Emergence of Esports and unique digital products

Milosavljević, Igor

University of Zagreb
Faculty of Economics and Business
Master in Managerial Informatics

Emergence of Esports and unique digital products

Master Thesis

Igor Milosavljević, 00675204

Mentor: Mario Spremić, PhD

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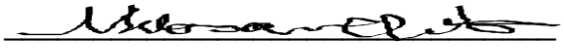
Student signature 

Table of contents

1.INTRODUCTION

1.1 Topic and Goals of the Thesis

The topic of my thesis will explore the development of Esports as a global phenomena and the digital products that came along with the phenomena. „Esports pertain to electronic sports which are broadcasted digitally through various streaming services most notably Amazon Web Services the most prominent cloud computing/streaming services available. The electronic component of Esports is not only its digital broadcasting but also digital arenas in which the participants of the sports compete in. Controversially, the participants do not participate in traditional sports but in video games some of which are considered national sports in some countries“[1]. The emphasis of this thesis will be on how renowned companies and new comers participating in this market have found success with promoting and innovating their physical products, new digital products, incredible returns on investments (ROI) and some of the highest conversion rates recorded on web-shops. The thesis will also cover new platforms that are a result of emerging technologies which offer products that are innovative, have no competition and are ahead of the legal systems of various countries.

The first goal of the thesis is to elaborate concepts of digital products, their digital business models (subscription, freemium, one time payments, etc...), Esports, Esports infrastructure and Esports participants.

Furthermore, this thesis will analyze why world leading companies such as Nike, Adidas, American Express, Gucci, Louis Vuitton, BMW, NBA, IBM found it essential to participate in this market, why did these companies appoint IT, marketing and E-commerce departments to Esports and what are some of their results.

Finally, this thesis will demonstrate the dangers of digital products especially the ones created in the Esports industry, how these products bypassed the existing laws that protected customers and will showcase new laws passed solely for the purpose of regulating digital products.

[1] Bozorgzadeh A, 2020- T*he curious case of Amazon's deep plunge into the Esports industry.* Available from*:* https://venturebeat.com/2017/03/12/the-curious-case-of-amazons-deep-plunge-into-the-esports-industry/

1.2 Explanation of methodology

In order to fulfill the before mentioned objectives, the methods used were: analysis of literature (primary and secondary data), statistical interpretation of public data from other previously conducted research on regional levels (standard deviation, means, standard errors), graphical interpretation of data and analyzing data samples.

A wide variety of literature acquired from: academic works, scientific papers regarding similar topics, analysis from participants, and experts in the field and associated fields.

1.3 Structure of the Thesis

The structure of the thesis begins by explaining key concepts and technologies mentioned in this thesis in order to make further research and convoluted topics clearer. Before defining digital products and Esports, the term Digital Economy will be defined as it is the premise for all e-commerce activities and transactions. Following the topic of digital economy, the term digital business model will be explained along with digital services which will lead into one of the main topics of the thesis which is digital products and Esports.

Moreover, models of digital products will be discussed, case studies analyzed and finally how digital products are combined with Esports. This part of the thesis will cover the evolution of Esports, what gap did this industry fill and compare it to traditional sports.

Moving on, the thesis will cover unique digital products and new transaction methods that were a result of the increasing popularity of Esports and the rapid development of the gaming industry. This part will consist of case studies of famous companies that invested in Esports, innovative use of digital technologies in webshops that offer digital products and digital products that were ahead of the consumer protection laws.

Before the thesis is concluded, the case studies will be analyzed and their differences and similarities compared with one another. The conclusion will cover the chapters and definitions made in this paper followed by comparisons of Esports to sports and future predictions of the technologies used.

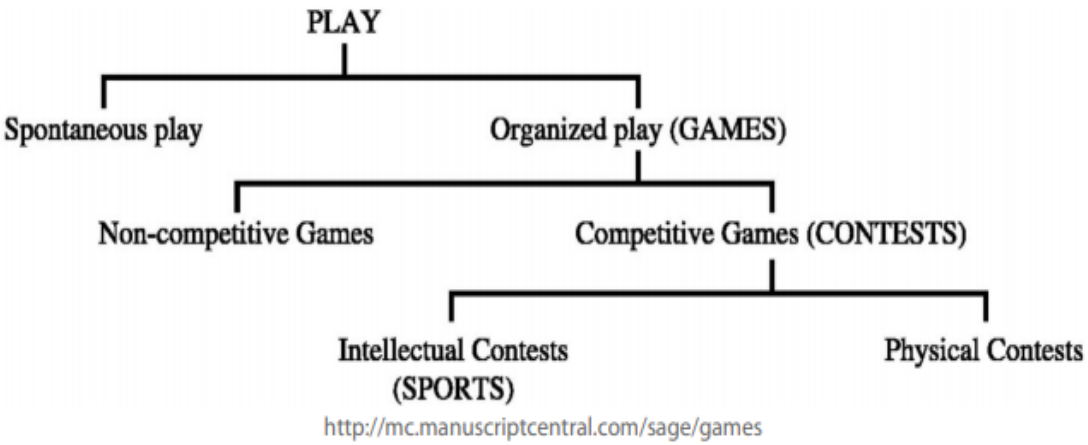
2. LITERATURE REVIEW ON ESPORTS AND DIGITAL PRODUCTS

Esports and the digital products that occurred as a side effect of the Esports phenomenon have grabbed the attention of many companies that had nothing to do with the industry but chose to invest in it due to its incredible potential. Papers that are selected for review of conducted research highlight the rapid growth of Esports and digital business models that encompass the advantages of investing in Esports and similar digital products. The second part of this chapter presents the predictions made regarding the Esports industry where many were confident of the rapid growth due to emerging technologies improving the immersive experience and making it feel more authentic while handling the massive server traffic caused by millions of players. Finally, the third part of this chapter presents the current numbers regarding average spending, time spent participating in Esports, return on investment in the industry and most importantly viewership over the years. These statistical datasets will be analyzed and then compared to the predictions made in the previous chapter.

2.1 Review of similar conducted research

Profesor Jason G. Reitman and co-authors Je Seok Lee from the University of California wrote a research paper where they define Esports as an authentic sport with all of the competitive elements that a sport needs to fulfil. The main motivation for their research was the fact that Esports in 2018 had more viewers than some of traditional sports that were being aired and the way those viewers were receiving the content.[2]

Figure 1- Structural representation of sports



[2] Reitman, Jason & Anderson-Coto, Maria & Wu, Minerva & Lee, Je Seok & Steinkuehler 2019, Constance. Esports Research: A Literature Review. Games and Culture. 155541201984089. 10.1177/1555412019840892.

Figure 1. shows the Gutmmans model of modern sports which was published in 2004 where it classifies non physical contests as sports. Despite both being classified as sports there are organizational and business differences between the two. In contrast to traditional sports, Esports is an industry which pushes its popularity. It is imperative to classify games such as the American and European football at the professional level as highly industry-motivated and even federations, such as FIFA, need to follow the market rules, but a sport such as football is not industry-driven. Sports like football have been developing during a long period of time and were created by a group of individuals playing the game and this is why the rules and standards of sports have changed and evolved. This is the distinctive difference from Esports, because any Esport is practically a video game title, and that video game is developed, maintained and steered by the video game developer. Furthermore, the video game developer is the judge, jury and executioner that monitors the video game. Because of this any game developer like Riot games with an Esports title has the ability to change the game, release new content, and ultimately shut down the servers and kill the game. Most commonly the video game developer is a business, with a board of directors steering the direction, it has to follow the company guidelines, and theoretically , Riot games could shut down its League of Legends game tomorrow. Football federations and other sport organizations are unable to stop any player from playing football or other sports .[3]

2.2 Analysis of predictions made in previous research

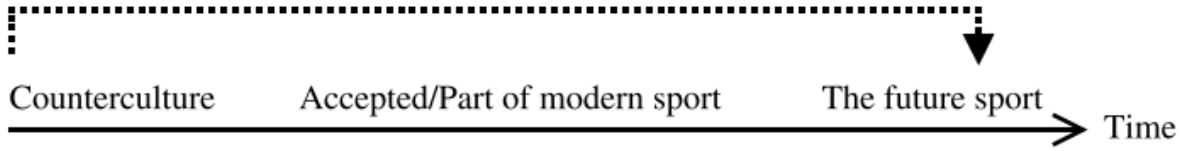
Korea was the pioneer when it came to Esports due to their culture immediately accepting Esports and hosting large events with immense popularity. This made China follow that example and invest heavily in Esports. The research from the Beijing Union university in 2010 concluded with a SWOT analysis of Esports and their development. The strength component focused on the Chinese incredible network coverage which at the time covered 61.4% of the country which is detrimental to participating in Esports. Other strengths were considered to be the emergence of E-stars through the competitive environment that would serve as role models to the population. The main weakness was that Chinese companies did not own any Esport titles and financing providers and operators was inefficient and would result in leakage of user data from China to foreign countries.

The main opportunity in the paper was the government support which Esports received eliminating legal barriers to entry for companies that wanted to participate in the industry as well as creating regulating bodies that would deal with the development of the industry. The conclusion of the analysis was that the investment in Esports should be heavily motivated, more

[3] Scholz T. M. 2019, Esports is business. Retrieved from: https://www.palgrave.com/gp/book/9783030111984

events need to be organized, more promotion is necessary.[4] Another prediction in the same year was made in the paper from K, Jonasson where he compares Esports to a western trend, strongly argues against the comparison of Esports to traditional sports and creates his own diagram for 3 scenarios which the industry will take.

Figure 2- Prediction curve of Esports



https://www.researchgate.net/publication/248952070_Electronic_sport_and_its_impact_on_future_sport_Sport_in_Society_132_287-299

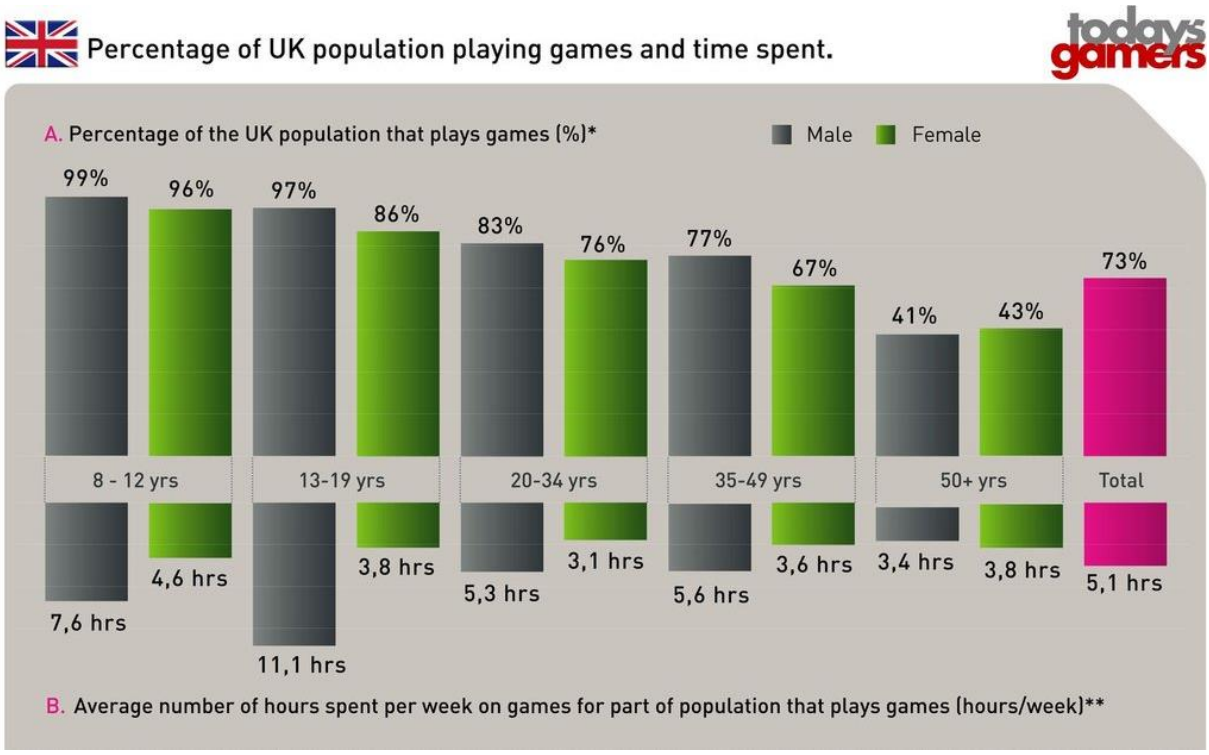
The scenarios mentioned above represent the final destinations of Esports through its development. The first scenario Counterculture assumes that Esports is a cultural trend where the only attention comes from it being a trendy topic which will eventually fade. The second scenario Accepted/Part of the modern sport refers to Esports being equal to traditional sports and the growth of the industry. Finally, the last scenario depicts Esports as the future of sports where it is widely accepted and represented everywhere.[5]

The United Kingdom government conducted a survey in 2009 consisting of 2000 participants from various age groups and professions where the main focus was on time spent playing video games and how many citizens actually participate in such activities. The survey originally wanted to focus on mobile games played on social networks but soon the focus shifted to video games in general due to the astounding popularity of the surveyed topic.

[4] Bo LU, Hui-qi FA 2010, Beijing ESports Industry Development Based on SWOT Analysis. Retrieved from: https://file.scirp.org/pdf/26-1.24.pdf

[5] Jonasson, Kalle & Thiborg, Jesper. (2010). Electronic sport and its impact on future sport. Sport in Society, 13(2), 287-299. Sport in Society. 13. 287-299. 10.1080/17430430903522996.

Figure 3- Time spent playing video games in the UK



https://www.gamespot.com/articles/uk-survey-reveals-massive-gaming-growth/1100-6230654

The figure above shows the massive time spent and participation of the UK population across all age groups most significantly the ages between 13 and 19 years old. At the time in 2009 there was a large discrepancy between female and male video game users when it came to hours played.[6]

2.3 Review of public statistical data

This chapter will use graphs and tables that were showcased in 2019 and 2020 research papers which show the growth of Esports as an industry, revenues gathered from Esports and its products, most prominent regions that participate in Esports and other relevant sets of data. Most recent research papers use the statistical data published in Forbes in the december of 2019 which shows the development of Esports as an industry and the rise of the Esports audience.

