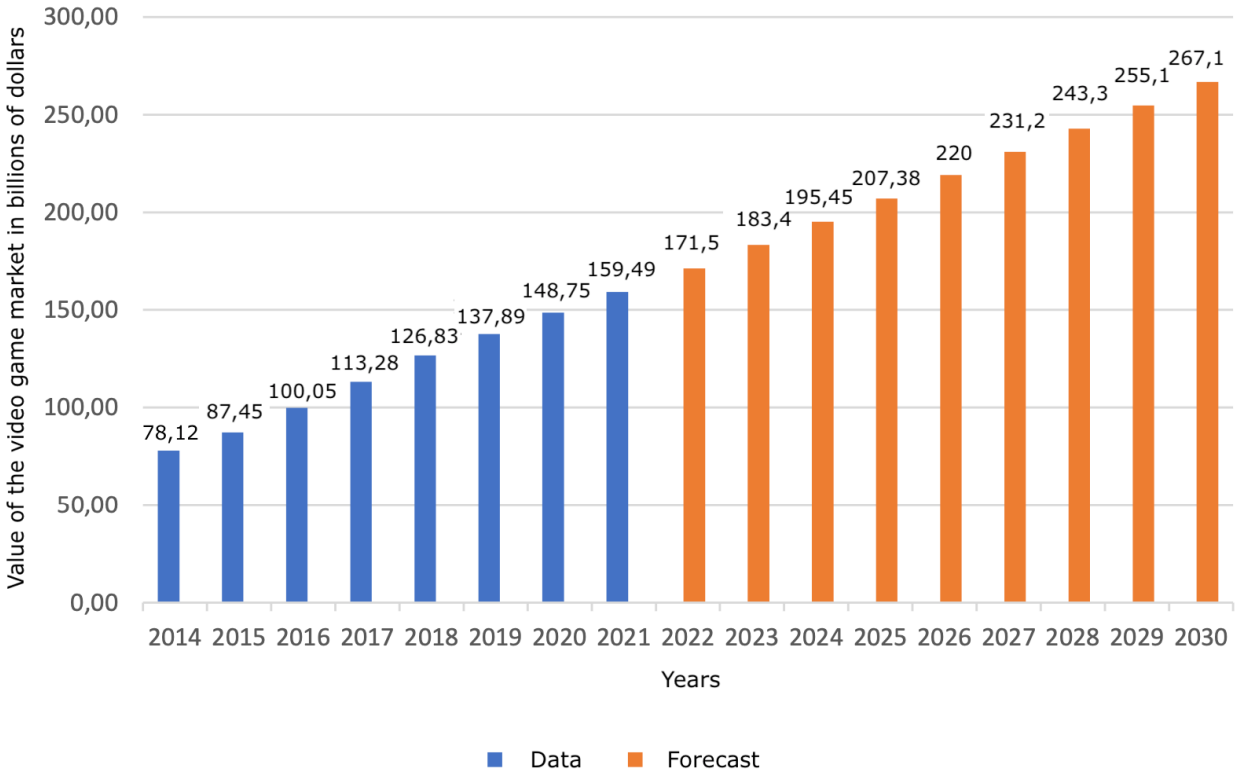

Figure 22. Forecast of the video game industry until 2030 (The author, 2022)

The following figure follows on from the previous one and shows us a forecast of the distribution of the value of the video game industry according to mobile, PC or game console games. The data is collected mostly from the Newzoo site, transformed into one graph and then a forecast for the year 2030 is created. The individual CAGR indicators are 7.88% for mobile games, 2.20% for PC games and 6.62% for games on game consoles. As can be seen, the largest growth should be in the market for mobile games, which is currently the most widespread. This graph therefore beautifully supports the already mentioned information in chapter mentioned earlier.

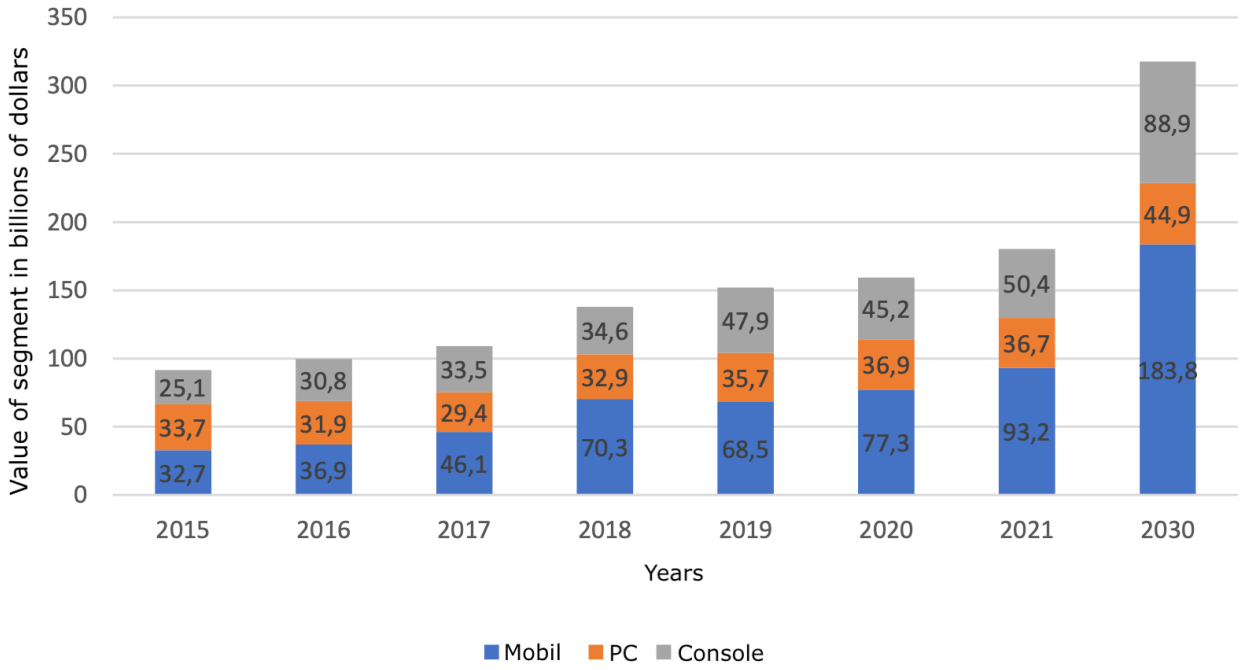

Figure 23. Forecast of the value of the video game market by mobile, PC or console (The author, 2022)

If we look at the following figure, which was created based on data from Newzoo and Statista, it can be seen that the number of players is increasing every year, and in 2030 we could expect up to 4.44 billion video game players. This number is the sum of professional and amateur video game players across all platforms. Which could be a good indicator, for example, for game developers and game event organizers. The value of the CAGR indicator is 3.25%. However, according to the website socialnipolitika.eu (2021), the world population should be approximately 8.5 billion people in 2030. Which, according to the prediction, would mean that slowly one in two people would play video games, which is highly unlikely.

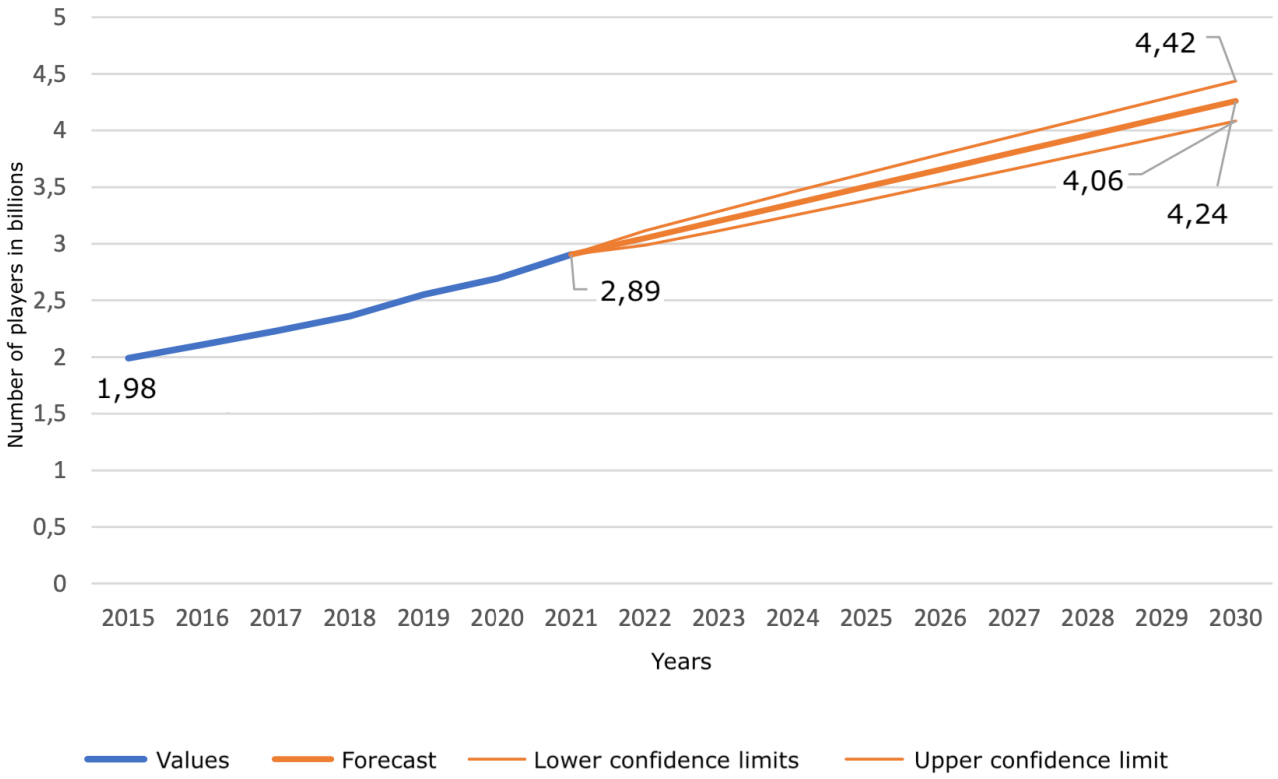

Figure 24. Forecast of the number of active video game players in 2030 (The author, 2022)

In order to get a little more realistic data, the author has used the method of partial sums, where the described time series is laid out. It is a variant based on logistic regression analysis, which takes into account the parameter that the number of players cannot rise to infinity. The author took also into account the total population of the world as a limiting factor. This method gave me more realistic results from my point of view. The logistic trend assumes that in 2030 we should have approximately 4 billion video game users.

As we can see in the picture, which indicates a result that resembles the resulting curve of the logistic function, or rather its end. It should currently be at a stage where it is approaching the maximum value of one. This means that the potential growth of new players in the future will not be as great. The logistic trend assumes that in 2030 we should have approximately 4 billion video game users.

5.2 Esports Forecasts

The author intentionally separated the chapter on esports forecasting from the previous chapter for clarity, even though the two chapters are very related. Here we find out how esports could develop into the future and whether it has a rich future like the entire video game market. If we talk about esports viewership, the main broadcasting platform for esports tournaments and events is twitch.tv. According to this page, most of the following figures will unfold. Other platforms that broadcast esports tournaments are, for example, YouTube, Facebook, or some games have the option of watching tournaments directly from the application.

As the first figure, it will be firstly shown the real size of the streaming site twitch.tv, which has experienced a huge increase in viewers since its inception. However, this figure will include all streaming categories from esports to the ASMR (Autonomous sensory meridian response) category. The following figure shows that viewership has more than doubled since 2019. Which could be because of the covid-19 pandemic and people having more time to watch this platform. Furthermore, we can notice a big difference between the lower and upper bounds of the forecast. This is due to the large CAGR number and that is 15.03%. However, an increase of 7 million viewers is most likely.

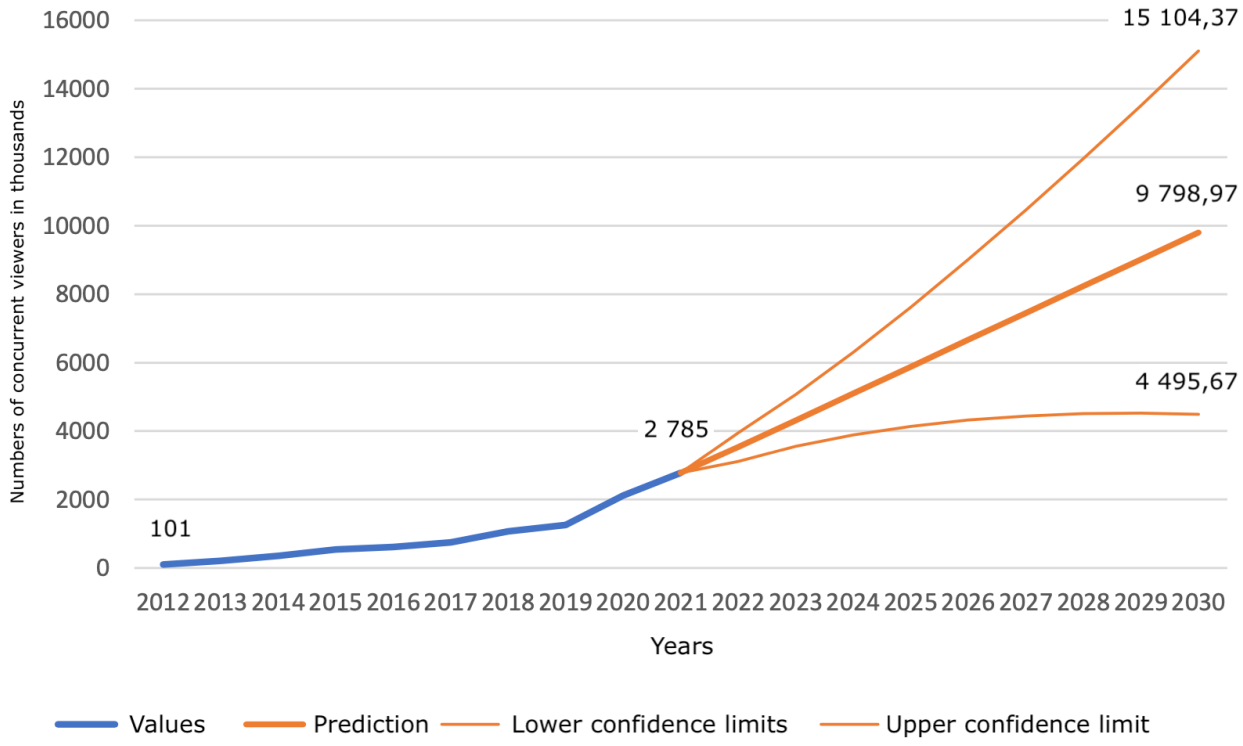

Figure 25. Forecast of the number of viewers watching Twitch.tv concurrently (The author, 2022)

If we focus on esports viewership only, we will see a growing trend. According to data from the website Newzoo, esports viewership should reach 830 million in 2030. Which would mean almost twice today's value. Recently, the covid-19 affected esports events, i.e. some tournaments had to be cancelled. Lately, the organizers decided to hold these tournaments online, but they had to be divided by continent for better internet response for the players. Thanks to this smart move, it managed to get esports viewership back on track. The downside to this was that these were then online tournaments where people did not have to buy tickets and deal with offline tournaments. As a result, some organizers lost part of their profits. For this forecast, the upper and lower bounds differ only' by 50 million. Here, the CAGR value is around 6.56%.

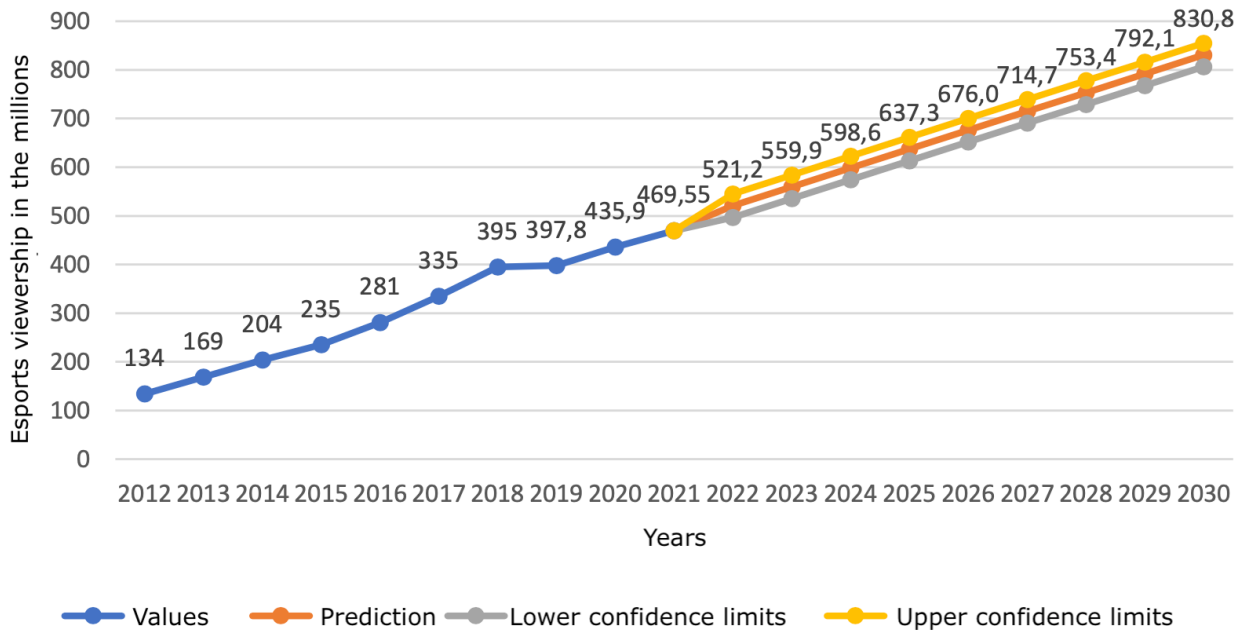

Figure 26. Forecast of esports viewership until 2030 (The author, 2022)

To get a better look at the viewership of esports tournaments, the author selected the game League of Legends and its largest and most watched World Championship for further analysis. However, the same analyzes could be made for all esports games, but in my opinion the game League of Legends is the one that is more known even to a wider audience. According to escharts.com's (2021) Watch Hours, Average Viewers and Peak Viewers, the author has created the following figure showing the forecast for this tournament to 2030. The data is collected from four streaming platforms, including YouTube and Twitch.