[6] Walton M, 2009- UK survey reveals massive gaming growth. Retrieved from: https://www.gamespot.com/articles/uk-survey-reveals-massive-gaming-growth/1100-6230654/

Figure 4- Esports revenue over the years

https://www.forbes.com/sites/jamesayles/2019/12/03/global-esports-revenue-reaches-more-than-1-billion-as-audience-figures-exceed-433-million/#180fc9611329

Figure 3 shows the growth of Esports revenue from the year 2013 to 2020 and a prediction for the year 2021. The Forbes article estimated that by the end of the year 2019 the Esports will be a billion dollar industry and the current information suggests that the industry has nearly doubled their expectations which is why many of Forbes' analysts call Esports the green industry due to its profits.[7]

Company Limelight carried out a survey in 2019 as a part of their research which included 4500 participants from around the world most notably from European regions such as: Germany, France and Italy and combined it with the surveys from India,Japan, South Korea, Indonesia and Singapore. The purpose behind the company's surveying the time spent playing video games was to build business intelligence with the findings they got. The ability to survey the majority of the world's regions anonymously resulted in very little human bias which is why this research has a very small standard error margin.

[7] Ayles J, 2019- Global Esports Revenue Reaches More Than $1 Billion As Audience Figures Exceed 433 Million.From:https://www.forbes.com/sites/jamesayles/2019/12/03/global-esports-revenue-reaches-more-than-1-billion-as-audience-figures-exceed-433-million/#180fc9611329

Figure 5- Time spent gaming across countries

Country	Less than 1 hour a week	1-2 hours a week	2-4 hours a week	4-7 hours a week	7-12 hours a week	12-20 hours a week	More than 20 hours a week	Average Hours Each Week
France	12.8%	21.4%	16.6%	16.6%	13.4%	10.0%	9.2%	**6.97**
Germany	15.2%	11.0%	17.2%	19.0%	13.6%	12.4%	11.6%	**7.98**
India	10.8%	14.6%	19.4%	15.8%	23.4%	11.4%	4.6%	**6.92**
Italy	13.0%	15.6%	19.4%	17.6%	17.8%	10.0%	6.6%	**6.79**
Japan	21.2%	17.8%	14.0%	18.0%	8.2%	9.8%	11.0%	**6.88**
Singapore	14.8%	17.4%	15.0%	16.6%	15.2%	10.6%	10.4%	**7.44**
South Korea	17.8%	17.0%	17.4%	17.2%	12.8%	8.8%	9.0%	**6.69**
U.K.	15.4%	19.2%	17.2%	16.6%	13.6%	9.2%	8.8%	**6.76**
U.S.	12.8%	19.8%	14.6%	18.6%	11.2%	11.4%	11.6%	**7.61**
Global	**14.9%**	**17.1%**	**16.8%**	**17.3%**	**14.4%**	**10.4%**	**9.2%**	7.11

https://www.limelight.com/resources/white-paper/state-of-online-gaming-2019/

In figure 5 we can see that Germany has the most hours spent playing video games followed by the US and Singapore. The researchers expected South Korean surveys to have the most hours played but their research showed Germany to have the highest amount of hours played.Globally the value averages out to 7.11 hours played per week which is a significant amount of time which companies are already taking into account by running gaming focused ad campaigns for their products to reach this massive audience. In comparison to the previous chapter, researchers that predicted Esports and digital trends to continue to grow were on point but not even large companies such as Forbes could predict the scope of the growth. The UK surveys from 2019 compared to 2019 show an increase in time spent playing from 4.9 hours on average to 6.76 hours per week. This shows the growth of the gaming industry in that area.[8] China is considered to be a world leader in online gaming by amassing a player base of over 600 million unique users in mobile,console and computer games. The investment into Esports and gaming is apparent due to Chinese conglomerates such as Tencent and NetEase are constantly purchasing gaming companies and broadcasting rights. [9]

[8] Limelight networks 2019- The state of online gaming in 2019. Retrieved from: https://www.limelight.com/resources/white-paper/state-of-online-gaming-2019/

[9] Lai L. T. 2020- Gaming in China stats and facts. Retrieved from :https://www.statista.com/topics/4642/gaming-in-china/

3. OVERVIEW OF DIGITAL ECONOMY

3.1 Definition of digital economy

Immensely quick technological developments and digital applications have caused, influenced and allowed an enormous increase in the global user population. The digital economy has no limitations as opposed to traditional business models.This flexibility enabled the Esports industry to be flexible, played anywhere, watched anywhere and business to promote products anywhere. Modern life has been drastically influenced and industries such as entertainment, health, education, business, gaming, provide an option where the citizens can engage with the government and society to create innovative ideas and propose political and social change. The most recent definitions of digital economy according to Deloitte the combination of several use technologies some of which have been used for other purposes implemented in the sphere of economic and social activities performed online via the use of Internet technologies. Technologies and platforms such as telecommunication cables and routers are the enabling devices that smartphones,tablets and personal computers connect to. This massive network is ideal for Internet of Things, big data analytics and cloud computing which are essential components of the digital economy infrastructure[10] . Another definition by Deloitte focuses on the hyper-connectivity of the users connected to digital networks which created the digital economy and the billions concurrently every day online connections which digital economy results from.This definition focuses on the devices and systems which allow this hyper-connectivity to be optimized and monetized with the emphasis being on the mobile technologies and the Internet of Things. Although certain organizations and individuals are using technology for simple problem solving on the computer, the digital economy is much more advanced than that. It cannot be defined as implementation of computers to solve tasks by using traditional or new methots. Instead, the digital economy showcases the opportunity and the requirement of individuals, groups and organizations to complete these tasks quicker,better and more precisely than before with the use of digital technologies. Computer networks, such as the internet, are the foundation of the digital economy.[11] Digital- enabling infrastructure is vital for the existence of Esports and digital products, without these components not a single digital business model would be possible and these include

[10] Deloitte 2017, Digital economy article. Retrieved from: https://www2.deloitte.com/mt/en/pages/technology/articles/mt-what-is-digital-economy.html

[11] Deloitte 2018, Digital enablement turning your transformation into a successful journey. Retrieved from:https://www2.deloitte.com/content/dam/Deloitte/ie/Documents/Technology/IE_C_HC_campaign.pdf

- Computer hardware- Physical components that the computers and other devices are composed of. These devices are monitors, hard drives, wireless communication devices and modems, semiconductors, sensors, audio and video equipment. Hardware is essential for Esports since it is impossible to access Esports without a device which is practically hardware.
- Software- The programs and other information tools that the devices use such as computer software and servers, database programs, development tools, image editors and communication platforms. Software is developed for a specific purpose and then it is run by hardware. Software is the development tool of every video game ever created and it is the intellectual property of the organization that created it. Esports and digital products are essentially sets of written code that is run by hardware and user input.
- Telecommunications- the equipment required for the transmission of data over a distance by using optic cable, satelites, antennas, receivers, signal transmitters and other devices. During the television era the transmission was analog which was a limiting factor for the broadcasting industry whereas today we have digital transmission which enables massive transmission of data. This massive transmission of data is the vital part of Esports since live broadcasting of digital content would be impossible on analog transmission.
- Structures- this pertains to the creation of digital products or services . The structure category also includes structures that provide support for services or digital products.
- World wide web (WWW)- an information system where documents,data and other information are recognized by the URLs (uniform resource locators) which can be interlinked with the HTTP (hypertext transfer protocol) that can be accessed through web browsers.
- Spread- the component of digital economy that refers to the widespread use of digital media, products and services, gadgets, devices and other participation methods. Participants in the digital economy are unable to communicate with non participants within the digital economy. [12]

Digital technologies can be divided into two categories. These categories are primary and secondary, more specifically basic and emerging technologies. Primary (basic) technologies refer to technologies that are already a component of the common digital business models such as the

[12] McKinsey Global Institute, (2013) Disruptive technologies: Advances that will transform life, business, and the global economy. Retrieved from: https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Disruptive%20technologies/MGI_Disruptive_technologies_Executive_summary_May2013.ashx

mobile technologies, cloud computing, sensor technologies, social networks and platforms, big data analytics and the internet of things. Contrary to the primary technologies, secondary technologies have great potential to be omnipresent in business where companies will need to either implement them or die. Most of them are still developing or partially used in certain business models but they still have room for improvement before massive implementation. These technologies include robotics, wearable technologies, most prominently artificial intelligence, facial and speech recognition, eye tracking, biometrics analysis, virtual reality and the controversial 5G connection .[13] Many companies are trying to include these rapidly developing technologies into their business models in order to get a competitive advantage. These technologies are already present in the Esports industry and improvements in those digital technologies will be a turning point for the industry.

3.2 Primary technologies used in today's business models

This chapter will focus on the digital technologies that have shaped the current state of business models into what it is today, a truly digital form of commerce where users make purchases around the world conveniently. Most impactful technologies will be covered in this chapter referring to cloud computing, big data analytics and most importantly mobile technologies.

3.2.1 Cloud computing

Cloud computing is currently a norm when it comes to data sorting, transmission and storage.Cloud computing can be defined as s a style of computing where scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies[14].

Another widely accepted definition of cloud computing defines it as a model which opens up the possibility for network access of a pool of shared computing resources at the user's convenience. For example servers, applications and services which can be issued and observed with a minimal amount of effort or interaction from the provider.[15] Cloud computing if utilized properly offers key advantages that current business, most notably mega corporations have successfully utilized. Those key advantages include rapid spread of data with a miniscule cost of relocating and sending data, the ability to access data from anywhere in the world with the right permission, the

[13] Spremić, M. (2018): Enterprise Information Systems in digital economy environment, Faculty of Economics and Business, Zagreb

[14] Gartner, Inc. 2010. Cloud Computing Key Initiative. Retrieved from:https://www.gartner.com/en/documents/2718918/cloud-computing-innovation-key-initiative-overview

[15] Mell P. , Grance T. 2011. The NIST definition of cloud computing. Retrieved from: https://csrc.nist.gov/publications/detail/sp/800-145/final

data can be accessed at the same time by many users simultaneously without hindering any users viewing experience, cloud computing is reliable when it comes to preservation of data due to many back ups and time reversing mechanisms in place and most importantly maintenance is performed by the cloud computing provider rather than the company meaning.[16] There are three leading cloud computing providing companies which are Amazon, Microsoft and Google. Currently, Amazon is a world leader when it comes to the cloud computing platforms with its AWS (amazon web services) which is currently providing cloud computing services to big name brands such as Netflix, Spotify, Sony, Siemens,Twitch and even some government agencies such as the National trust, UK Ministry of justice, NASA and NASDAQ. Amazon's cloud computing dominance is even more apparent when taking into account that even its competitors Disney and Hulu are paying for their services.[17] Esports is broadcasted through two channels either amazon web services on Twitch or google cloud services on Youtube. There is currently a trend leaning towards Twitch as the main platform for broadcasting Esports but both variants do not include China since both are prohibited in China. Youtube is investing heavily into becoming the official Esports League broadcasting platform and many companies are signing exclusive agreements to participate only on Youtube.[18]

3.2.2 Big data analytics

Big data is data which is classified as too big to process, store and transfer by using traditional methods. The amount of data generated every day from millions of data generating sources has increased the need to evolve the methods for handling data and since data is the new currency of the 21st century, the approaches to data are continuously evolving. According to NIST (national institute of Standards and Technology) big data is defined as the emergence of complex and enormous datasets which traditional data architectures were not able to process. For data to fit the analytically capable data set it first needs to have large volume which measures the size of the dataset, the data needs to have Variety which means exist in multiple storage units or domains and finally Velocity which refers to the rate at which the data can be processed. These characteristics are standardized as 3 Vs when discussing big data and performance of methods used to capture efficiency of handling big data. [19] Having defined big data, the purpose behind

[16] Voss A. 2010, Cloud computing is a journey. Retrieved from: https://www.itapa.sk/data/att/628.pdf
[17] Saunders B. 2020 Who uses Amazon web services.From: https://www.contino.io/insights/whos-using-aws
[18] Vynck G., 2020 Youtube gets streaming rights to major League events. Retrieved from https://www.bloomberg.com/news/articles/2020-01-24/youtube-gets-streaming-rights-to-major-e-sports-leagues
[19] NIST 2019, Big Data Interoperability Framework: Volume 1, Definitions. Retrieved from: https://www.nist.gov/publications/nist-big-data-interoperability-framework-volume-1-definitions

gathering and processing such large data sets is acquiring business intelligence through big data analytics. The problem occurs when such large data sets need to be analyzed by traditional statistical methods, the results are almost impossible to derive without implementation of newly developed data interpretation methods that contain some form of artificial intelligence or machine learning. These newly formed methods for analyzing big data are

- Cluster analysis- Cluster analysis is a statistical method for handling and processing data. It functions by organizing items into groups, or clusters, on the premise of how closely associated they are. Clustering large data sets produces clusters of data that is similar which can directly be used in business as it can reveal certain patterns.[20]
- Genetic algorithms- are search algorithms that have been randomized that were developed for the purpose of imitating the mechanics of natural selection and natural genetics.They operate on string structures similarly to biological creatures, information exchange is randomized but structured similarly to the principle of survival of the fittest and similarly to that theory the algorithms are evolving.[21]
- Natural language processing- is a method for analyzing and interpreting texts which naturally follow the human linguistic patterns by using technologies for computing millions of text samples in order to achieve human-like language processing.[22]
- Machine learning- encompasses a wide range of research activities in Informatics regarding learning systems. Moreover, the definition from King's college focuses on models and algorithms which enable systems and applications to learn. Most notable learning systems include biometric technologies, artificial intelligence, robotics and data analytics. Machine learning is enabling software to provide answers such as classifying clusters of data into sensible categories, predicting data values from gathered data and trends, detecting patterns among large datasets and most importantly giving the user suggestions based on processed data .[23]

The best template of usage of data analytics in a business model can be seen in the video streaming behemoth Netflix. The company is gathering data from hundreds of millions concurrent users and by doing so the company is successfully able to craft personalized recommendations to every subscriber of their service. Their big data analytics model finds