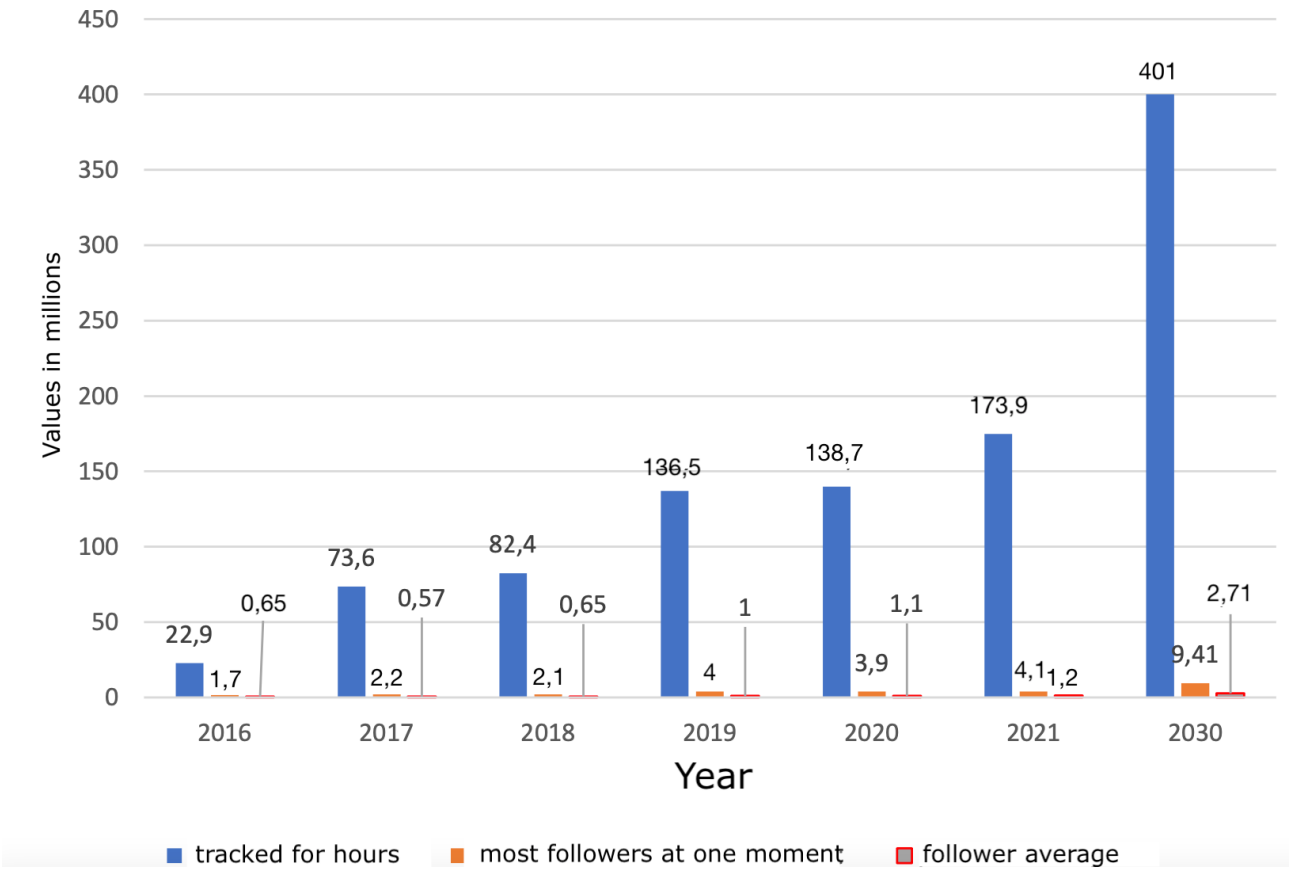

Figure 27. League of Legends World Championship tournaments forecast for 2030 (The author, 2022)

If we generalize the previous figure more, we will look at the development of the number of tournaments in all games combined since 1998. Here, thanks to esportsearnings.com (2021), the author managed to get a lot of data compared to other figures. However, no one probably knows how many tournaments were official and how many tournaments were still unofficial. On the graph, we can observe an interesting change in the number of tournaments, from 2015 to 2019, where the number of tournaments started to decrease.

The reason could be the building of tournaments on quality rather than quantity. Players and spectators are more attracted to tournaments where large amounts of money are at stake than more small tournaments with smaller amounts of money. It is more difficult for players to travel between many tournaments and they prefer to choose the more profitable ones. However, these tournaments were replaced by tournaments that were divided according to the continents. As a result, several small online tournaments emerged from one large offline tournament.

As we can see, the forecast boundaries for 2030 are very different. Personally, I'm more inclined towards the middle or lower limit. The number of tournaments for me will be similar, but the prize pools will increase. The size of the CAGR value here is less than 5% at the middle limit, 9.8% at the upper limit and 2.7% at the lower limit.

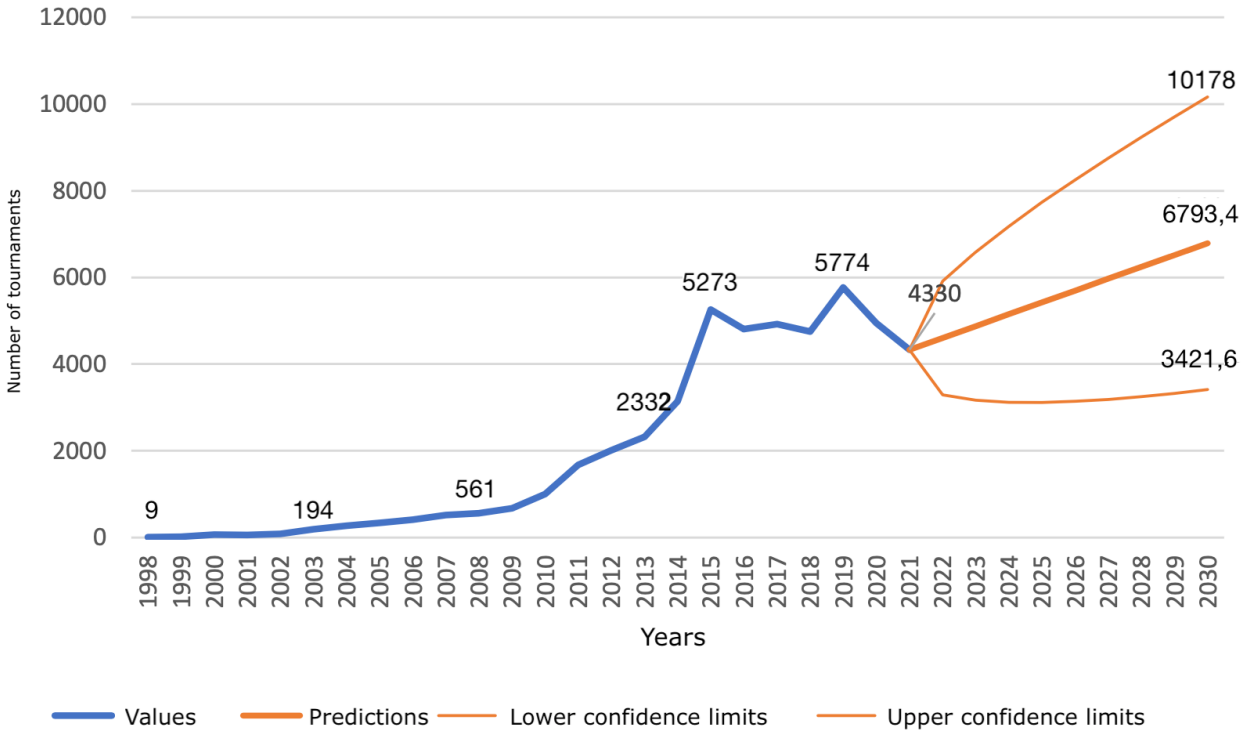

Figure 28. Forecast of the number of esports tournaments until 2030 (The author, 2022)

The author has already talked about prize pools in esports tournaments. For some, this part is the most important, namely for professional esports players, for whom this amount can mean a way of life for the following months. Of course, many players also have income from other sources, but they also have shares from these prize pools. If we were to return to the chapter on the most successful esports players, then the players of the OG team are in the first places, who just got most of their money thanks to two wins in The International tournaments with an enormous prize pool. This figure was greatly affected by the covid-19 pandemic in 2020, where the total prize pool of tournaments decreased by $115 million.

Despite this pandemic, this figure confirmed my opinion from the previous figures that although the number of tournaments is decreasing, the prize pools are increasing. This statement is evident in

2021, where the total prize pool of all tournaments was 206 million dollars and the number of tournaments was 4330. Therefore, the author would also lean towards the higher end of the analysis in this forecast, that the total prize pool of all tournaments could reach in 2030 worth around 317 million dollars. This growth would have been much greater if the covid-19 pandemic had not slowed it down. The CARG cap hovers around 4.91%.

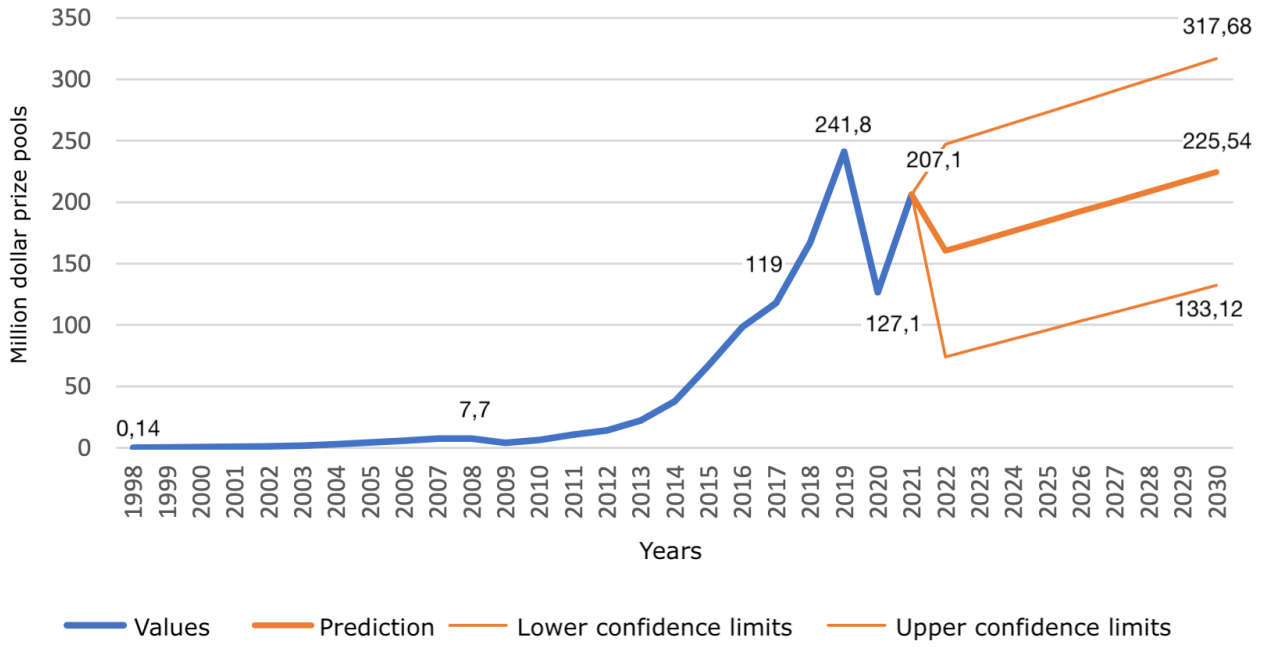

Figure 29. Forecast of the development of prize pools of esports tournaments until 2030 (The author, 2022)

To create a better forecast of the development of the gaming pool, an identical graph is created, omitting the last two years, which were greatly affected by the covid-19 pandemic. This graph shows values of the median forecast bound almost five times larger than the previous graph. The CAGR here is equal to 14.09%, which is a very high number. Personally, the author would expect something between the lower and middle limits.

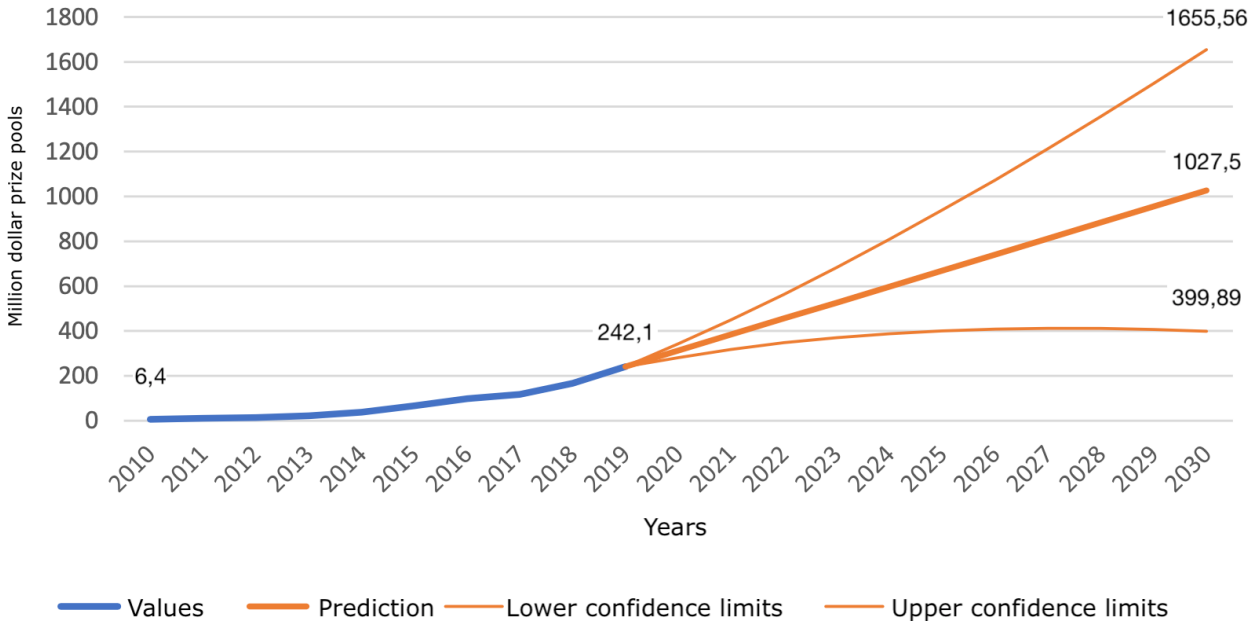

Figure 30. Forecast of the development of esports game funds using data from the years 2010-2019 (The author, 2022)

The following figure shows leading esports channels that broadcast local and some foreign tournaments with Czech commentary. The values given in 2030 are the mean values of the forecast. In the Czech Republic, there are not many channels focused on esports. Last year, a channel called Turbokanál was created, which broadcast a foreign tournament in the Counterstrike game with Czech commentary and in less than two weeks, it collected over 340,000 views. Unfortunately, there has been no stream since then. Some Czech organizations have their channels on the twitch.tv platform where they themselves broadcast the matches of their wards, but these matches usually take place of Czech tournaments. Such channels include, for example, SINNERS_Esports, Entropiqteam or eSuba.

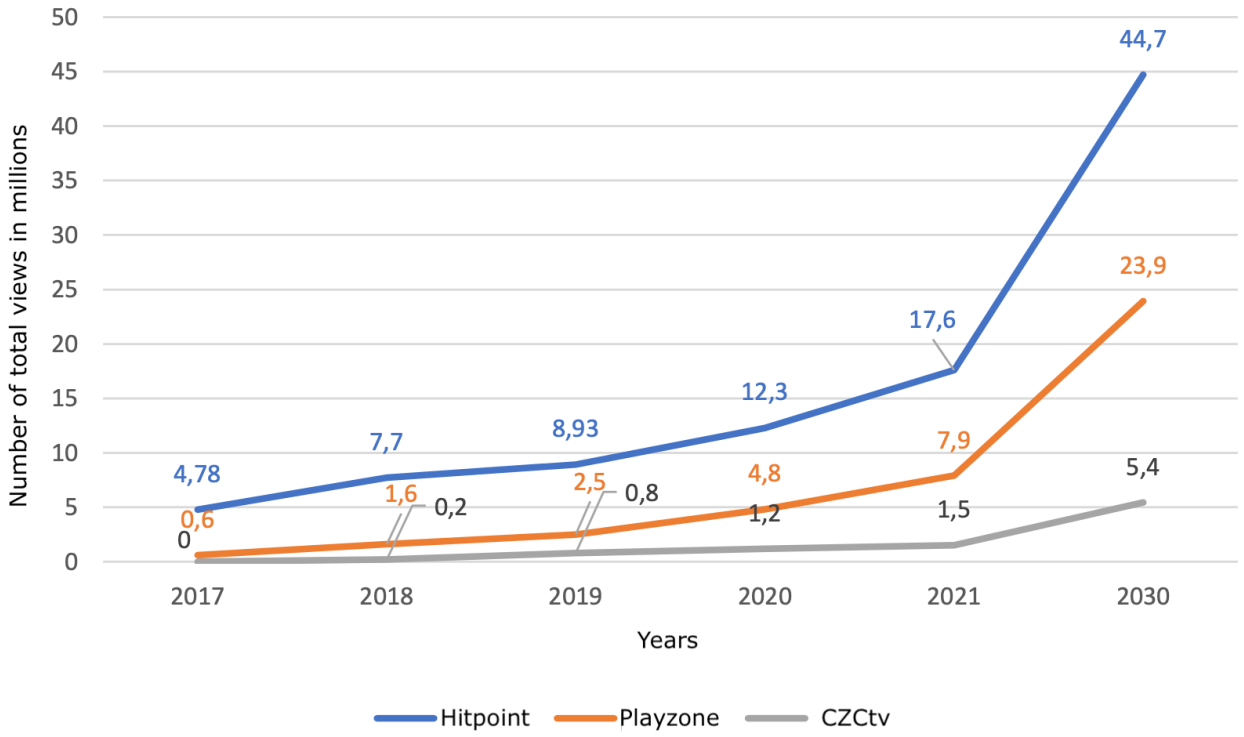

Figure 31. Forecast of the development of total views of Czech esports channels on Twitch.tv (The author, 2022)

5.3 Predictions and Analysis of Future Developments of the Esport Audience

In this subchapter, the author will describe the prediction of the future development of the esports market, including video game market, based on my prediction and market analysis from the previous chapters. It will mainly be about qualitative predictions. That is that the author will use own studied knowledge and try to describe future developments. The author will highlight the basic aspects of the market, where they are heading, how technology is developing, in which direction they are heading or where they are coming from. The author will also describe the current trends and impacts on the economic and social side. At the end of this chapter, the author will try to outline the most current topic and its impact on esports within the context of the covid-19 health pandemic.

The author will analyse the situation based on currently available data from the statistics server Twitchtracker.com. The author will compare how much the average viewership of the Twitch.tv platform has increased. And this both in comparison with previous years and in recent months and weeks. The following figures, which were processed in MS Excel, will help us to understand it.

Firstly, we will have a look at a forecast based on old data that does not assume an economic crisis in the form of a global covid-19 pandemic. At the end, a new forecast will be made, which will already take into account the coronavirus, so we should expect that the follow-up will be higher in the future.

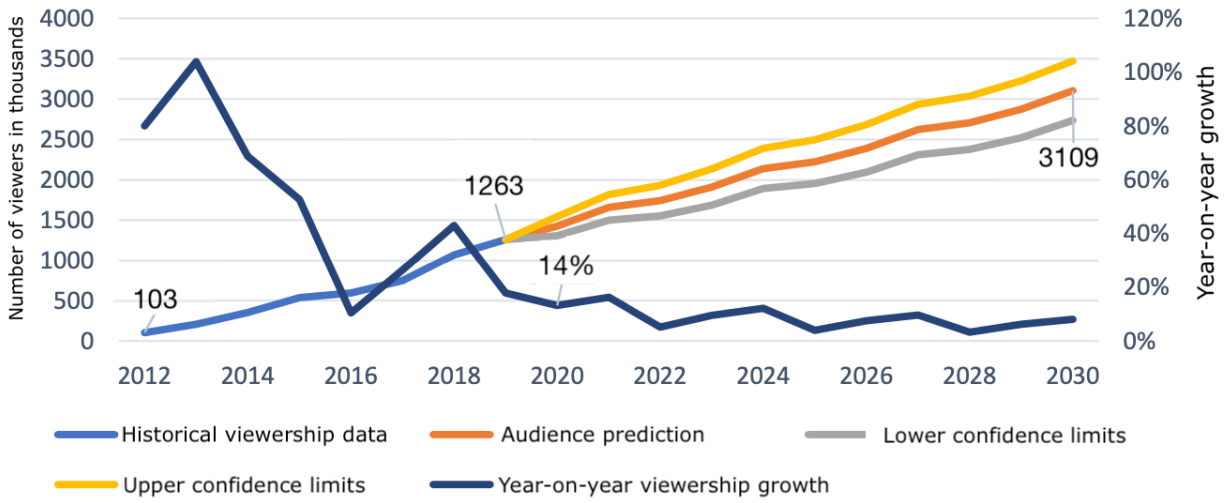

Figure 32. Forecast of Twitch.tv viewership (The author, 2022)

According to the historical development, we would expect that in the optimistic version (yellow) the average number of viewers for one year will be around 3.4 million. This would represent an increase of almost 170% in 10 years. The realistic version (orange) does not represent any smaller numbers and calculates a value of 3.1 million. Finally, the pessimistic version (grey) calculates with 2.7 million viewers. Personally, the author would lean towards the optimistic version or even larger values. An important figure to remember for further analysis and predictions will be year-on-year growth.