[20] AIP 2015, Volume 1644, Issue 1. Retrieved from: https://aip.scitation.org/doi/abs/10.1063/1.4907823
[21] Chen D. 2020, Genetic algorithm From: https://www.sciencedirect.com/topics/engineering/genetic-algorithm
[22]Liddy, E.D. 2001, Natural Language Processing. In Encyclopedia of Library and Information Science, 2nd Ed. NY. Marcel Decker, Inc.
[23] King's college in London 2019, Machine learning article. Retrieved from: https://www.kcl.ac.uk/research/ml

patterns among the watched content and with each minute spent watching a certain type of content on their streaming platform the machine learning component of their model learns more about the current user improving their suggestions and improving their overall experience based on the analysed data. Netflix also takes into account the device you are using for consumption of their services and in their marketing campaign they revealed they suggested the movie titled "Bird Box" to users who are viewing content on an Apple macbook. This demonstrates how Netflix can be an lucrative option for marketing companies to target users with their advertisements and products based on the data Netflix has on their users.[24]

3.2.3. Mobile technologies

In just a couple of years, portable devices that can connect to the internet using 3g or 4g have gone from a luxury good to standard good since more than 900 million people own mobile phones and tablets and similar gadgets. Being constantly connected to the world wide web with an increasing number of mobile applications users to proceed with their daily routines that have changed due to them having discovered the new sphere of experiencing and informing users about the world. The mobile platform consists of applications for both business and public sectors, creating a more efficient environment for executing services and creating opportunities to increase productivity for example the use of location-based services to implement both global positioning systems (GPS) and targeted retail promotions. New transaction methods consisting of m tokens and m-banking applications or ther mobile transaction methods are creating a new sphere of purchasing that can be conducted everywhere and anytime. This in itself is the biggest business opportunity of our century since consumers can now effortlessly purchase anything they demand by simply using their mobile phones at their convenience as far as calling smartphones the new "credit cards".[25]

The primary technology that is closely connected to mobile technology is social media. The two are closely related since almost every mobile phone user has some form of social media or other communication media installed on their mobile device. According to research conducted by J. Clement in the july of 2020 the total amount of unique mobile device users connected to the web is estimated at 4.17 billion users out of 4.57 billion internet users.In other words 91% of the entire unique internet user base accesses the internet through their phone.Moreover, this accounts

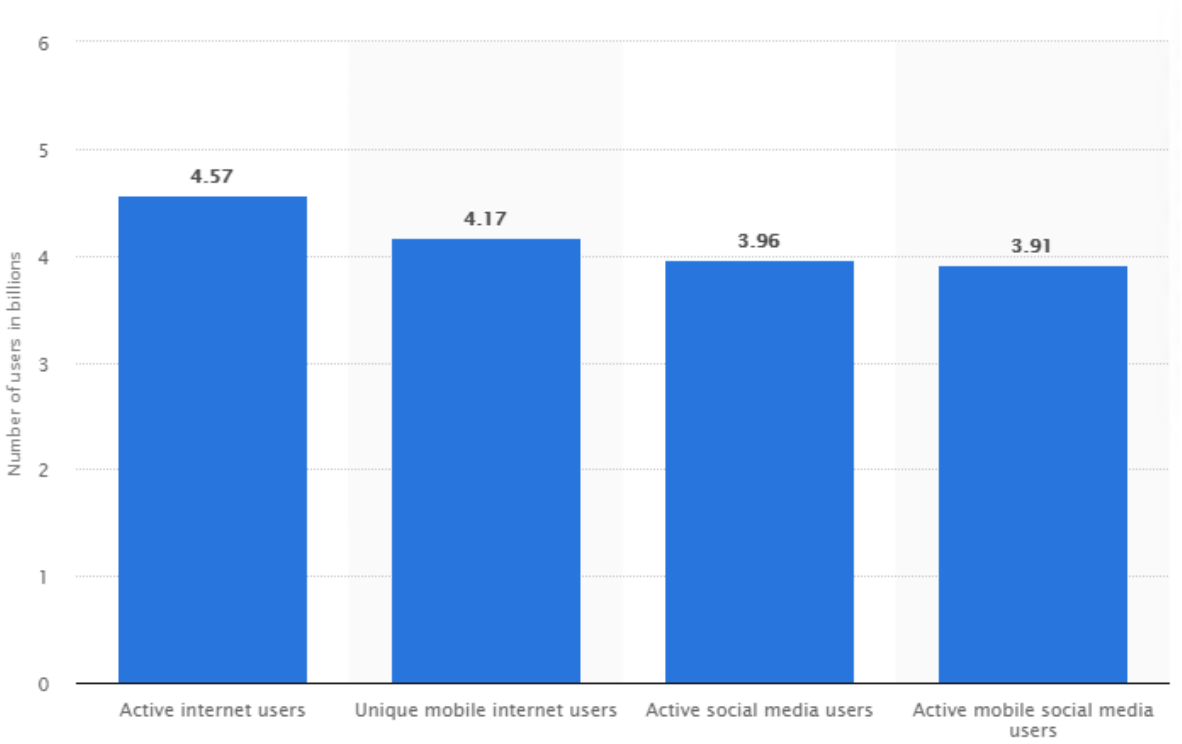
[24] Markman J. 2019, Netflix Harnesses Big Data To Profit From Your Tastes From: https://www.forbes.com/sites/jonmarkman/2019/02/25/netflix-harnesses-big-data-to-profit-from-your-tastes/#3c07c26366fd

[25] Keng-Boon O. , Garry W. T. 2016, Experts Systems With Applications, Volume 59. From: https//doi.org/10.1016/j.eswa.2016.04.015.

for more than half of the world's population having a device connected to the internet and what is also noticeable is that the vast majority of those devices have some form of social media installed on them[26]

[26] Clement J. 2020, Global digital population as of July 2020 retrieved from: https://www.statista.com/statistics/617136/digital-population-worldwide/

Figure 6- Active internet and mobile users



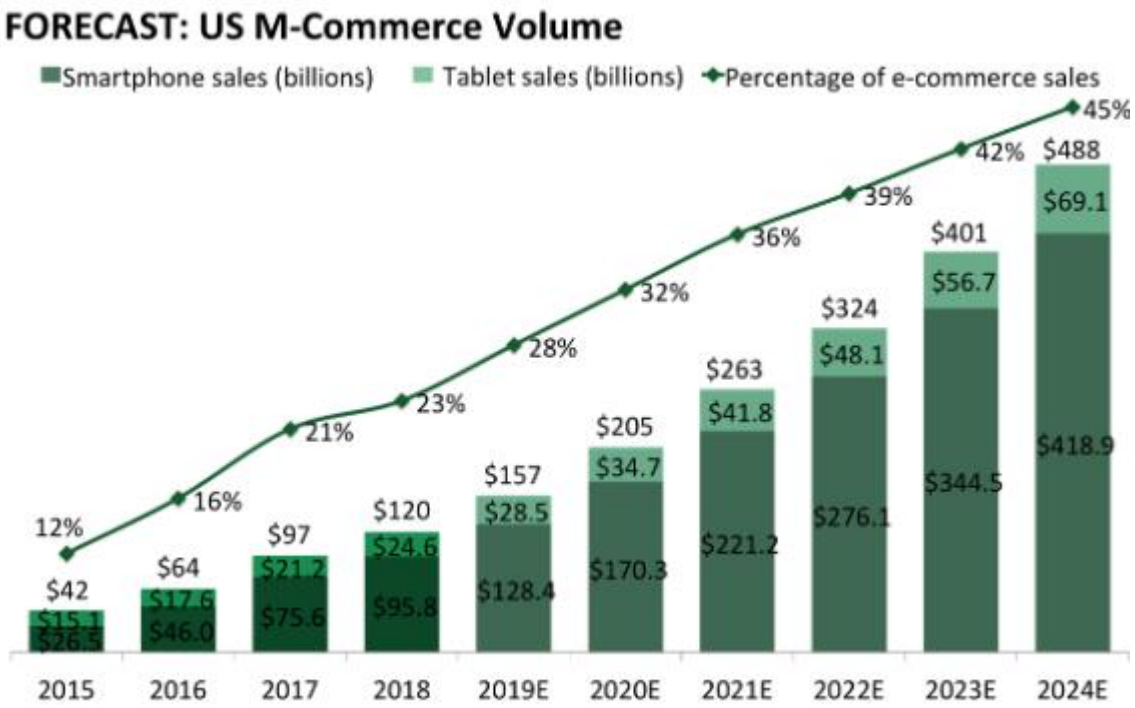
https://www.statista.com/statistics/617136/digital-population-worldwide/

Figure 6 shows the estimated number of active unique internet users measured in billions in comparison to the proportional usage of web services through mobile phones and social media users. It is vital to note the amount of active mobile social media users. The number of those users accounts for 85% of the total number of active internet users. This is the business intelligence that shaped today's way of conducting business and communication with the consumers.

With the size of the mobile user base and communication through social media, mobile phones have become that standard for e-commerce and social media the main form of advertising for the e-commerce products. According to the research conducted in the United States by the Business insider they predict that mobile phones will become nearly prevalent in the way e-commerce is conducted by stating that in 2024 nearly 50% of all online e-commerce transactions will be conducted through a mobile device.[27]

[27] Meola A. 2020,The rise of M-commerce. Retrieved from: https://www.businessinsider.com/mobile-commerce-shopping-trends-stats

Figure 7- Mobile commerce in the US



https://www.businessinsider.com/mobile-commerce-shopping-trends-stats

Figure 7. illustrates the growth of mobile e-commerce in the United States by showing how the percentage of conducted sales through smartphones has increased over a period of 5 years and also shows the prediction that the Business insider made regarding 2024 where the value is at 45% of total e-commerce sales.

Global web index report estimates that 28% of the customers are making purchases due to advertisements they saw on social media while around 24% of the customers made a purchase inspired by comments and recommendations they saw on social media platforms. This research confirms the correlation between mobile e-commerce and social media by demonstrating that the business intelligence regarding mobile users and social media users acquired in the previous years has converted into common practices. Most notably, the vast majority of purchases were redirected from Facebook and Instagram[28]

[28] Global Index Media 2019, Social media trends report. Retrieved from:https://www.globalwebindex.com/reports/social-2019

3.3 Secondary technologies in developing business models

This chapter covers emerging technologies in their development phase, answers questions such as how are they defined, how are the emerging technologies improving and finally how some companies are utilizing the already developed components of emerging technologies. The chapter will cover currently highly sought after technologies such as Artificial intelligence (AI), Augmented and virtual reality (AR and VR) and finally Advanced robotics.

3.3.1 Artificial intelligence

Artificial intelligence is a very popular topic among every fortune 500 company and every government in the world. It is believed to be a breakthrough in every aspect of life especially the business sector and this is why most big name companies have a research department dedicated solely to artificial intelligence and its applications.John McCarthy who is claimed to be the founding father of the discipline created his definition of artificial intelligence in 1956 which states that of making a machine behave in ways that would be called intelligent if a human were so behaving.[29] A more modern version of the definition states AI is the ability of the system to learn from data by executing precise sequences of data interpretation and gaining knowledge from that data and utilizing the learned competencies to deliver goals and complete tasks correctly .[30]

In order for artificial intelligence to be fully developed and functional it needs to pass the Turing test which is the ability of a machine to demonstrate intelligent behaviour to that of a human. It ranges from emotional intelligence to actual human intellect and deductional capabilities. The test is conducted by using Artificial intelligence to trick three judges into believing that they are communicating with actual humans rather than some form of artificial intelligence. The original Turing test was solved by a Russian chatbot Called Eugene with a 33% pass rate which was incredible at the time. The new version of the Turing test now requires a 3 hour conversation between the artificially intelligent unit and judges in order to be passed. Current predictions by the experts in the field state that it won't be done by 2029.[31]

[29] McCarthy J. 1956- Publication of artificial intelligence

[30] Kaplan A. , Haenlein M. 2019, Volume 62, Issue 1, Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. Retrieved from: https://www.sciencedirect.com/science/article/pii/S0007681318301393

[31] Hern A. 2016, What is the Turing test. Retrieved from: https://www.theguardian.com/technology/2014/jun/09/what-is-the-alan-turing-test

Figure 8- Characteristic of AI

	Expert Systems	Analytical AI	Human-Inspired AI	Humanized AI	Human Beings
Cognitive Intelligence	×	✓	✓	✓	✓
Emotional Intelligence	×	×	✓	✓	✓
Social Intelligence	×	×	×	✓	✓
Artistic Creativity	×	×	×	×	✓
		Supervised Learning, Unsupervised Learning, Reinforcement Learning			

https://www.sciencedirect.com/science/article/pii/S0007681318301393

Figure 8 shows the guideline criteria for fulfilling the Turing test by perfectly imitating human beings. This application of human intelligence in today's understanding of artificial intelligence is merely a stepping stone since business would want artificial intelligence to be actually more efficient than human workers. Currently, virtual assistants are the most widespread form of applied artificial intelligence in today's business models. Siri and Alexa are currently gathering massive amounts of user data coupled with machine learning and Icloud and Amazon web services cloud computing of that information. In his research paper Andreas Kaplan believes this is the beginning phase of artificial intelligence development where Siri recognizes your voice and understands basic commands. The next step he describes is when virtual assistants can perform tasks such as driving a car or coffee preparation on a coffee machine. And the final stage of artificial intelligence where Siri develops capabilities that are above human which can be used for solving mathematical problems of great complexity instantly and writing literacy masterpieces effortlessly. Artificial intelligence of that level would be a staple for every business, government and individual purpose and would change the world as we know it. [32]

3.3.2 Virtual and Augmented realities

Augmented reality (AR) displays binary sequences as digital experiences and an interpretation of the physical world while virtual reality (VR) creates a new digital environment that the users can interact in. AR and VR can evolve the way a story is told and the users experience content, but the business incentive to achieve this concept might not be in the best interest of users due to the fact that it could jeopardize their health . Augmented reality, virtual reality and other immersive technologies are capable of significantly changing the experience of content consumption. They

[32] Kaplan A. , Haenlein M. 2019, Volume 62, Issue 1, Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. Retrieved from: https://www.sciencedirect.com/science/article/pii/S0007681318301393

have the ability to create unexperienced realistic feelings,skills and understanding, which could make content more immersive and more powerful than when displayed by using traditional methods of content consumption. With the cost of this technology diminishing, creators will be able to drastically improve the way stories are told and content of narrative qualities in a medium of the new age. In today's day and age, customers are spending a gradually rising amount of time by operating screen based devices and gadgets. This technology has unrealised the potential to be more interactive and capture more insightful user specific data from users. There is a great risk that businesses will exploit the capabilities of immersive technologies and ruin the well-being of individuals for profit. AR is capable of radically changing the experience of customers (most notably in retail) and even impact the way employees conduct work tasks. While VR might not impact the work environment it certainly will disruptively impact the consumer content. VR will have a more limited impact, but can play a disruptive role in consumer applications.[33] The applications of VR and AR technologies are endless but currently the projects based on those technologies which are heavily invested in are:

- Healthcare- Simulating a virtual reality where surgeries can be performed, practiced and executed to perfection would improve the quality of surgeries performed around the world as well as provide new insights about the human body. VR and AR also offer solutions to diagnostics, where patients can describe their symptoms in a more accurate manner as well as the stimulated version of the patient can be examined more easily than the actual patient as well as mental health treatment.[34]
- Retail and e-commerce- This implementation of VR and AR technologies would revolutionize the current state of e-commerce and would create new platforms for customers to access the products that businesses offer. Users will be able to visit digital stores instead of web shops which would be simulated as actual stores that could be accessed from anywhere. This implementation would offer users the experience of analysing products they are purchasing, measure dimensions,colors, try out clothing, change the environment of those objects for example the user could be offered an option to see a white couch from the store in his own living room before purchase to check compatibility. All of these conveniences would completely transform retail and commerce

[33] Google 2019, Augmented Virtual reality. Retrieved from: https://arvr.google.com/ar/

[34] Pillai, A. S., & Mathew, P. S. (2019). Impact of Virtual Reality in Healthcare: A Review. In Guazzaroni, G. (Ed.), *Virtual and Augmented Reality in Mental Health Treatment* (pp. 17-31). IGI Global. http://doi:10.4018/978-1-5225-7168-1.ch002

and this is the reason why so many big name companies are investing into VR and AR projects to implement into their business models.[35]

- Entertainment- VR and AR could forever change the way we consume entertainment by changing the experience from an observational standpoint to an immersive standpoint where the users are actually a part of the experience instead of spectators. Current content consumption platforms offer very limited consumer interaction rather they are set up where consumers consume sequences of content with very little input aside from the type of entertainment conted they want to consume[36]

Current business applications in the retail industry are coming from Ebay where they allow their users to observe their products in a new way using virtual reality technologies. In 2016 Ebay has opened a virtual department store that can be accessed through the Ebay's patented VR goggles the customers gets to select his areas of interest and the store around him would transform to fit his needs providing a variety of 12500 virtual products that could be purchased and shipped to the user as normal products.[37]

3.3.3 Advanced Robotics

Even 200 hundred years after the industrial revolution, industrial robots have been replacing humans in the completion of physical and dangerous jobs or jobs that humans do not prefer such as spray painting or digging.. These robots have been costly, of big size, and immobile because they are nailed to the floor and covered in fences to keep the workers safe. Today, robots have become drastically more advanced (intelligent, agile and flexible) are developed with improved motoric senses,agility and intelligent interface as a result of drastic improvement of machine learning, AI, machine-to-machine information exchange , sensors, and adapters. These robots can be simpler for workers to code and work with. They are capable of being more compatible, better at adapting and more practical, making it a possibility to utilize them properly and safely next to workers. These advances could make it effective to the point where it's possible to substitute human labour for robots when completing more demanding production taks, as well as in certain service jobs where cleaning and maintenance is necessary. Advanced robotics offer capabilities

[35] Chirico A. , Lucidi F. , De Laurentiis M. , Milanese C. , Napoli A. , Giordano A. 2016, Virtual Reality in Health Systems: Beyond Entertainment. A Mini- Review on the Efficacy of VR During Cancer Treatment J. Cell. Physiol. 231:275-287. doi:10.1002/jcp.25117

[36] Schnak A. , Wright J. M. 2019, Volume 117, Immersive virtual reality technology in three-dimensional virtual simulated store. Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/S0747563219300603

[37] Ebay 2016, World's first Virtual Reality department store. Retrieved from: https://www.ebayinc.com/stories/press-room/au/worlds-first-virtual-reality-department-store/

that would be especially beneficial to surgeries by providing precise robot assistance, prosthetics for patients and entire robotic systems to help patients with limited mobility and improve the patient's quality of life.[38]

Boston consulting group (BCG) conducted a study in 2019 by interviewing industry leaders and experts about the use of advanced robotics. The study was focused on presenting the current implementation of advanced robotics in certain industries coupled with the potential advanced robotics could offer to the industry. The most drastic industry advanced robotics could improve is considered to be health. Experts believe that not enough resources went into the improvement of the health industry by using advanced robotics. According to BCG the industry that has utilized advanced robotics to its current potential is transportation and logistics. The research shows that transportation and logistics is 40% more efficient than it was in the last 5 years. This also refers to the consumer goods industry drastically improving due to logistics and transportation since transportation routes and warehousing systems have never been more efficient. BCG also mentioned that the automotive industry is the industry we need to keep an eye on when it comes to advanced robotics.[39] Dominos is known for its implementation of drones to complete pizza delivery tasks. In 2016 the company announced that they utilize a self-driving vehicle called Domino's robotic unit (DRU) which would complete delivery tasks and other logistics tasks the company needs performed. The idea was to combine the GPS and driving data gathered from drivers working over the course of a few years with machine learning to produce a DRU. The company was met with many regulatory issues similar to Google's self-driving car and their attempt of attempting advanced robotics has been put on halt until november of 2019 when they transformed the DRU prototype from a vehicle to a drone. It completed its very first delivery in New Zealand successfully without any human input. The DRU drone picked up the package and delivered it to the designated address. This shows that not only technological obstacles exist regarding advanced robotics but also legal,ethical and moral regulation need to be taken into account.[40]

[38] McKinsey 2013, Disruptive technologies advances that will transform life, business and the global economy. https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Disruptive%20technologies/MGI_Disruptive_technologies_Executive_summary_May2013.pdf

[39] Küper D. , Lorenz M. , Knizek C. 2019, BCG publication Advanced robotics in the factory of the future. Retrieved from: https://www.bcg.com/publications/2019/advanced-robotics-factory-future

[40] Underwood C. , 2020 Robotics in retail- Examples of real industry applications. Retrieved from: https://emerj.com/ai-sector-overviews/robots-in-retail-examples/

4. DIGITAL PRODUCTS

This chapter will cover one of the consequences of digitization and digital business models which are digital products and services. These products are intangible meaning their value is created in the digital realm and has no physical form. In other words users are purchasing virtual products and services that can only be accessed through digital platforms. With most of the human population having access to networks, wifi, mobile or other types of internet access and with the users using those networks on a daily basis it comes to no surprise that additional purchases in those available platforms would occur. The first part of the chapter will cover the definition of digital products coupled with a brief historical overview of the development of digital products and the transformation of media from physical to digital, these products have unique ways of being sold depending on the digital business model of the company this is why multiple revenue models exist which will be covered in the second part of the chapter. Finally, the chapter will be concluded with the successful implementation of digital products.

4.1 Definition and types of digital products

Digital products or digital goods are the result of a new form of conducting business through the use of digital technologies and as such they are a heavily researched topic defined in multiple ways. The Medium defines digital product as a software enabled product or service that offers some form of utility to a human being. A Digital Product has a mutually beneficial relationship with its customers.[41] This is a modern definition of digital goods that takes into account their reliability since non-physical goods are still the intellectual property of the producer even after being distributed to the users for example an Apple account can be terminated despite it having purchased digital products linked to the account. This made the giant companies dealing with such products to have very strict terms of service to get the user agreements to their platforms. Another definition provided by Danny Quah in 2002 states Digital goods are bit strings, sequences of 0s and 1s, that have economic value.[42]

Digital products have certain distinct characteristics that separate them from regular goods (physical products) that are a part of standard e commerce, these distinct characteristics include:

[41] Boyett R. 2019, What is digital production in 2019? Retrieved from: https://medium.com/ideas-by-idean/what-is-digital-product-in-2019-62240175bd33

[42] Quah, D. 2003. Digital Goods and the New Economy. Retrieved from: https://www.researchgate.net/publication/4808107_Digital_Goods_and_the_New_Economy

- **Nonrival-** a characteristic of digital products which makes them consumable by multiple users at once without diminishing the experience and value of other users consuming that product at the same time. For example, a movie in digital form can be watched by millions of users at once without interrupting the enjoyment of one another.
- **Infinitely expandable-** a characteristic of digital products that refers to the replication capabilities of digital products. Companies that own a digital product can produce infinite copies of that product and sell it to different users. For example, an application can have millions of downloads without going out of stock.
- **Non-perishable**- a characteristic of digital products that means that they do not deteriorate over time. Their perishability depends on the methods they are stored in, in ideal conditions the digital product will never perish as the digital form of that product is capable of being transferred onto any data storing device.
- **Discrete-** a characteristic of digital products which pertains to the ability to purchase a complete number of products instead of portioned amounts. For example, only an entire song can be purchased online, purchasing one and a half songs is impossible.[43]

Having defined the digital product's characteristics, there are many forms of digital products as well as formats in which digital products are stored, transferred, used and reproduced. These digital product types are currently staples in the current e-commerce market, where there are many providers for these products and services due to the demand being overwhelming. The demand for all digital products is not the same and this is why businesses separated digital products into groups that are divided into 4 classifications which are individually measured and have different profits and business models from one another. Digital products are classified as following[44]:

- **Digitized (Converted) products**- this classification refers to standard products that were transformed into their digital (binary) format such as video, music, magazines, e-books, e-documents, reports and many other transformed goods. These goods were at first stored on portable storage devices such as cds, usb portable drives, hard drives and other storing devices but due to the perishability characteristic these goods, despite being in binary form were not classified as digital until they became fully digital since the aforementioned components do deteriorate over time by having life cycles due to their storing devices.

[43] Quah, D. 2003. Digital Goods and the New Economy. Retrieved from: https://www.researchgate.net/publication/4808107_Digital_Goods_and_the_New_Economy
[44] Hui K. , Chau, P. 2002. Classifying Digital Products. Commun. ACM. 45. 73-79. 10.1145/508448.508451.

Fully digital formats of these goods are omnipresent in today's markets and industry leaders are gathering massive profits. Examples of such converted goods include Amazons's E-books, Itunes' music library, Amazon prime videos, Business insider online articles, Times, NY times online magazines for purchase and many more.

- **Tools and Utilities-** this classification refers to digital products that assist users in accomplishing certain tasks, enabling users to perform specific functions. Generally, referring to software that is for specific purposes and is available for purchase online through digital platforms. Types of this classification are commercial software, shareware and freeware. Most notable examples of this digital product classification include coding programs such as Python, GitHub, Microsoft Azure, professional software for image editing such as Adobe photoshop, Adobe Skyroom, Luminar and others, antivirus and security software such as BitDefender, Norton antivirus, ESET nod32 and many more.
- **Content Based digital products**-. The most prominent examples are the internet based media outlets such as the online newspapers, online articles, project reports. Most prominent example of this is the wall street journal, cnbc portal and bbc news outlet. Digital technologies have made it possible for content such as the news and journals to be interactive and allow users to choose articles and ignore as they see fit. Croatian examples of such information portals are 24 Sata, Index.hr, Večernji list. These portals offer information in a digital format as their product in exchange for the traffic that the users will generate on their portals.[45]
- **Professional/ Expert online services-** this classification refers to the digital services available across the web which offer value to customers in exchange for payment. Such services include streaming services, content production services such as graphic design, programming, translation, fitness programs and coaches, lessons and many more. The best example of the streaming services is undoubtedly Netflix as it offers a subscription based digital product to millions of users on a daily basis which is a fully digital business model that provides streaming of digital content to its users. The best example for professional online services are content producers for popular influencers. These content producers charge heavy fees for their knowledge on social media and knowledge on other platforms and provide them with content for their social platforms. They create videos with the

[45] Hui, K. , Chau, P. 2002. Classifying Digital Products. Commun. ACM. 45. 73-79. 10.1145/508448.508451.

footage received, statements, pictures and ideas without ever meeting the person in real life.[46]

4.2 Monetization models for digital products

With the massive audiences accessing the web on a daily basis, businesses were on a mission to capture those markets with their products and monetize them with familiar monetization practices but also due to the specific circumstances of the digital economy have created new monetization models for digital products. This chapter will cover models such as Freemium, Premium, Free (data model), Subscription model, Advertisements model and Product licensing model. [47]

Premium model- One of the simplest monetization models, potential users need to pay the full price for a digital product in order to get complete access to the product's features. There are no additional fees charged for that product afterwards. This monetization is particularly used for digital products that have a perceived value higher than their competitors. In other words, users believe that the product is superior to the alternatives. The premium model is also applied to digital products which are easily replicable such as movies. Movies can be pirated illegally if they were offered at free trials or for access prices. There is much less incentive to purchase an entire digital product in order to replicate it, alternative solutions are much more lucrative for those engaging in activities against the terms of service of the digital product provider. The examples for digital products monetized in this manner include software such as Windows operating system, Office package, purchasable movies, music, e-books, video games with no additional purchases and others.

Freemium model- This model of monetization is a combination of words free and premium which represents a mutually beneficial relationship between the business selling the digital product and the consumer. Users can acquire the digital product free of charge with basic functionalities but if they want to access the full functionalities of the product the users need to purchase the full version (premium version) of the product. These products typically tease the free user by demonstrating capabilities that their product offers in the full version in order to encourage the purchase of the complete version of the product. This model is enormously popular

[46] Leimeister J. M. , Alter S., 2014. Digital Services for consumers. Retrieved from: https://link.springer.com/article/10.1007/s12525-014-0174-6

[47] Skilton M. 2016, Building a digital enterprise. Retrieved from:https://books.google.hr/books?hl=hr&lr=&id=mtRgCgAAQBAJ&oi=fnd&pg=PP1&dq=monetization+of+digital+products&ots=rCUl_RtOG-&sig=dXtaYpqDF_bCCGJqh4TQxYC3DaM&redir_esc=y#v=onepage&q=monetization%20of%20digital%20products&f=false

in the mobile applications market due to the massive amount of mobile users which converts into downloads of the free version. This is the standard practice of large numbers where even a conversion rate of 1% from a free user to a premium user yields enormous profits due to the massive user base. This model is useful for companies that are new on the market and that have no reputation selling digital products. Since digital products cannot be examined like physical products, this model allows users to build trust, learn about the company and the product and finally make a purchase decision. [48]

Free (data) model- According to Metcalfe's law hypothesizes the number of connected users increases the cost of the network with an increase equal to squared sum of the number of users. This particular law has been used to explain why technologies such as mobile phones, social networks and web applications have grown over the last decade and declared that the number of users affect the value of a network due to increasing connectivity of the users which results in users joining the network to be connected with other users.[49] In the business era where big data analytics are priorities for the business intelligence of companies, data is worth more than ever before.