In the following figure, the author will take a look at the most recent data for the last few months.

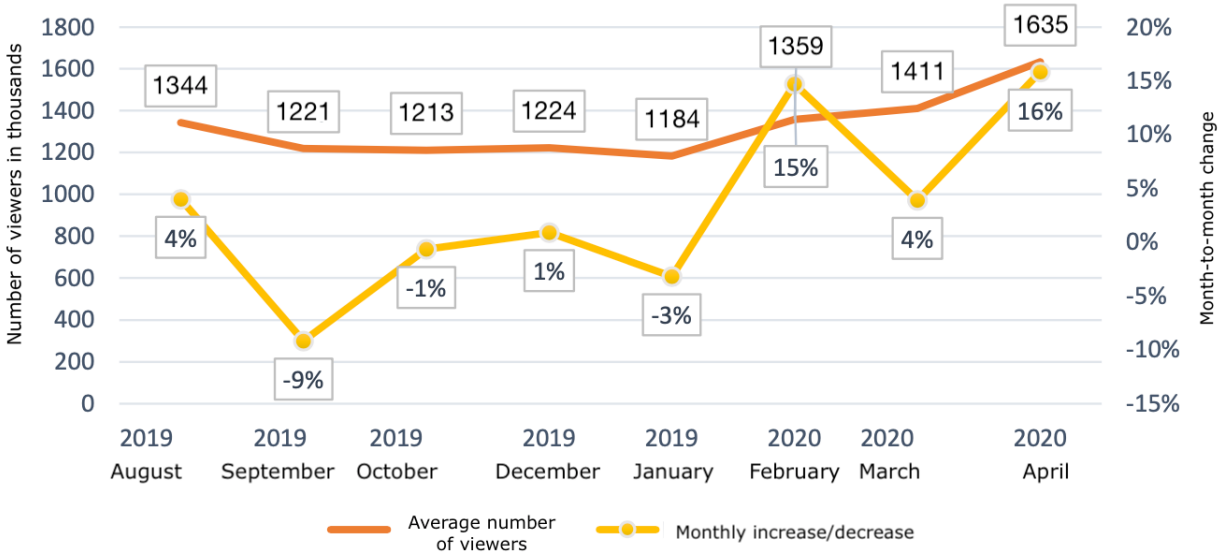

Figure 33. Monthly viewership of Twitch.tv (The author, 2022)

According to the monthly graph, we can already observe in which months it had viewership the biggest fluctuations. The intermonth change connector also helps us with this. If we follow the timeline step by step, we will notice that the very first point, for example the year 2019 in August, records a larger viewership than usual. This is due to the biggest tournaments of the year taking place and at the same time most people aged 15-29 are either on holiday or have free from school and therefore have more time to watch the games. During the following months in 2019, the course of viewership will drop again and will hold a steady line of approximately 1.2 billion viewers. This changes with the arrival of the new year, when big tournaments are held again and new games are launched. And further, we are already entering the time with the occurrence of the coronavirus. In February 2020, we already find a slight increase of 4%, and in March it is up to 16%. The average viewership reached the highest value in history - 1,633 thousand viewers. Following figure just confirm the previously described situation with an even closer analysis, which is divided into weeks.

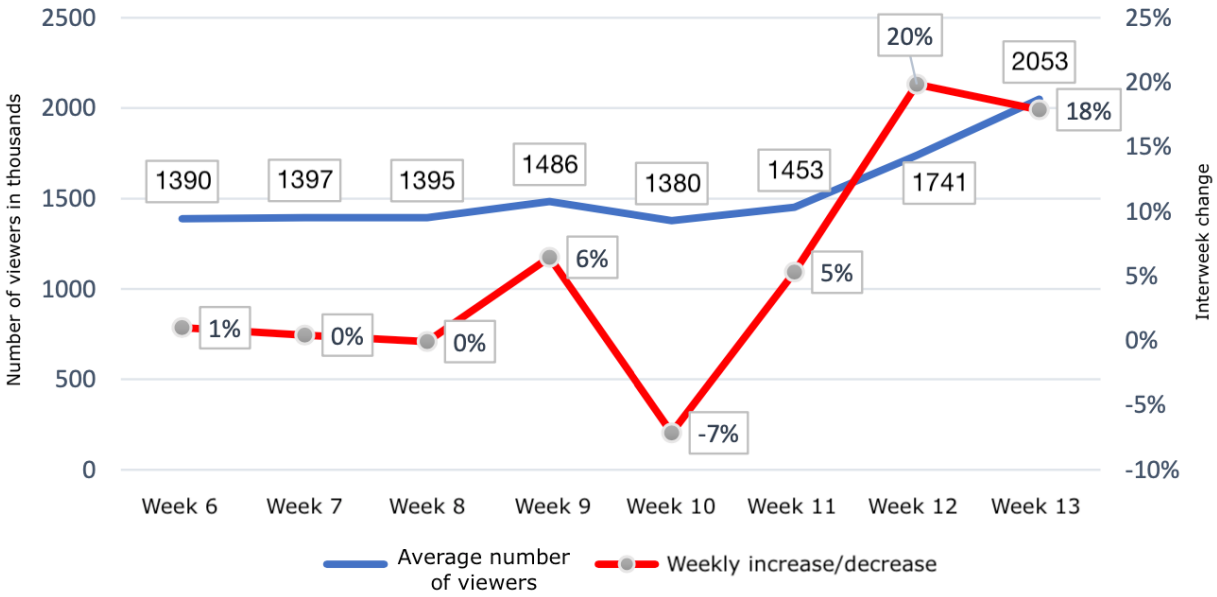

Figure 34. Weekly viewership of Twitch.tv (The author, 2022)

From the figure, you can see how the viewership of the games changes after weeks. For the first six weeks (from February 3, 2020 to March 9, 2020), we see only one swing up (6%) and then immediately down (-7%). This was most likely some kind of competitive event in the world of esports, and these deviations are common within 10% per week. But what is not usual is the fluctuation of the 12th and 13th week (from March 16, 2020 to March 29, 2020), the already well-known date when states began to declare states of emergency and quarantines. Here we see an abnormal increase. The first time in the form of 20% and then 18%. More precisely, in the last 2 weeks, viewership grew by 50% from 1.4 million to 2.1 million viewers.

From next figure, the author will adjust the already calculated forecast of the development of viewership of the Twitch.tv platform until 2030 based on the analyzes performed including covid-19 case.

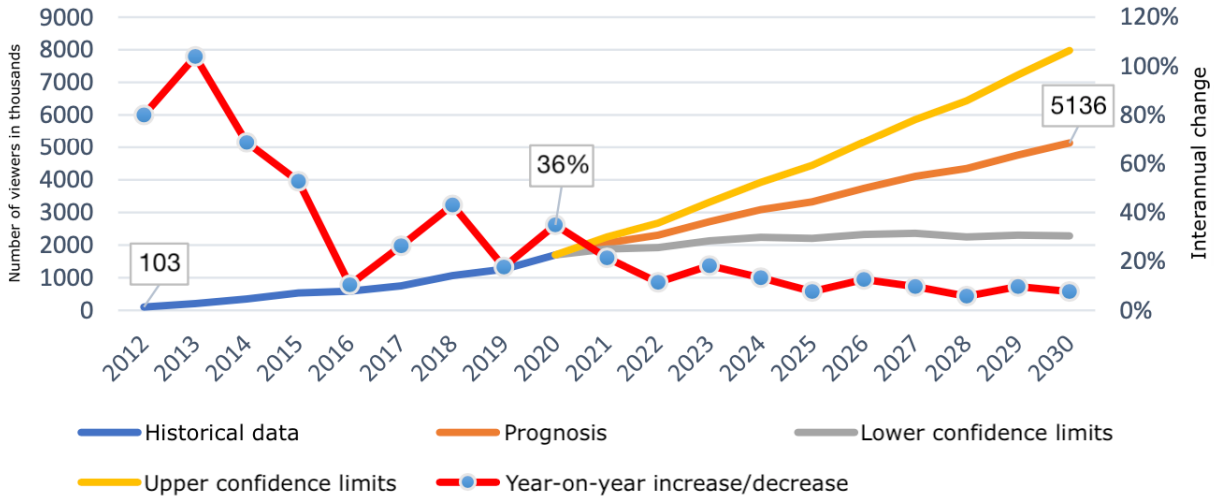

Figure 35. Forecast of Twitch.tv viewership in case of covid-19 (The author, 2022)

The historical data will be the same as in the first prediction case at the beginning of the chapter. The change occurs in 2020, when the author predicts a year-on-year change compared to 2019 of 35% compared to 13%. This is 22% more than expected. Similar development can therefore be expected for other indicators such as the number of tournaments, the number of players or the income of the esports market itself. However, the expected values for 10 years ahead have a much larger variance than the first prediction. This suggests that we cannot say with certainty in which direction the audience will face. If it is just a momentary fluctuation, or the beginning of a new era of esports. In any case, in the optimistic variant (yellow), we expect a value of up to 8 million viewers. The realistic prediction calculates with approx. 5.1 million viewers and the pessimistic (grey) one with not even 2.3 million viewers.