This model of monetization prioritizes the gathering of user data from digital products and handling the user data as a means of making profit. These digital products are usually completely free, requiring user registration with personal information, gathering information while the product is being used and are focusing on getting as many active users as possible. The reasoning behind focusing on active users is that the data collected daily is more precise which is more valuable for processing or potentially selling to businesses. Companies are willing to pay enormous amounts of money for the right type of gathered data. The data worth the most is from users from high income countries in the right age groups. This is why Netflix is currently running a free limited model in the US that requires registration and surveying to use. The model exists only in the US since their user data is more valuable than that of other countries.[50]

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[48] Skilton M. 2016, Building a digital enterprise. Retrieved from:https://books.google.hr/books?hl=hr&lr=&id=mtRgCgAAQBAJ&oi=fnd&pg=PP1&dq=monetization+of+digital+products&ots=rCUl_RtOG-&sig=dXtaYpqDF_bCCGJqh4TQxYC3DaM&redir_esc=y#v=onepage&q=monetization%20of%20digital%20products&f=false

[49] Hendler J. ,Goldbeck J. 2008, Volume 6, Issue 1, Web 2.0. Retrieved from: https://doi.org/10.1016/j.websem.2007.11.008

[50] Li Z. , Liu M. , Wang J. , Z. Cao 2013, Exploiting Ubiquitous Data Collection for Mobile Users in Wireless Sensor Networks. doi: 10.1109/TPDS.2012.92

Subscription model- Considered the gold standard among digital products. This monetization model is often coupled with a free trial where users get access to full features for a limited time but then need to pay a fee to continue to have access. Subscriptions can be non renewable and automatically renewable depending on the user preference but usually the company that offers subscriptions prefers the automatic subscription route and offers it at a cheaper price. This model is particularly useful for digital products and services which are difficult to copy, pirate, have a high barrier of entry into the market and are high in demand. This model enables users to decide during which period they would like to consume the digital product. Digital services such as Amazon prime, Netflix subscription, Disney + subscription, Hulu, Spotify and similar providers are dominating their industry by using this subscription monetization model. These companies are extremely difficult to compete due to the financial barriers of hosting such services, handling immense user traffic and finally purchasing licences to stream and produce the content users pay for.[51]

Product licensing model- This model of monetization of digital products is conducted through selling annual, semi-annual or defined licenses of the digital product. The user with the valid purchased licence can fully utilize and use the product without any repercussions or limitations. The company selling the licenses is responsible for maintenance, assistance and updating the product to the standards agreed upon purchase of licence. This model is specially useful when it comes to high end software or necessary software that certain users require for either personal or business use. For example, most anti-virus companies sell a licensed product since the virus databases need to be monitored and identification of new threats needs to be added into the software. Similarly, software used by companies such as structured query language (SQL), accounting softwares, procurement software and other types of software are licensed instead of sold at a one time fee due to the state of those businesses always changing, new laws and regulation require the software to be updated and improved.[52]

Advertisements model- Most popular monetization model amongst digital products according to the number of products it is applied to. This model combines third-party advertisements with the digital product as a form of revenue generating system. Users while consuming the digital product are periodically shown advertisements which are running for a period of time, sometimes with a skip option and advertisements which are a part of the interface of the product. This is a

[51] Wayne ML. Netflix, Amazon, and branded television content in subscription video on-demand portals. Media, Culture & Society. 2018;40(5):725-741. doi:10.1177/0163443717736118

[52] Powell B. 2017, Understanding the licensing business model. Retrieved from: https://www.b2bnn.com/2017/06/understanding-licensing-business-model/

very common practice in the digital industry as even the digital giant Google opted for this monetization model for some of its products. Google adsense is a service of smart ads that the company offers but also uses for their own products. These advertisements learn about the users preferences and suggest advertisements that the user might find interesting. Currently, Youtube, one of Google's biggest digital platforms, is monetized in this way.[53]

4.3. Successful implementations in the gaming industry

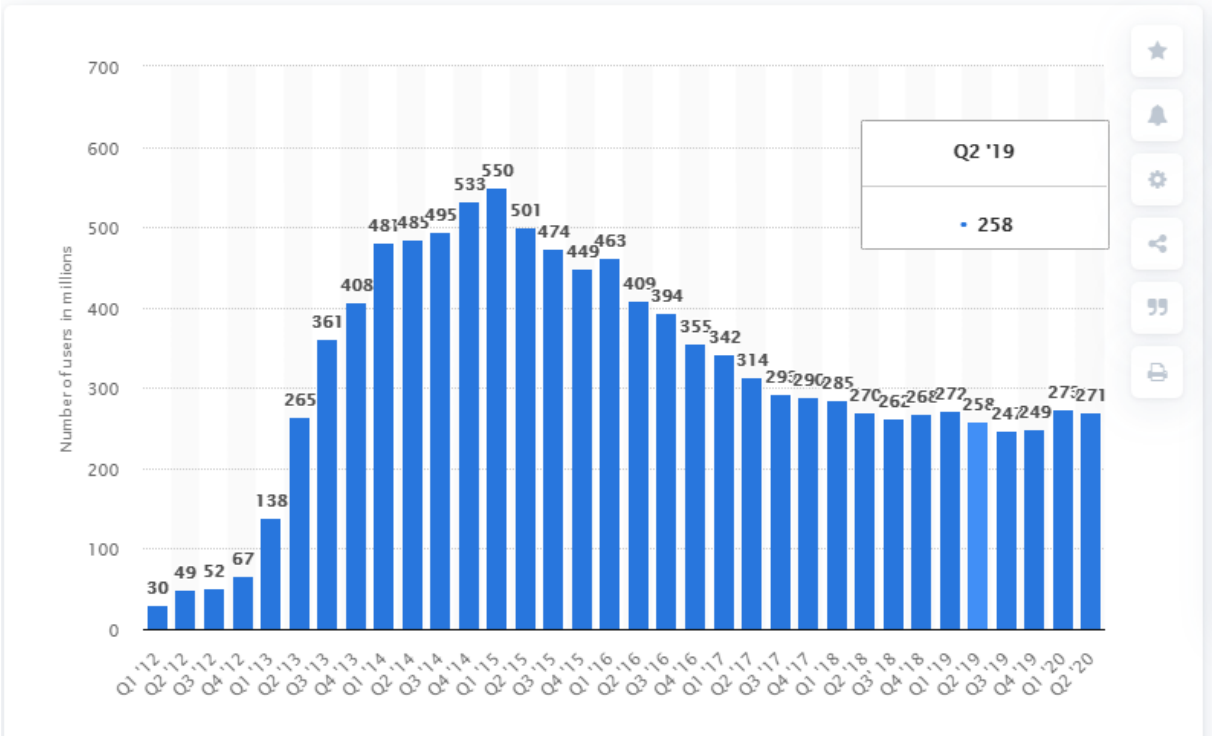
This chapter will cover digital products in the form of video games that offer in game purchases that have achieved worldwide success and popularity in the last decade. The success measurement of the digital product will be measured in the revenue and user base the product achieved. Digital technologies used, digital product classifications and monetization models will be analyzed. The games selected in this chapter have grabbed the attention of millions of users and successfully monetized the player base for years. The games selected for this chapter are played on three different platforms with three different monetization models and those are Candy crush saga, the most successful freemium game, Call of duty, a massive online multiplayer first person shooter and finally League of legends, a game that made Esports a global phenomenon.

4.3.1 Candy crush saga

Candy crush is a connect three puzzle video game created by King inc. which was released in 2012 on Facebook. Due to the massive popularity the video game achieved on Facebook it was transported into other existing platforms such as the browser version of the game, IOS version and android version. Their shift to the mobile version resulted in one of the largest streams of revenue created by a mobile application at that time, a true gold mine.

[53] Soegoto E. S. , Semesta R. B. 2018, Use of Google Adsense for income generating activity. Retrieved from: https://iopscience.iop.org/article/10.1088/1757-899X/407/1/012065/meta

Figure 9- Monthly users playing candy crush



https://www.statista.com/statistics/281595/king-digital-entertainment-quarterly-mau/

Figure 9 shows the rise in popularity of the Candy crush saga games displayed graphically in millions of users as measure. The player base is falling from its peak in 2014, despite that Candy crush saga is in the top 10 most popular mobile applications of all time. King inc. reports 271 million monthly active users in the quarterly report of 2020 playing Candy crush saga. According to the report Candy crush saga reached 1.5 billion dollars of revenue in 2018 with daily revenues being estimated at 4 million dollars.[54]

Candy crush utilized mobile technologies to the full extent by making the game playable anywhere and with the short durations per puzzle solved, it made it convenient for users to play in public transportation, while waiting queues, generally when users are bored and have a few minutes to spare. It is classified as a digital product of the converted category since the game had physical forms before a digital one. The expansion to the mobile market and implementation of mobile technologies was not the only revolutionary step the company made. The company implemented a freemium model of monetization. Many similar games with similar popularity did not make half the revenue due to the inferior monetization. The game itself has very little playability unless users make transactions that give them additional chances to make progress and

[54] Gough C. 2020, King Quarterly report (MAU) 20120-2020. Retrieved from: https://www.statista.com/statistics/281595/king-digital-entertainment-quarterly-mau/

reach higher stages. The game is seemingly free, offering a very limited playtime without additional spending when in reality the company reports a conversion rate of 30%. This means that 30% of their users have at the very least spent a cent playing the Candy crush saga games. The company was acquired by Activision in 2016 for an estimated 6 billion dollars, the same company that owns the next title in this chapter.[55]

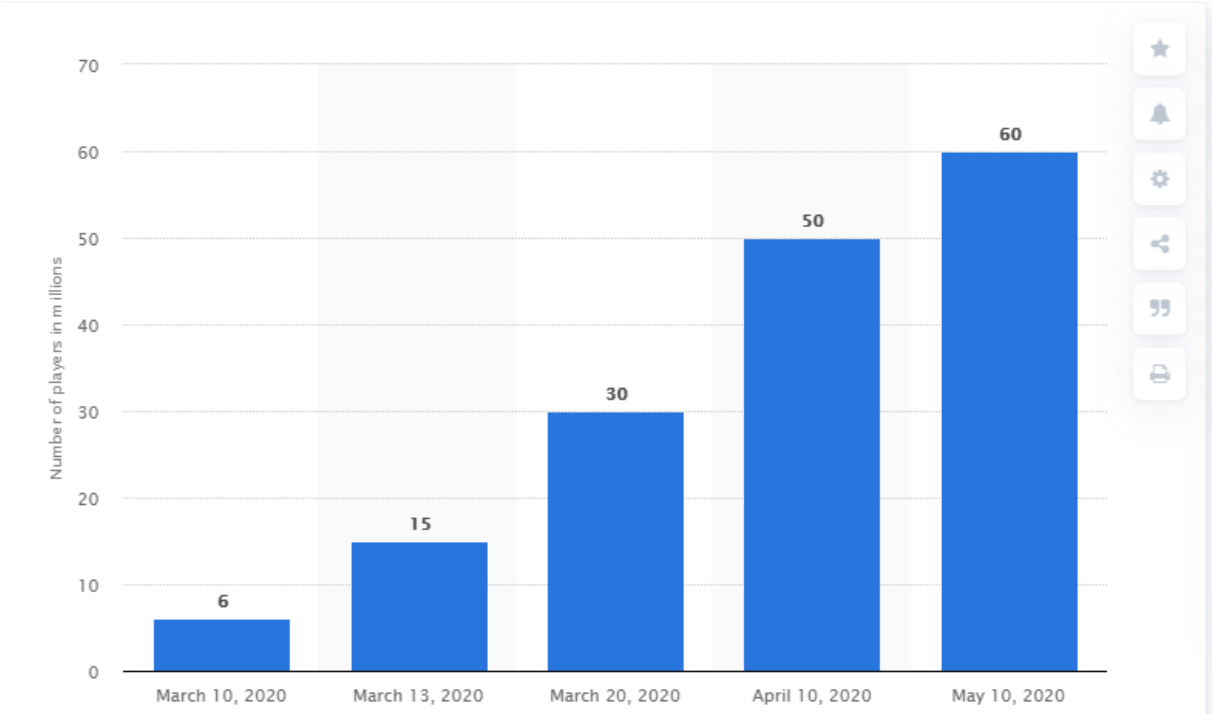
4.3.2 Call of duty Warzone

Call of duty is a first person shooter multiplayer video game owned by Activision-Blizzard. The franchise started out in 2003 with their first PC release becoming popular and currently hold over 20 Call of duty video game titles. In october of 2019, Activision released Call of duty Warzone as a sequel to the franchise and it was released on three platforms PC, Xbox and Playstation versions. Most dominant were the Playstation and Xbox version, cumulatively the game amassed 956 million dollar of revenue from micro transactions alone in the first quarter of 2020 according to Forbes. The numbers are attributed to the Covid-19 pandemic and the stay at home policies applied worldive but one factor is overlooked. Activision changed the monetization model from premium, one time purchase model to a micro transaction model where the game is free for anyone with a computer or console to download . Unlike the Candy Crush saga's freemium model, the game is completely playable without a single purchase being made. Only cosmetic purchases are available in the game and those do not affect gameplay in any way.[56]

[55] Nieborg DB. 2015, Crushing Candy: The Free-to-Play Game in Its Connective Commodity Form. Social Media + Society. From: doi:10.1177/2056305115621932

[56] Kain E. 2020 Call Of Duty: Modern Warfare' Breaks Franchise Records As Activision Posts Big Q1 Earnings.https://www.forbes.com/sites/erikkain/2020/05/05/call-of-duty-modern-warfare-breaks-franchise-records-as-activision-posts-big-q1-earnings/#38dc3f147ac1

Figure 10- Number of Call of duty Warzone players



https://www.statista.com/statistics/1110000/call-of-duty-warzone-players/

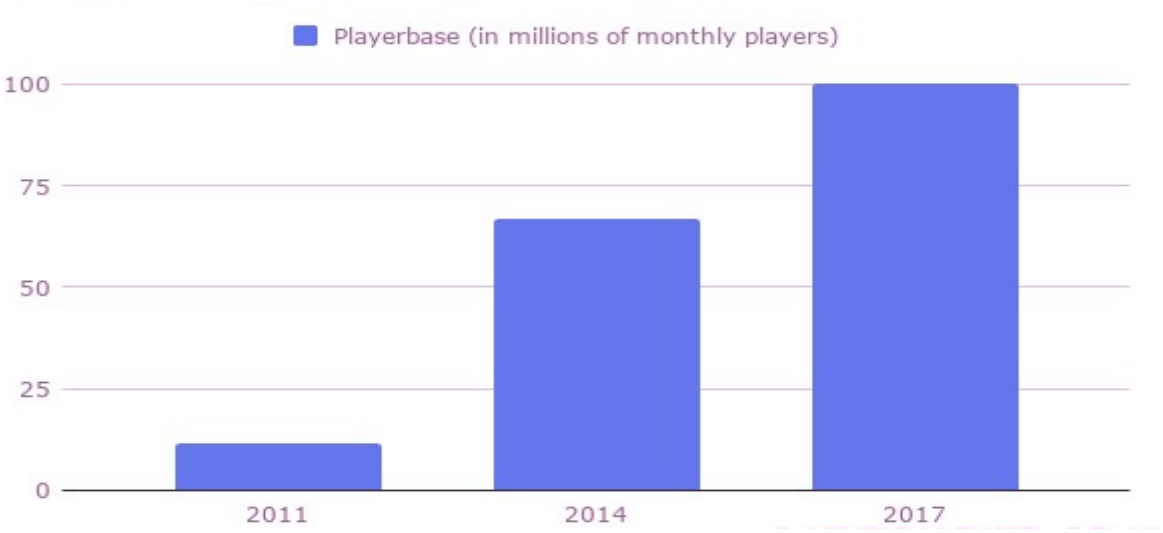
Figure 10 shows the amount of players playing Call of duty Warzone through March to May of 2020. The game's audience grew tenfold in only two months provided that the game was globally available from February of that year, many attribute the popularity growth to the Covid-19 pandemic which occurred during the timeline in the graphical representation but this was the first Call of duty game that was free to download since its inception in 2003.

4.3.3. League of Legends

League of Legends is a multiplayer online battle arena (MOBA) developed by Riot games for personal computers. League of legends, LOL abbreviated, consists of two teams of 5 players competing to destroy the base of the other team. The game contains more than a hundred unique champions with unique play styles which is why there is a heavily strategic aspect to the game. The game is completely free to play with no disadvantages to the non spenders, the microtransactions available in the game, similarly to Call of Duty Warzone are of cosmetic nature entirely. Users do not need to pay to access the full game features like the Candy Crush Saga. Another way of monetization which is occuring in game is the data collection from users of the game. After Riot Games got acquired by Tencent holdings ltd. in 2015, the company started gathering user data and using it for E-sports purposes, balance changes and game updates catered

to the players' needs but the company Tencent holdings ltd. was accused of many instances of exploiting user data.[57]

Figure 11- LOL monthly players over the years



https://www.superdataresearch.com/blog/worldwide-digital-games-market

Figure 11 shows the growth of the League of Legends player base over the period of 6 years. In that period League of legends reached a hundred million player mark. The growth of the game continued in this pattern but the information stopped being publicly available due to the company being fully acquired by Tencent. The latest public report shows that the company had 1.5 billion total revenues earned in 2019 from microtransactions. [58] With the game being both strategically and technically complex, it attracted a lot of attention from the competitive user base which is why the game developers implemented a successful ranking system which would rank players depending on their skill level. This caused a high demand for the spectating option of those players since users were interested to see the high rank players perform against each other and wanted to add the pressure of an audience to the mix. Most importantly, the competitive nature of this game brought light to a competitive scene where individuals compete in various video games to determine who is the best. This competitive scene evolved into Esports, one of the biggest growing phenomena in the world. The value of this digital product lies not only in the revenues it is earning but also in the attention this product is getting from a worldwide audience that watches it, discusses it, plays it and most importantly believes it is a sport.

[57] Perez M. 2019, Is There Life After 'League Of Legends'? Retrieved from: https://www.forbes.com/sites/mattperez/2019/10/15/is-there-life-after-league-of-legends-riot-bets-big-on-its-first-new-game-in-10-years/#3070a4d2edcb

[58] Super data research 2020, 2019 gaming review. Retrieved from: https://www.superdataresearch.com/2019-year-in-review?itemId=gg1y3xrgpf3tqako3u146pfips6x9z

5. ESPORTS THE GLOBAL PHENOMENA AND ITS BUSINESS APPLICATIONS

There is some hidden potential the biggest companies in the world are recognizing and investing in, some companies believe that Esports will be a standard component of modern sport. This chapter will cover the numbers behind Esports including revenues, audiences, investors, innovations and the massive growth of the industry in 2020. The first part of the chapter will cover the definition of Esports, Esports categories, biggest Esports organizations, current trends, users, revenue and formats. Next part of the chapter will examine the comparison of Esports to traditional sports with their differences and similarities, followed by a comparison to the NBA which is shockingly similar to the Esports model. Moving on, effects of the Covid-19 pandemic on the industry will be analyzed and finally, case studies of new digital products that have been created as a result of the growing popularity of Esports and finally digital technologies used in Esports with examples.

5.1 Esports definition, types and organisations

Electronic sports, cybersports, gaming, competitive computer gaming, and virtual sports are all synonyms for the term Esports. According to Wagner, Esports are defined as an area of sport activities in which people develop and train mental or physical abilities in the use of information and communication technologies.[59] Another definition separates Esports into two categories, one referring to competitive computer gaming and another to spectatorship. The combination of the two elements describes the true nature of Esports and that is spectating the perfected skill and coordination of professional players through digital platforms. Competitiveness of video games has reached global curiosity among the players which were left wondering who the best player is. With the development of digital platforms the option of spectating the best players has become a possibility and millions of viewers worldwide are tuning in to see the best digital gladiators perform under immense pressure and defeat other competitive players.[60]

The Esports scene started with an audience measured in thousand with very little reward for individuals that perfected their craft and competed in Esport titles. Multiplayer settings were very limited even 10 years ago and even without the limitations of the multiplayer environment, live

[59] Wagner, M. 2006. On the Scientific Relevance of eSports. In International Conference on Internet Computing (pp. 437-442)

[60] Freeman G. , Donghee Y. W. . 2017. ESports as An Emerging Research Context. Retrieved from https://dl.acm.org/doi/pdf/10.1145/3027063.3053158

streaming that environment to millions of spectators seemed impossible at the time. On the other hand, there were very few motivators for individuals to dedicate their lives to perfecting a video game performance since they would have little to no income from their dedication with prize pools being miniscule and sponsors having never heard of the industry. This is why the growth of Esports is attributed to two factors, one being the rise of digital technologies and the omnipresence of digital platforms where individuals can consume Esports in any given moment, anywhere in the world and at the same time streaming services, platforms and infrastructure for live broadcasting of the multiplayer environment has been fully developed and implemented. The other factor which refers to social motivators for competing in Esports. These factors include attention, fame, financial security, lifestyle and being considered an athlete. The biggest contributor to the success of the industry are the newly established influencers such as Pewdiepie, Markaplier, Ninja, Shroud and others that have amassed followings of hundreds of millions of users which are strictly interested in gaming content and among those hundreds of millions of followers exists the ones who enjoy competitions. The prize pools over the last 10 years have increased drastically with some reaching tens of millions of dollars in rewards. This incentivizes individuals to compete and participate, since a victory at such tournaments would make them financially secure for the remainder of their lives.[61]

The structure of Esports also evolved from small venues to hosting tournaments in the largest modern value available such as the Copper box arena in London with 4000 fans, KeyArena in Seattle with 10000 fans present, Staple Center in Los Angeles which hosted 12000 fans, Wembley Arena in London hosting 12500 fans and one of the largest events held in Sang- am World cup stadium with 45000 fans cheering and supporting their favorite Esprots athletes achieve success on the world stage. From basements to a stadium where the football world championships was held, Esports audiences are constantly growing and so are the prizes.[62]

[61] Pickell D. 2019, What is Esports and how did it become a billion dollar industry. Retrieved from: learn.g2.com/esports

[62] Guzman J. D. N. 2019, The World's biggest and best Esports arenas. Retrieved from: https://www.redbull.com/in-en/the-biggest-and-best-esports-stadiums-in-the-world

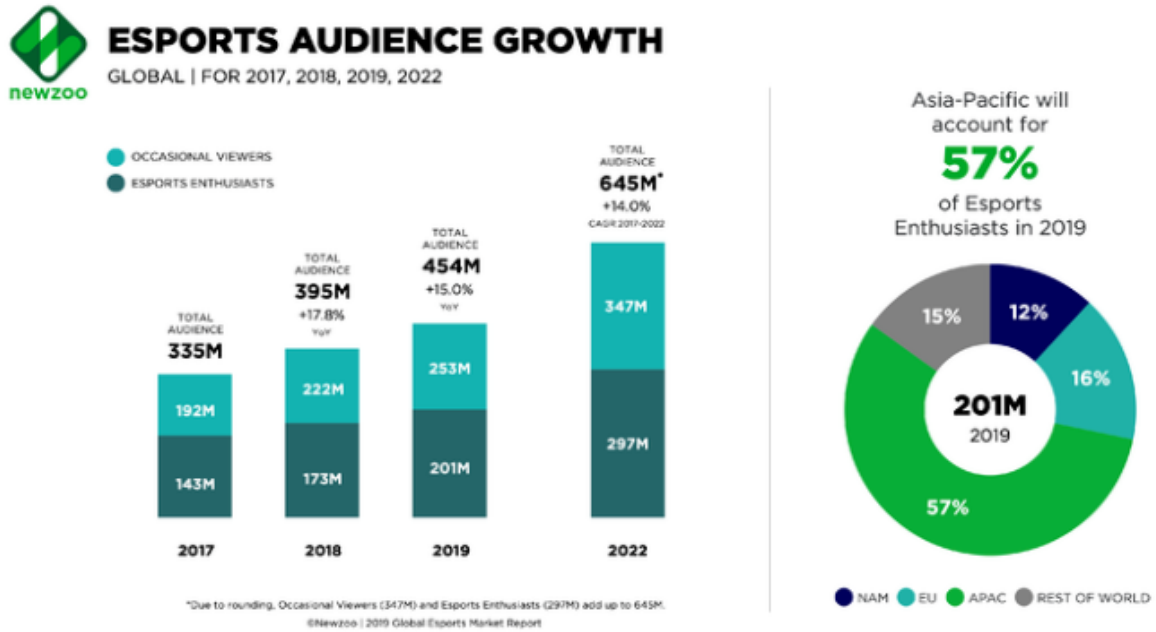
Figure 12- Biggest Esports prize pools in the last 5 years

1.	The International 2019	$34,330,069.00	*Dota 2*	18 Teams	90 Players
2.	The International 2018	$25,532,177.00	*Dota 2*	18 Teams	90 Players
3.	The International 2017	$24,687,919.00	*Dota 2*	18 Teams	90 Players
4.	The International 2016	$20,770,460.00	*Dota 2*	16 Teams	80 Players
5.	The International 2015	$18,429,613.05	*Dota 2*	16 Teams	80 Players
6.	Fortnite World Cup Finals 2019 - Solo	$15,287,500.00	*Fortnite*		100 Players
7.	Fortnite World Cup Finals 2019 - Duo	$15,100,000.00	*Fortnite*	50 Teams	100 Players
8.	The International 2014	$10,931,103.00	*Dota 2*	14 Teams	70 Players
9.	LoL 2018 World Championship	$6,450,000.00	*League of Legends*	24 Teams	131 Players
10.	LoL 2016 World Championship	$5,070,000.00	*League of Legends*	16 Teams	86 Players

https://www.esportsearnings.com/tournaments

Figure 12 shows the growth of the prize pool money from the earlier years where Esports was growing and today when Esports is a well established industry with over 34 million dollars prize money for a tournament hosted in 2019. The prize pools are growing with each year the competitions are held which can be seen in the figure, this is one of the indicators that the popularity of Esports is growing, number of participants increasing and most importantly the audience spectating both from live locations and from home is growing.

Figure 13- Esports audience growth



https://learn.g2.com/esports

Figure 13 represents the growth of the Esports audience with predictions for the year 2022. The audience in 2017 is estimated nearly to double by the year 2022 both the numbers of occasional viewers and Esports enthusiasts increased drastically every year. The figure also displays an interesting infographic about the demographics of Esports viewers and it shows that the Asia-Pacific region accounts for the most Esports views in the year 2019. The other regions combined do not match the regions viewership numbers which compared to the case study in the literature report suggest that China has incorporated Esports into their sports structure effectively since the majority of viewers of that region are Chinese.