6 Conclusion

The coming years will certainly be exciting for esports as we do not know 100% where its future is headed and we are only guessing with some probability. Many game companies are considering whether their games are a suitable format for esports. Realistically suitable games for competitive play must generally fall under a certain criterion. Let's start by saying, for example, that it is convenient to have a small team of people in the game. Too big team would mean that the winning prize pools are reduced by that and thus there would not be as much interest in the tournaments. This would lead to little incentive among players to devote themselves to the game full-time. Let's also look at game balance. The classification of players and their positions must be based on the same point for everyone. This eliminates unfair competition. Therefore, it is important that certain boundaries are set in the future, through which the game must pass in order to be classified as esports.

6.1 Virtual Reality

The outlook for the future of electronic sports will bring a new competitive environment and new competitions. This will attract further investments, both from new external investors and from existing ones, who will strive for stability and predictability of the competitive environment. The esports industry has great potential to add value to some of the latest consumer technologies. Virtual reality is an example of this. It gives esports viewers the ability to get up close to the players in action. When the author thinks about the future of hardware, since most hardware developers are trying to improve gaming equipment, the author expect to see more powerful graphics cards, lighter mouses, or larger displays in the future because it is the current trend. At the same time, for example, wireless devices are becoming more and more reliable and are starting to penetrate the progaming world as well. However, the future of VR games as a part of esports is much more interesting, as it can really open up a whole new world of competitive gaming environments. VR games could probably be accepted into the Olympics before the regular games. This is purely speculative, but the potential of the VR industry is huge. More VR leagues similar to the ESL VR League will appear in the future as virtual reality devices become more common and accessible for people. The main thing which is currently holding back virtual reality is the fact that some people may get motion sickness from using it. It is still not a flawlessly debugged technology and there are problems such as laggy, glitches, endurance and similar technological matters. However, in time these problems should be solvable, if it is not too late and VR is not banned by legislation.

6.2 Study of Esports

Many schools and universities around the world already offer degrees, diplomas and scholarships for eports businesses, including competitive video game designers and developers. Schools in most countries already have programs and degrees focused on esports, so it is not just a United States or China thing. In the future, more career opportunities will open up for people, not only as esports experts, but also as streamers, event organizers, game developers or marketing specialists. More IT people will also be needed because new methods of cheating are constantly being developed, and therefore new methods of detecting and preventing cheating must be developed. Schools also offer the study of competitive games, where truly motivated individuals can go and fully devote all their time to improving the games. In the future, there should certainly be more of these opportunities, both for study and work.

6.3 Investments in Esports

Investments in esports have advanced significantly in recent years. This is due to the involvement of traditional investors who have used their venture capital to explore diverse investment opportunities throughout the economic system of esport industry. More specifically, the esports industry attracted more than 4.5 billion US dollars in public investment in 2018, which represents a rapid increase compared to 490 million US dollars last year in 2017. This number is still likely to increase in the future with the introduction of franchise leagues, the centralization of teams for esport (including management and support staff), by continuing to grow the audience and thereby raising awareness of esport itself and its culture associated with it. Unfortunately, there are uncertainties regarding the long-term viability of some competitions and potentially successful teams in the future. This could have a negative dampening effect on future esports investment inflows. However, the most demanding entities that make up the infrastructure behind the industry will suffer the most from all of this: game developers, streaming services and ancillary services (in-game communications, analytics services, etc.).

6.4 Risks of Esports

Although the author believe that the electronic market will continue to grow. Also, should be mentioned the potential risks that can disrupt the future economic performance. On the other hand, the author does not believe that these problems and risks, which will be outlined further, will lead to a complete collapse of the market. However, it is still a new industry in which this can happen.

The first obstacle the author would see is that not every popular game will be an esports. Developers usually invest a lot of resources in their games to make them compatible with esports. However, there is no guarantee that all games will be successful and pass. For example, games like Overwatch or APEX Legends may continue to grow in popularity, but may not be viable in top-level competitive gaming. It could be caused, for example, by the fact that the games are not attractive to watch, which is the main risk. Or that the game format is not compatible for professional play. Therefore, if the new popular games do not have enough support for esports, there is a risk of a big drop in viewership of esports. And that, as we already know, will reduce the main income and thus the market will start to stagnate.

Another risk is the longevity of the games. It is one big unknown. Although the games generally seem to be immortal and players continue to play them for decades, despite all the updates, most players get tired of the game and find another one. There is no guarantee that the game will last forever. For example, in recent years we could observe a similar decline of the StarCraft series, which has long been the most popular esport. Consider, for example, aging fans who had a favourite game of their era that they both played and watched. Over time, if the game stops being popular, they will lose interest in it and since they are already old, they are not so interested in discovering new ones and will give priority to responsibilities such as work or family. On the other hand, they may prefer to return to watching other things, such as a traditional sport that remains constant over the years.

A big risk is the very home of electronic sports - East Asia. This represents another potential threat. Esports countries continue to dominate the market. In the future, this could have a negative impact on viewership in regions such as North America and Europe, which are still lagging behind. The best teams, their stars and with them investors and sponsors are leaving with their capital to East Asia. A recent example is the London Overwatch Spitfire team, which fell under South Korean ownership.

In the future, there are two other possible obstacles that developers will have to deal with and find solutions for. First, the community, is quite young and somewhat immature and toxic. Developers are already facing this problem and it is a problem to fight it. Players cannot control their anger and curse each other and others in the chat, even for a small mistake of a teammate. There is currently no successful solution, and if this does not change in the future, it will have a really negative impact on esports. Another problem is gambling. Gambling is very difficult to control. It may happen that the gambling values will be too high and this would create the possibility of manipulation and fraud with the players.

6.5 Evaluation of Own Prediction

According to the forecast, the esports and video game market should not decline for the next couple of years. On the contrary, forecasts showed that it should grow several times. The greatest danger for this market in the future could be economic factors such as the increase in the prices of materials for the production of consoles, game devices and electronics caused by the covid-19 pandemic, the currently ongoing war in Ukraine, the lack of graphics cards, which is caused by a large amount of mining cryptocurrency, possible internet connection.

On the contrary, the modernization of today indicates that the esports market will only move forward. The use of game simulators in the army to practice combat missions, education through games in schools, interactive whiteboards, virtual reality, which is advancing year by year and is now available to the public at such a level that the game captures the players' bodies from head to toe, including finger movements. The improvement of the mobile Internet network, which already reaches the level of 5G in some territories, allows players to play any mobile games from anywhere, without various cuts and slowing down of the game.

However, it is no different from the point of view of esports. Forecasts here indicate steady growth in both esports viewership and the number of players. We could say that esports viewership has almost quadrupled in the last ten years. Nowadays, a lot of people live by esports and the events surrounding it, which is still incomprehensible to some people of the older generation. In the Czech Republic, this branch of esport is not so popular yet, but the growth is also noticeable here. Large companies in the Czech Republic such as Alza, CZC, Sazka, Puma, Intel and many other well-known companies started investing in esports. At the world level, sponsors are such as BMW, Mercedes-Benz, Redbull, Monster or even Nike.

In my opinion, esports has a pretty big and significant future from an economic point of view. In the next three subchapters, the author will take a look at three possibilities that could arise – basic, pessimistic and optimistic scenarios.

6.5.1 Basic Scenario

According to the base scenario, the viewership of esports in 2030 should be around 830 million followers and the value of the esport market should be around 266 billion dollars. The viewership of esports will also evolve according to the growth of streaming platforms, which is also very positive. In 2030, the viewership of twitch.tv will be equal to 9.8 billion viewers according to the base

scenario. Which is an increase of 7 billion viewers from 2021. However, the audience cannot grow indefinitely, and some markets may already be overcrowded. According to the figures mentioned earlier, majority of the players are in Asia and Oceania. Here, the market could quickly be swallowed up and slow down the growth of viewers, which would give the opportunity for growth to other regions. On the other hand, these continents have a high probability of incorporating esports into mainstream sports, and this would increase the overall video game and esports market.

However, esports still cannot match regular sports in the number of followers. One reason may be that the older generation is more familiar with normal sports such as football, hockey, basketball and so on. Esports will also move into the mainstream as time goes on with today's aging generation. Another reason why esports cannot be compared to normal sports is the viewership on television. Esports is also far from reaching viewership due to the absence of television among younger people who already watch everything on the Internet.

A big advantage of esports could be large prize pools, which could reach the 1 billion US dollar mark in 2030, according to the forecast, if a significant situation such as the covid-19 pandemic did not occur. With growing prize pools, esports tournaments are also expected to grow, which the author does not expect based on the development of tournaments today and from the point of view of convenience for both the organizers and the players themselves, who would rather compete in fewer tournaments for more money.

My overall assessment of this scenario is the most likely of the three mentioned. The created forecasts do not indicate that one should count on a pessimistic scenario, because they see growth in all forecasts. On the other hand, in the optimistic scenario, things like the number of people on the planet, the preferences of different age groups, possible restrictions for this market in the future or the saturation of markets in different regions are not taken into account.

6.5.2 Pessimistic Scenario

According to my pessimistic scenario, the viewership of esports in 2030 could be around 750 million viewers, and Twitch.tv would still remain the primary site. The value of the esport market would only be around $250 billion. This scenario, in my opinion, can occur when developers stop releasing new updates to esports games, or developers start releasing game changes in such a way that players gradually stop enjoying the game, and this will lead to the decline of this game. A similar scenario has already happened to the Overwatch game, for example, which was stopped by around 40 million players within three years (escharts.com, 2022). Another possible pessimistic scenario may arise as

a result of tightening the rules on viewing platforms such as Twitch or YouTube, where there could be the possibility of age restrictions for viewers, a ban on broadcasting games in which violence appears or the complete cancellation of these platforms. Fortunately, according to historical analysis, these scenarios are very improbable, and the esport market, together with video game market, should continue to grow.