Moreover, the biggest Esport tournament in the 2019 event reached over 100 million unique viewers, The League of Legends world championship peaked at 44 million concurrent viewers watching the finals and with over a 100 million unique viewers watching the entire event. The particularly interesting thing about this event is that a chinese team made the finals which is why it is speculated that 60% of the entire finals viewership were chinese.[63]

Having covered the massive audience of Esports, the paper will cover how revenues were gathered from the clicks, minutes and hours watched. Deloitte is reporting a dramatical return on investment for Esports investments made in 2018. Deloitte states that venture capitals have taken the role of lead investors overthrowing smaller companies investing into the industry since Esports are recording an unprecedented return on investment ranging from 2014 to 2018. The ratio of venture capitals compared to other companies is reportedly 80:20. Deloitte also claims that the most valuable component these investors are seeking are media platforms of Esports, and developers linked with the industry. Similarly to traditional sports, companies are investing into organizations with big names in the Esports industry due to the massive platforms these individuals have for expressing themselves and thus representing investor's products. Names like Faker, Ninja, Bjergsen, Doublelift, Tfue Shroud and others have shown the size of their fan base and have piqued the interest of even the biggest companies in the world.[64]

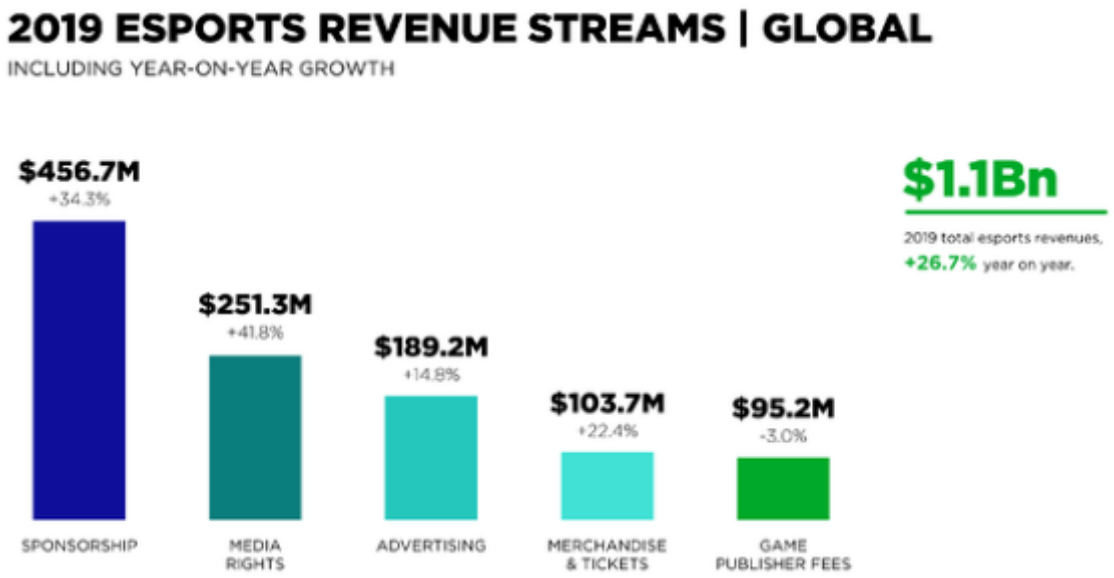
According to information provided by the Business insider, the biggest companies that have invested into the Esports industry are : Coca Cola, Mountain Dew, T-mobile, Nike, Adidas, Intel, Airbus, Mastercard, Red Bull, Kia, Honda, BMW, Audi, Google, Amazon, Tencent holdings ltd. and many more. These companies have invested into different streams of Esports revenue which

[63] Webb K. 2019, More than 100 million people watched the 'League of Legends' World Championship, cementing its place as the most popular esport. Retrieved from: https://www.businessinsider.com/league-of-legends-world-championship-100-million-viewers-2019-12

[64] Deloitte 2019, The rise of Esports investments. Retrieved from:https://www2.deloitte.com/content/dam/Deloitte/us/Documents/finance/drfa-rise-of-esports-investments.pdf

include Sponsorships, media rights, advertising, merchandise and tickets, and game publisher fees and other Esports related products. [65]

Figure 14- Esports revenues of 2019



https://learn.g2.com/esports

Figure 14 shows the various streams of revenue emerging from Esports which the investors are trying to tap into. The figure also illustrates a 26.7% growth of Esports revenues compared to last year which is a positive sign for any potential investor into the industry. Moreover, the most lucrative revenue comes from the sponsorships of Esport content and similarly to traditional sports this is the area where companies want to invest the most. The current trends projected show that the industry hasn't peaked yet meaning more revenues will occur and with that more investors will consider investing.

Having defined Esports and analyzed the revenues associated with the Esports industry, different categories of Esports will be defined along with the organizations that were created as a result of Esports becoming overwhelmingly popular. The game categories professional Esports players currently compete in can be divided into:

- PvP (Player versus Player)- this category of games refers to games where players need to individually perform one another solely based on reflexes and practise. The most popular format of the games is 1 versus 1, where players show who has mastered the game

[65] Meola A. 2018, The biggest companies sponsoring eSports teams and tournaments. Retrieved from: https://www.businessinsider.com/top-esports-sponsors-gaming-sponsorships-2018-1

mechanically and try to outsmart one another. Examples of these Esports are Super smash bros, Wow arena pvp.

- FPS (First Person Shooter)- this category is filled with games that simulate war conditions and in which the player assumes the role of a soldier in the field of combat. The Esport professionals compete with one another by limit testing their mechanical skill paired with the teamwork and coordination they need to have with their team members. There are smaller segments of strategy involved; the former skills are more important. Examples of such an Esport are Call of Duty Warzone and Counter Strike GO and Fortnite.
- RTS (Real-time Strategy)- this category includes games in which users use their wits, developed strategies and intelligence to outsmart the other player. Games of this type are immensely popular in the mobile gaming industry as most of the strategy game types have been transported into the mobile format. Examples of this Esport include Clash Royale and Starcraft.
- MOBA (Multiplayer online battle arena)- This type of game requires team members to co-operate with each other in acquiring resources and taking objectives from the opposing team. Competencies required to participate in this Esport are: high level of teamwork, team mindset, strategy and theorycrafting, fast reflexes and practiced mechanics. This is the biggest Esport attracting the most attention from viewers due to the complexity of the games under this category and the dedication of players that have honed their craft for over 10 years. Games in this category include the massive titles like League of Legends (LoL) and Defense of the Ancients (Dota).[66]

Esport competitors had difficulties getting Visas to get into certain countries and participate in tournaments, they also had issues with taxation of their prize earnings, revenues from social and other media platforms and with general organisation. This is why Esports organizations were founded to hire players, pay salaries and deal with the issues Esport players are facing outside of the game. These organizations have developed into full fledged sports organizations having large coaching staffs, nutritionists, chefs, sport psychologists, analysts and other essential workers. According to Forbes most valuable Esport organizations include:

- **Team solo mid (TSM)**- an Esports organization founded in the United States by Andy Dinh in 2009. It started as a website with game guides and afterwards started recruiting players for tournaments. With the massive popularity of the teams performing under the

[66] Petrullo L. 2019, The different genres of Esports explained. from: https://americanesports.net/blog/the-different-genres-of-esports-explained/

name of TSM, large companies and proper managers joined the organization and turned it into a respectable Esports organization. The organization competes in every category of Esports and is achieving phenomenal success. The prize winnings are just the cherry on top of this organization as it creates Esport superstars such as Bjergsen and Doublelift which add marketing value to the company. Forbes estimates the networth of this organization at 400 million dollars.

- **Team Liquid (TL)**- a multiregional Esports organization located in Netherlands which was founded in 2000. The organization grew with their success in various Esports titles until the controlling shares were sold to an investment group most notably, consisting of Peter Guber the golden state warriors co-owner, Magic Johnson, Disney and others. The current CEO of Team Liquid is Bruce Stein, the former CEO of Sony interactive entertainment. With such strong management the company achieved enormous growth in the industry and according to Forbes is valued at 320 million dollars.[67]
- **100 Thieves (100T)-** a lifestyle brand and gaming organization based in Los Angeles, California. Formed in 2014 by Mathew Haag and showed growth from the day of its inception. The organization competes in most of the available Esports categories but it didn't receive massive funding due to its competitive success but rather due to its approach. Their approach is to present gaming as a lifestyle, being a gamer is cool, selling gaming apparel and many social media stunts such as having a team house located in Beverly Hills neighbouring, multiple celebrities in that area. The notable investors of this organization are: owner of the Cleveland Cavaliers Dan Gilbert, rapper Drake and Drew Houston (owner of Dropbox). [68]

5.2 Comparison to traditional sports

In 2020, Esports are on the verge of entering the Olympic sport games in Tokyo that have been delayed due to the Covid-19 Pandemic. Esports were supposed to be included as a part of the Intel World Open that would have taken part in Tokyo during the olympics. This announcement has brought back the controversial topic of should Esports be considered a sport. [69] Some of the noticeable similarities between sports and Esports are particularly apparent: training which is

[67] Settimi C. 2019, Awful business or the new gold rush? Most valuable companies in Esports . From:https://www.forbes.com/sites/christinasettimi/2019/11/05/awful-business-or-the-new-gold-rush-the-most-valuable-companies-in-esports-are-surging/#11828745324d

[68] Perez M. 2019, 100 Thieves raises 35 millions in Series B. Retrieved from: https://www.forbes.com/sites/mattperez/2019/07/16/esports-company-100-thieves-raises-35-million-in-series-b/#196289d74b15

[69] Intel, 2020, Intel World Open Tokyo. Retrieved from: https://www.intelworldopen.gg/

supervised by coaches, competitions such as championships, cups & trophies for winners, hardware improvement (high performance mouses and keyboards) in order to improve player performance. Currently, teams have sports psychologists, nutritionists, investment from sports clubs and their gameplay is sometimes broadcasted on traditional sports channels. Some colleges even offer Esports scholarships recognizing them as athletes. Despite these characteristics and codes that Esports try to emulate from sports are not enough to compare these two contemporary practices. Certainly, some of these characteristics are not specific only to sports. In order to reveal the core similarities between sports and Esports, it is firstly necessary to deconstruct the term sports so that we can define what a traditional sport is. Sport is defined as a physical activity, movement, effort put in order to achieve results in a competitive environment. The emphasis of this definition is placed on energy expenditure, which if we look at Olympic games as the ultimate sporting event, has categories such as golf, archery and curling that do not fit the energy expenditure criteria. The modern definition of sport includes 4 main criteria which are: energy expenditure, motor skills, competition and finally regulation.[70] The first criteria of energy expenditure can be found in every form of Esports due to the fact that mental effort expends extra amounts of energy paired with a study that suggests that time under stress makes humans tired, somewhat covers the energy expenditure criteria. It is important to note that not all official sports fit this criteria as snooker, darts and chess has been recognized as a sport in some countries. The second criteria of sports is motor skills. This criteria is present everywhere in the Esports professional scene as competitive players are displaying incredible hand to eye coordination, sharp reflexes and quick decision making. In regards to the second sports criteria Esports fulfill it completely. Moving on to the third criteria of sports which is competition competition, this is the essence of Esports and how it came to exist. Individuals wondering how the best ranking players of certain Esports categories performed against one another, how would these individuals react in highly stressful environments and which among them are true champions. This criteria is fulfilled entirely as Esports and competition are practically synonymous. Final criteria of the comparison is regulation. This criteria is completely different when comparing Esports and traditional sports. The regulation in traditional sports is done by entire sports federations, massive organizations that need to vote and propose changes, ideas for them to ever be implemented while Esports are governed by the company that owns the particular game and can affect the rules and state of the game as it sees fit. Despite this, Esports follow strict rules as organizations participating in the

[70] Besombes N. 2017, Comparison between sports and esports through the lens of the sociology of sport. 10.13140/RG.2.2.11174.52807.

industry have close relationships with traditional sport and are following strict guidelines. [71] Monetization wise, traditional sports and Esports follow very similar revenue models as mentioned above in this chapter. The key distinction is the platform where they are consumed on and the age demographics of the spectators. The demographic that is engaged in the Esport industry mostly ranges from 16-24 years of age with a lot of users being 5 years above or below what average. Compared to traditional sport that is predominantly followed by an older audience whose average viewer is 50 years old.[72] The second distinct difference is the platform of consumption, while traditional sports are broadcasted on television, Esports are broadcasted on digital platforms while traditional sports are lagging behind the digital broadcasting except the NBA which is combining traditional television viewership with a strong online presence.

5.2.1 Comparison to the NBA

Many NBA superstars such as Micheal Jordan, Schaquile O'Neal, Kevin Durant, Steph Curry, Rick Fox and co-owners of teams have invested in Esports over the last couple of years. Golden gate warriors even founded their own Esports organization called Golden Guardians.[73] Coincidentally, during the Covid-19 pandemic, the digital version of NBA called NBA 2K received massive attention as an Esport since the play of NBA was halted and even NBA professional players participated in live tournaments. There is a certain correlation between NBA and Esports since many NBA experts are confident investing into this new market as they believe that there are visible similarities between the two and are confident they can make a profit. Both Esports and NBA are team sports with relatively similar infrastructures consisting of players,coaches, trainers, analysts and other essential sports personnel. With a lot of similarities regarding their sport structures, the biggest differences lie in the audiences NBA is achieving and the massive revenue earned through NBA. It could be argued that Esports have similar revenue models to those of the NBA but with lower proportions of revenue in comparison. The biggest similarities in the business model of the two has recently been formed and that is the way the NBA is being broadcasted to the rest of the world. The NBA currently offers multiple methods of broadcasting of their games through their website, television channels and mobile application. Esports are currently broadcasted on all platforms mentioned but offer unique viewing options to

[71] International olympic committee 2012, Evaluation criteria for sports and disciplines. Retrieved from:https://stillmed.olympic.org/Documents/Commissions_PDFfiles/Programme_commission/2012-06-12-IOC-evaluation-criteria-for-sports-and-disciplines.docx.pdf

[72] Kemp S.2019, Digital 2019, Understanding the Esports opportunity. Retrieved from: https://datareportal.com/reports/digital-2019-understanding-the-esports-opportunity

[73] Huddlestone T. 2018, The athletes who have invested millions into Esports. Retrieved from: https://www.cnbc.com/2018/12/19/from-michael-jordan-to-drake-athletes-celebrities-invested-millions-esports.html

their spectators. Option such as viewing the game from player perspective,choosing from multiple showcasters, view of certain angles and a large amount of statistical information is fused into the interface[74]. This however, is changing as the NBA has announced the release of NBA Digital application which will offer viewers new angles and newing options. Over 30 robotic cameras will be implemented and many user options will be added to all of NBA's platforms which will make the user experience even more similar to the Esports.[75]