6.5.3 Optimistic Scenario

According to optimistic scenario, where the author will assume only the best, but sometimes unrealistic forecast, esports viewership in 2030 should reach 831 million viewers, although the main esports streaming platform should reach 15 billion viewers. From this, the author would conclude that the total viewership limit of esports could easily climb up to the 1 billion followers mark. The esports could also reach that number due to its great popularity in Asia, where it could become a mainstream sport, which would greatly increase its viewership. Another potential increase in viewership could be the expansion of esports to countries where it is currently not as popular. The total value of the esport industry can be equal to 275 billion dollars. This number could be reached due to better availability of gaming devices and improvement in their quality. The author can already observe this scenario with the game market on mobile devices, where this market should be equal to 184 billion US dollars.

Also, with game pools in esports tournaments, which the author would expect to be around $1.65 billion, it would attract a large number of new players “hungry” for these sums. With the growth of esports, tournaments are also expected to grow.

6.5.4 Summary

Summarize this, it is a beneficial period with great potential for esports market, even if it is also limited in individual directions. By this, the author means, mainly distribution networks or the promotion and development of new technologies related to it.

According to the forecast the author has made, which was focused on the current viewership data of the Twitch.tv platform, the author can state that the viewership will definitely increase. At the end of March 2020, it is moving in a 20% increase. The annual prediction even shows that the market was up to 22%. At the same time, however, the data show a large dispersion, due to which we have to take the situation in other perspectives. It is possible that the esports market will not withstand

this situation, as well as other industries. But it definitely has better conditions for survival than other industries.

To sum it up, the positives definitely prevail as a result, and simply put, the esports industry is one of the few that will permanently benefit from the covid-19 pandemic, and it is only a matter of time before companies realize this and take advantage of it.

7 Discussion

In the last decade, the esports market, video game market and video games have become part of the life of more than one billion population of the world who spend time playing and watching electronic sports. From the initial enthusiasts and innovators, a huge segment of the market emerged, which began to compete with other markets such as cinematography and music. Esport and video games are no longer seen as mere entertainment or a waste of time. Hobby players soon became professional "athletes" on the electronic scene. Their frequency in society is becoming more and more widespread.

The main goal of the master thesis was to create forecasts for the development of esports. Projections were made up to 2030, using historical data from various sources. The used data was collected from several quality internet sources and then summarized. This is because it is a very fast-growing market, which has great potential in the future both for esports players and for potential sponsors and companies that would enter the market.

A key part of the master thesis was to create forecasts, from which the pessimistic, optimistic and basic scenarios of the possible development of esports are described. From these forecasts, it can be concluded that even according to the pessimistic scenario, the esports market will continue to grow. However, the most likely scenario will range between the basic and optimistic scenario, where the value of the esport market should be around 270 billion US dollars. By 2030, viewership of this esport will almost double its current value. The value of the winning funds will climb to at least one billion US dollars, which will attract a lot of new viewers to the main streaming platform Twitch.tv. The target group will still be mainly the younger generation, but thanks to the rapidly growing market, esports will also reach the subconscious of older generations.

The predicted values are as follows. Esports will grow to a size of 2.3 billion US dollars. The biggest part will be income from sponsors – 36%, 33% will be media rights, 14% will be donations, and the remaining percentages will be divided between advertisements, merchandise and tickets. The logistic trend predicts that we should see up to 2.8 billion video game players in the next few years. In the development of total prize pools, at first glance, a large future dispersion can be seen, and the most probable given quantity to which we can approach in the future (in 2030) is approximately 900 million US dollars with a predicted number of 8,871 tournaments per year. In the future, we could count on an optimistic version of 1.7 billion esports viewers, which represents a threefold

increase in next few years. The last prediction is investment development. We can state with certainty that investments will increase both in number and size. The estimated CAGR is 7.3% in the outlined situation.

As individual esports teams grow, so will their needs. Which will open up opportunities for new or vacant job positions on the esports market, such as managers of esports players, coaches, mental coaches, team health workers or fitness coaches. As the popularity of this market increases, so do the demands on teams and individual players who are forced to perform better. As a result, they do not have time to focus on things other than playing and therefore need the help of other people.

A big advantage of esports is the variety of games in which players can compete. The figure mentioned in master thesis shows the largest age group of players between the ages of 21 and 30. However, the 10 to 20 and 31 to 40 groups are in second place, which shows us the diversity of this esport. In games where precision and speed are needed, younger players excel. In the opposite case, where patience and experience are needed, older players excel.

From the set goal, it can be recommended to potential participants in the esports market to focus on the mobile games market, which has gained a large increase in popularity in recent years. From a player's point of view, it can be concluded that the biggest income for a player can be achieved in the Dota 2 game, where is a lot of competition and getting among the best teams will not be the easiest task. A great opportunity on the Czech esports market can be found in a streaming channel that would transmit foreign esports tournaments of all kinds with Czech commentary. For potential new streamers on the Czech scene, it is recommended to focus on the mobile esports market, which is not yet so well known here, and the growing future of this esports industry can be read from the analyses.

Since the popularity of esports changes a lot, it would be very interesting to make forecasts every year and observe its changes, which can be caused similarly to the covid-19 pandemic. This pandemic has greatly helped the viewership of esports and brought it to the forefront. An interesting consideration is also the inclusion of esports in the Olympic games, which would cause further huge growth. Some attempts to include esports in the Olympics have already been made, but unfortunately the appropriate esports games, which are the most popular in this market, were not used. With the right games chosen, it is likely that esports could become a regular part of the Olympics.

The author could consider how the covid-19 pandemic might have influenced growth and at the same time, forecast a scenario where covid-19 policy changes in the year 2022 might affect forecasting. This reasoning is based on the fact that many industries are experiencing drastic changes with the near end of covid-19 policies around the world. Realistically, forecasting based off of trends during the covid-19 pandemic should be re-evaluated post-covid-19. The term “the new normal” was pretty common in everyday discussions during the covid-19 pandemic. There will logically be a “new normal” with the return to pre-covid-19 policies that affect the amount of time people have at home to consume entertainment such as esports.

The results point to the significant growth of esports on a global scale. Competitive gaming is becoming a hit in these days. The capital, the volume of game titles, streaming platforms, sponsors and the number of viewers are increasing. The ever-increasing popularity plays a vital role here. It brings new viewers and new players at the same time. This contributes to the growth of the entire industry. In view of potentially high profits, investors and sponsors support it even more. Development influences each other with technological innovations. The author sees great potential in esport, mobile video games and virtual reality. Estimates show that esports will continue to develop at a rapid pace and create many more innovative subjects and job opportunities. It is reasonable to expect that the esports industry will grow for at least the next five to ten years. In the authors view, the rate of growth will slow, but the growth itself will remain. The author can support this with the idea that more and more people will naturally get into esports.

The author could also consider the need for more research of the esport industry. The video game industry is the larger “umbrella” industry that encompasses the esport industry. This distinction could use more research to correlate growth factors from one industry to the growth factors of the larger industry of video game entertainment.

The output of this master thesis work points to the importance of esports in the current world and its potential development. The author would be very happy if this master thesis work support future studies and lead to a better understanding of the phenomenon of esports or to its further expansion.

Overall, using a mix of multiple quantitative and logistic methods to verify the validity of the results could have been used in this master thesis. Some final results can seem unrealistic and also lacks more comparisons with theoretical starting points. The master thesis focuses on the global markets in its analysis, but specifies sources on the Czechia market to indicate potential business opportunities for investors in that specific market. This holds a potential bias, because it does not maintain a

global perspective (by suggesting investment in the Czechia market), as the majority of the analysis does. Also, the size difference of the Czechia market to the global market size should be considered in order to counter potential bias. High confidence can be maintained with the global forecasting figures and can be used as a tool for investors as a benchmark. Potential stakeholders of the Czechia esports industry should consider the market statistics collected specifically about the Czechia esports market to be accurate with high confidence. The same audience should consider investment suggestions with low confidence. Further research in specific esport markets would strengthen this master thesis research questions.

References

Anson M.; Fabozzi F.; Jones F. (2010). *Příručka tradičních a alternativních investičních nástrojů: investiční charakteristiky a strategie* [Handbook of Traditional and Alternative Investment Instruments: Investment Characteristics and Strategies]. John Wiley & Sons. page 489. ISBN 978-1-118-00869-0.

Attwood, E. (2015, April 1). *E-Sports Athletes Looking for Recognition - Athletic Business*. [online]. https://www.athleticbusiness.com/sports-media/e-sports-athletes-looking-for-recognition.html

Bosman, S. (2020, August 12). *The Way Consumers Interact with Games Is Changing* [online]. https://newzoo.com/insights/articles/consumer-engagement-with-games-is-changing-gamer-segmentation-personas-gender-age-demographics

Brightman, J. (2015, January 29). *Twitch reaches 100 million viewers per month* [online]. https://www.gamesindustry.biz/articles/2015-01-29-twitch-reaches-100-million-viewers-per-month

Carpenter, N. (2016, November 30). *Esports "God" Faker's new SK Telecom T1 contract estimated by insider to be worth $2.5 million.* [online]. https://archive.esportsobserver.com/fakers-new-sk-telecom-t1-contract

Coolican, H., (2009). *Research Methods and Statistics in Psychology*. 5th Edition. London: Hodder Education. ISBN: 9780203769669

Daniels, T. (2020, August 19). *CSM: Why more football clubs are transitioning into esports*. *Insider Sport* [online]. https://insidersport.com/2020/08/19/csm-why-more-football-clubs-are-transitioning-into-esports

Deloitte. (2021, October 21). *Building Sustained Economist Success and Resilience in the Esport Ecosystem.* [online]. https://www2.deloitte.com/us/en/insights/industry/telecommunications/esports-in-europe.html

Edwards, T. (2019). *Esports: A Brief History* [online]. http://adanai.com/esports/

Esport.cz (2020, March 19). Esport v číslech [Esport in numbers], [online]. https://www.esport.cz/vznikla-cinska-dota-2-asociace-profesionalu

Esportearnings.com. (2022). *Top 100 Highest Overall Earnings.* [online]. https://www.esportsearnings.com/players

Esports-news.co.uk. (2022, June 14). Esports Kings: Some of the Most Successful Teams from the Last 5 years. [online]. https://esports-news.co.uk/2022/06/14/esports-kings-successful-teams-from-last-5-years/

Esposito, N. (2005, January). *A Short and Simple Definition of What a Videogame Is*. [online]. https://www.researchgate.net/publication/221217421_A_Short_and_Simple_Definition_of_What_a_Videogame_Is

Fobel. P. (2002) *Aplikovaná etika. Teoretické východiská a súčasné trendy*. [Applied ethics. Theoretical starting points and current trends] HONNER, 2002. ISBN 80-968399-5-0.

Good, O. (2012, October 19). *Today is the 40th Anniversary of the World's First Known Video Gaming Tournament* [online]. https://kotaku.com/today-is-the-40th-anniversary-of-the-worlds-first-known-5953371

Hayward, A*. (*2019, July 22). *Intel Esports Marketing Manager on Keeping $1M CS:GO Grand Slam "Special" with Rule Changes* [online]. https://archive.esportsobserver.com/iem-chicago-george-woo/

Heinzman, A., (2022, August 2). *What are Esports and Why Do People Watch Them?* [online]. https://www.howtogeek.com/415742/what-are-e-sports-and-why-do-people-watch-them/

Hendl, J. (2008). *Kvalitativní výzkum: základní teorie, metody a aplikace* [Qualitative research: basic theory, methods and applications]. Praha: Portál, 2008. ISBN 978-80-7367-485-4.

Hindls, R., Hronová, S., & Seger, J*.* (2006). *Statistika pro ekonomy* [Statistics for economists]. Praha: Professional Publishing, 2006. ISBN 80-864–1999-1.

Hindls, R., Novák, I., Hronová, S., (2000) *Metody statistické analýzy pro ekonomy*, [Methods of statistical analysis for economist]. Praha: Management Press 2000. ISBN 9788072610136.

History.com (2017, September 1). *Video Game History*. [online]. https://www.history.com/topics/inventions/history-of-video-games

Hosmer, D. W., Lemeshow, S. (2000): *Applied Logistic Regression*, Second Edition. New York: John Wiley & Sons, 2000. 375 s. ISBN 0-471-35632-8.

Chaloner, P. (2015). *A Guide to Becoming a World-Class Esports Broadcaster* [online]. https://www.docdroid.net/NqR8Emh/talking-esports-final-2.pdf#page=89

Chapman, J. (2017). *Esports: A Guide to Competitive Video Gaming*. [online]. https://www.toptal.com/finance/market-research-analysts/esports

Chikhani, R. (2015, October 31). *The History of Gaming: An Evolving Community* [online]. https://techcrunch.com/2015/10/31/the-history-of-gaming-an-evolving-community

Klugar, M., 2015. *Systematická review ve zdravotnictví*. [Systematic review in healthcare]. Olomouc, 2015. ISBN 978-80-244-4785-8.

Li, R. (2016). *Good luck, have fun: the rise of eSports*. New York: Skyhorse Publishing. ISBN 9781634506588.

Mallya, T. (2007). *Základy strategického řízení a rozhodování* [Basics of strategic management and decision-making]. Praha: Grada Publishing a.s. 2007. ISBN 9788024719115.

Mazique, B. (2018). Entertainment Software Association [online], https://www.theesa.com/wp-content/uploads/2021/03/ESA_EssentialFacts_2018.pdf

Mediaguru (2020). *Výzkum: Esport v dospělé populaci sleduje 900 tisíc lidí*. [Research: 900,000 people watch esports in the adult population] *MediaGuru.cz, 2020* [online] https://www.mediaguru.cz/clanky/2020/04/vyzkum-esport-v-dospele-populaci-sleduje-900-tisic-lidi/

MediaKix (2020) *Time spent on Twitch.tv* [online]. https://earthweb.com/twitch-statistics/

Mmogames.com (2021) *Number of video gamers*. [online]. https://www.mmogames.com/wp-content/uploads/2018/05/Number-of-Gamers-Worldwide.png

Newzoo.com (2021, January 22,a). *Newzoo's Esports Trends to Watch in 2021* [online]. https://newzoo.com/in- sights/articles/newzoos-esports-trends-to-watch-in-2021/

Newzoo.com (2017, May 3,b). *Male and Female Gamers: How Their Similarities and Differences Shape the Games Market* [online]. https://newzoo.com/insights/articles/male-and-female-gamers-how-their-similarities-and-differences-shape-the-games-market

Newzoo.com (2019, February 14,c). *More People Are Streaming on Twitch, But YouTube is the Platform of Choise for Mobile Game Streamers.* [online]. https://newzoo.com/insights/articles/more-people-are-streaming-on-twitch-but-youtube-is-the-platform-of-choice-for-mobile-game-streamers

Newzoohq.medium.com. (2021, December 28). *The Games Market and Beyond in 2021: The Year in Numbers.* [online]. https://newzoohq.medium.com/the-games-market-and-beyond-in-2021-the-year-in-numbers-38206842216

Rachita, R. (2021, October). *Esport Market Statistics: 2030* [online]. https://www.alliedmarket-research.com/esports-market-A14210

Sobola, M. (2019). *Tournament Cyberathlete Professional League – Chanse for everyone* [online]. https://www.betarena.cz/rubriky/sportovni-clanky/esport-hry-tymy-ligy-a-vysledky-turnaju_4815.html

Statista.com (2022a). *Leading professional eSports teams worldwide as of November 2021, by total prize money won.* [online]. https://www.statista.com/statistics/954410/highest-winning-esports-team

Statista.com (2022b). *Most followed teams on Twitch worldwide in August 2022.* [online]. https://www.statista.com/statistics/1133134/followed-teams-twitch

Statista.com (2021*, November 19, c). Leading Professional Esport Teams Worldwide as of November 2021, by Total Prize Money Won.* [online]. https://www.statista.com/statistics/954410/highest-winning-esports-team/

Statista.com (2022, July 5, d). *Leading eSports tournaments worldwide as of July 2022, ranked by overall prize pool.* [online]. https://www.statista.com/statistics/517940/leading-esports-tournamets-worldwide-by-prize-pool

Statista.com. (2022, July, e). *Downloaded Games – Worldwide.* [online]. https://www.statista.com/outlook/dmo/digital-media/video-games/download-games/worldwide

Stegner, B. (2022, April 14). *The 7 Best Gaming News Sites and Game Review Sites* [online]. https://www.makeuseof.com/tag/10-websites-latest-game-reviews-gaming-news/

Strivespornosrhip.com (2020). *Global Esports Market Report.* [online]. https://strivesponsorship.com/wp-content/uploads/2020/03/Global-Esports-Market-Report-2020.pdf

SuperData.com (2021, January 6). *Digital Games and Interactive Media earnings rose 12% to US$139.9 Billion in 2020.* [online]. https://g-mnews.com/en/digital-games-and-interactive-media-earnings-rose-12-to-us139-9-billion-in-2020/

Štědroň, B. et al. (2012) *Prognostické metody a jejich aplikace* [Prognostic methods and their applications]. Praha: C.H. Beck, 2012. Beckova edice ekonomie. ISBN 978-80-7179-174-4.

Tassi, P. (2015, September 2). *Jimmy Kimmel Made Fun of Streaming and Proved Gamers Can't Take a Joke* [online]. https://www.mandatory.com/culture/896997-jimmy-kimmel-poked-fun-youtube-gamers-people-inevitably-sent-death-threats

Taylor, T. (2015) *Raising the Stakes: E-Sports and the Professionalization of Computer Gaming*. The MIT, Press 2015. ISBN 978-026-2017-374.

Twitchtracker.com (2019a). *Average viewership and average number of channels between 2012 and 2019.* [on-line]. https://twitchtracker.com/statistics/viewers

Twitchtracker.com (2022b). *Twitch Top Streamers*. [on-line]. https://twitchtracker.com/channels/ranking

Urbánek, T., Denglerová, D., Širuček, J. (2011). *Psychometrika. Měření v psychologii*. [Psychometrics. Measurement in psychology]. Praha 2011, Portál. ISBN: 978-80-7367-836-4

Vaštíková, M. (2008). *Marketing služeb: efektivně a moderně* [Marketing services: efficiently and modernly. 1st edition]. Praha: Grada, 2008. ISBN 978-80-247-5037-8.

Vojtíšek, P. (2012). *Výzkumné metody: Metody a techniky výzkumu a jejich aplikace v absolventských pracích vyšších odborných škol.* [Research methods: Research methods and techniques and their application in graduate theses of higher vocational schools]. Praha: ESF, 2012. ISBN 978-80-905109-3-7.

Wegotthiscovered.com. (2021, July 18). *How Much Do Streamers Make?* [on-line]. https://wegotthiscovered.com/tv/how-much-do-streamers-make/

Wijman, T. (2020, June 5). *Three Billion Players by 2023: Engagement and Revenues Continue to Thrive Across the Global Games Market.* [online]. https://newzoo.com/insights/articles/games-market-engagement-revenues-trends-2020-2023-gaming-report

Wijman, T. (2021, May 6). *Global Games Market to Generate $175.8 Billion in 2021; Despite a slight Decline, the Market is on Track to Surpass $200 Billion in 2023.* [online]. https://newzoo.com/insights/articles/global-games-market-to-generate-175-8-billion-in-2021-despite-a-slight-decline-the-market-is-on-track-to-surpass-200-billion-in-2023

Wolf, J. (2018, May 22). *Epic Games commits $100 million for Fortnite competitions* [on-line]. https://www.gamereactor.eu/epic-games-committing-100-million-usd-to-fortnite-esports/