5.3 Esports during the Covid-19 pandemic

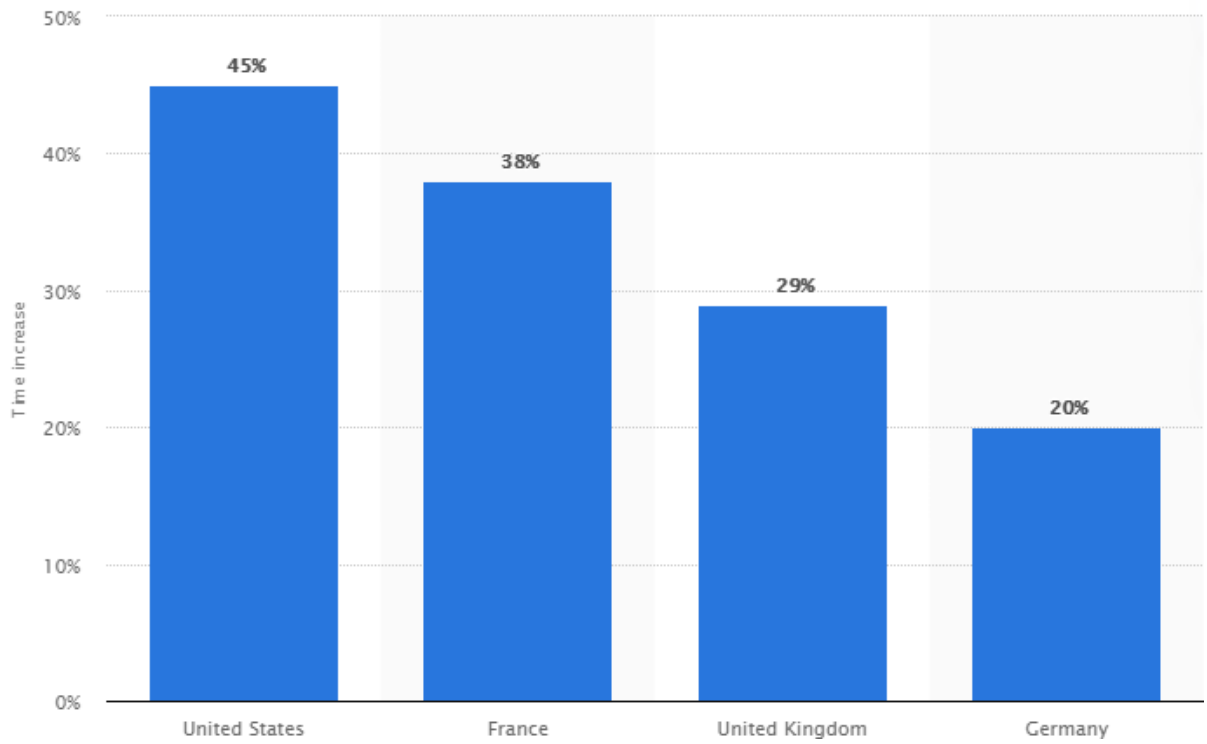
During the lockdown induced by the Covid-19 pandemic, the gaming and Esports industry have been thriving. According to an article in the Guardian, the gaming industry is reaping massive profits due to the stagnation of other entertainment activities. Free time options have become limited and thus making video games a very convenient time killing option. This directly affects the popularity of Esports as more and more people spend time playing games.[76] An online survey has been conducted which had 1200 participants that indulge in gaming during their free time. The survey shows how the pandemic affected the relationship with their hobby.

[74] Rogers, R., Farquhar, L., & Mummert, J. 2020. Motivational Differences Among Viewers of Traditional Sports, Esports, and NBA 2K League. Communication & Sport, 216747952094273. doi:10.1177/2167479520942738

[75] NBA 2020, NBA to unveil unique in venue and broadcasting enhancements for the 2019-2020 season. Retrieved from :https://www.nba.com/article/2020/07/24/in-venue-and-broadcast-enhancements-2019-20-official-release

[76] Heinrich S .2020, Esports ride crest of a wave as figures rocket during Covid-19 crisis. Retrieved from:https://www.theguardian.com/sport/2020/apr/11/esports-ride-crest-of-a-wave-as-figures-rocket-during-covid-19-crisis

Figure 15- Increased time spent gaming during the Covid-19 pandemic



https://www.statista.com/statistics/1111587/video-game-time-spent-covid/

Figure 15 shows how the average time spent gaming increased for users in the surveyed countries. This shows that contrary to other industries having a negative trend on their performances, Esports and the video games industry had a growth during that period.

Other companies that have reported profits during the pandemic are Netflix, Google and Amazon. Similarly to those companies Esports and video games offer an entertainment product in a period where concerts, public gatherings and other forms of entertainment were canceled. But the main advantage of Esports is that all of the Esports competitions have been carried out completely. With a pause period of 4 weeks, the Esports scene resumed normally while streaming competitions from the players' computers rather than in gaming studios. This shift decreased the production quality of those matches played but it made sure that the competitions were carried out and viewership stayed high. Game servers of companies were reaching maximum capacity due to the increase in the number of active players at one time which forced professional players to practice in the morning hours in order to avoid poor server performance. This demonstrated the

versatility of the Esports as an industry where their entire infrastructure was able to work at home and continue the production, broadcasting and execution of tournaments.[77]

5.4 Digital technologies used in Esports and the gaming industry

Esports would not exist without the widespread use of digital technologies in our everyday lives. Both video games and their platform, Esports have benefited greatly from the development of these technologies and are benefit still by the technologies that are still being developed. This chapter will cover the technologies used in the gaming industry and in Esports with examples. The vital technologies explored will be game servers, cloud computing, mobile technologies and VR.

5.4.1 Game servers

Game servers represent the servers which are responsible for communicating with game clients that the users are connected to. They are defined as authoritative sources of events in the multiplayer environment. The server transmits data to connected game clients and provides their own accurate version of the game. The part of the definition which states their own version of the game refers to the latency between the client and server. This means that the server is always ahead of the client which in the industry of gaming is a very big obstacle since this is the defining factor between the users input and the servers reactions.The time it takes for packets to travel to the server is called latency. The term latency refers to the network connection between the client and the server. This connection is responsible for the user experience in multiplayer online games as their actions need to travel between the client and server constantly with each delay being a constraint on the user experience and ruining the competitiveness. This is the reason why game developers are responsible for minimizing such delays that are within their responsibility and place servers near the largest user population in order to reduce the latency.[78]

Game developers run their own game servers and have difficulties maintaining unnoticeable latency across large regions. Certain game companies are hosting game servers such as Google's game servers or Raidbox to minimize latency through their network of hosted servers near large populations in regions. In online games latency is measured by ping, a ping of 20 means it takes the server 20 milliseconds to receive an user command from the client. But even this isn't enough

[77] Kriz WC.2020, Gaming in the Time of COVID-19. Simulation & Gaming.;51(4):403-410. doi:10.1177/1046878120931602

[78] Emmerich P., Raumer D., Wohlfart F. and Carle G. 2014, "A study of network stack latency for game servers," 13th Annual Workshop on Network and Systems Support for Games, Nagoya, 2014, pp. 1-6, doi: 10.1109/NetGames.2014.7008960.

to create a competitive environment due to the fact that an individual near high population has the upper hand over users in less populated areas of a region due to ping. A click from a 100 ping user takes 10 times longer to reach the server than a click from a 10 ping user. This is why Esports tournaments are held in zero ping environments using the Local Area Network(LAN) connection. Casual users won't have any disturbances in their experiences as game servers of large companies such as Google are fully functional and offer moderate ping to their users. Game servers can also be overloaded, this is why large game developers are using both their servers and backup servers to prevent any disruption of service and loss of revenue.[79]

5.4.2. Cloud computing in Esports and gaming industry

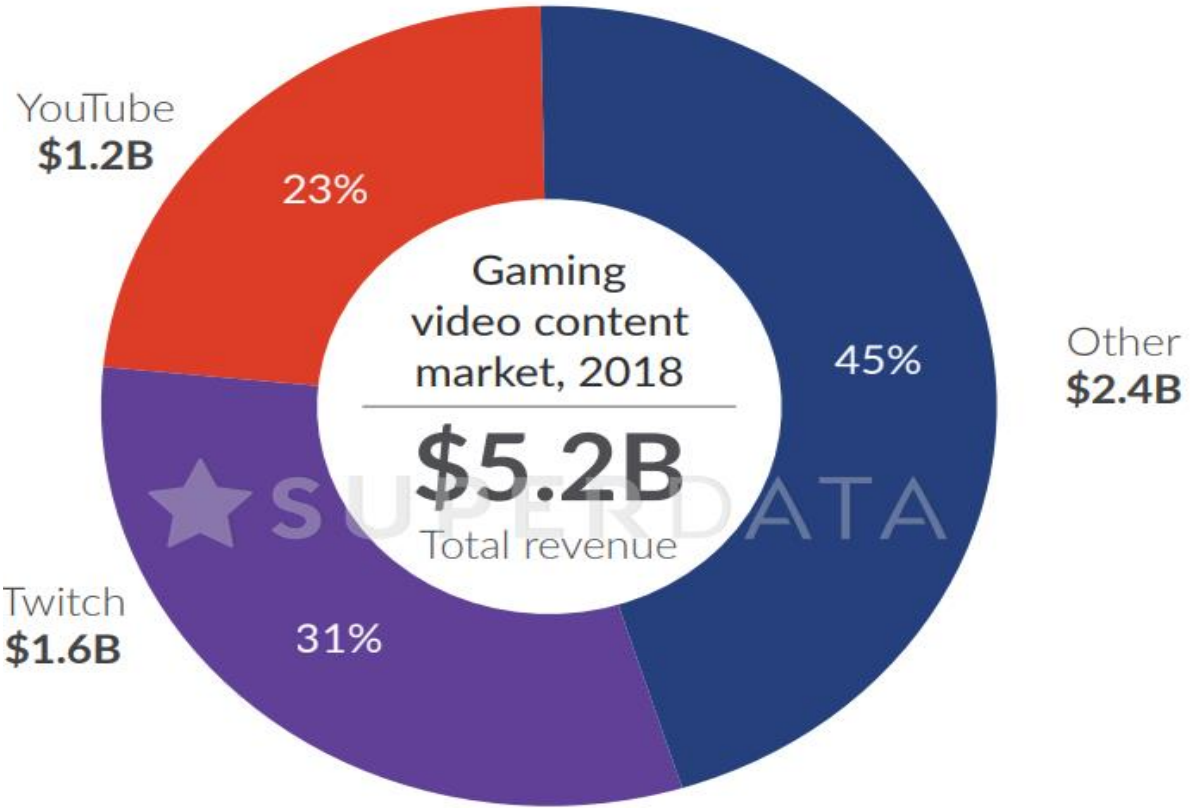
Esports owes its broadcasting platform to the cloud technologies, without them streaming live digital competitions to millions of spectators would be impossible. Currently, the most popular Esports and gaming content streaming platforms are: Twitch, Youtube gaming and Mixer. The three video game streaming platforms are owned by none other than Amazon(Twitch) , Google(Youtube) and Microsoft (Mixer).

Each of these companies use their own cloud computing services to enable the live streaming of millions of hours of content, which is also stored for a period of time so users can watch previous streams of their favorite content creators. Microsoft is using Microsoft Azure for its streaming platform while Amazon uses Amazon web services (AWS) and finally google uses google cloud. [80]

[79] Kim J. , Spjut J. , McGuire M. 2019, Esports Arms Race: Latency and Refresh Rate for Competitive Gaming Tasks. Retrieved from: doi:10.1167/19.10.218c

[80] Deloitte 2019, The rise of Esports investments. Retrieved from: https://www2.deloitte.com/content/dam/Deloitte/us/Documents/finance/drfa-rise-of-esports-investments.

Figure 16- Distribution of gaming video content across platforms.



https://adindex.ru/files2/access/2019_01/230617_SuperData%202018%20Year%20in%20Review.pdf

Figure 16 displays the revenue the video game streaming platforms have acquired in the year 2018 . This illustration shows that Twitch was the most popular streaming platform in 2018 followed by Youtube and then came other platforms including Mixer which was relatively small at the due to being a new platform on the market and the other two existing for a longer period of time. Interestingly, video game streamers are signing exclusivity agreements with certain platforms, most notably Ninja and Shroud signing for Mixer which limits them to only streaming on the mixer platform and prohibits them from interacting with the competing platforms. This on the other hand, is not a trend in Esports as streams of competitive tournaments are available at all platforms at any time but Twitch, as shown in this infographic has the highest numbers compared to other video game streaming platforms.

5.4.3. Virtual Reality in the gaming industry

Virtual reality is the future of gaming, current video games are focusing on immersing their players into virtual worlds where anything is possible. Immersive user experience is the goal of

every game developer and virtual reality technologies seem to be the way of achieving that. Virtual reality gadgets that are currently in development are connected to existing gaming platforms such as PC, console and mobile phones.

- Virtual technologies in the gaming industry which are played on computer platforms bring the best quality of gaming experience and most detailed environments by using equipment such as the headsets from Facebook (Oculus rift), HTC (Vive) and Lenovo (Explorer).
- Another gaming platform supporting virtual reality technologies are consoles which offer similar content like computers but are limited to the specific components of the consoles.Example of that is Sony Playstation VR.

- The final platform for virtual reality gaming are mobile phones, the most widespread platform currently available. Mobile phone manufacturers are developing their own controllers and video games.[81]

A very successful implementation of very simple Augmented and Mixed reality technologies is the Pokemon GO mobile game. It combined GPS services with the phone's camera to project an augmented reality where creatures would appear next to real life objects in the real life environment. The game was launched by one of Google' companies called Niantic Inc. in 2016. The game was so well received it reached worldwide popularity within days of being released. Google's servers constantly crash and reboot due to the overwhelming traffic. [82]

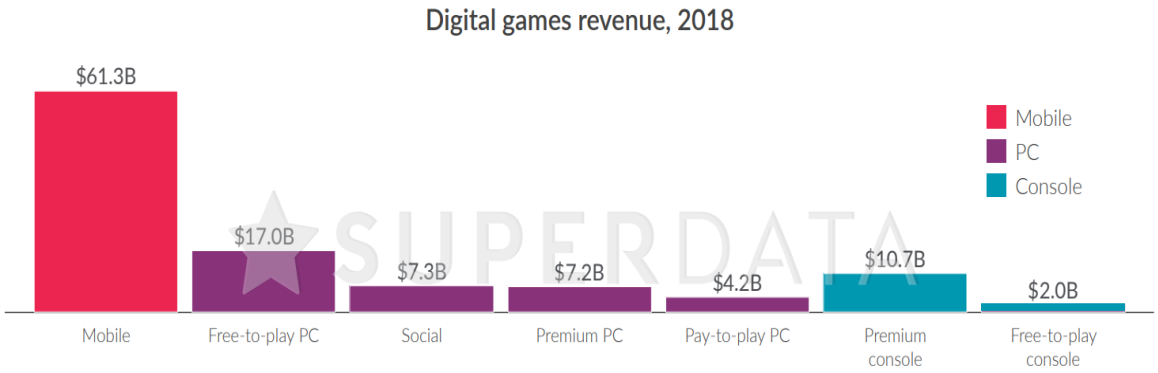
5.4.4. Mobile technologies in the Esports and gaming industry

Mobile technologies were a key concept for both Esports reaching massive audiences and for increasing the revenues in those industries. Having analyzed how widespread the mobile technologies are, there is no doubt to their importance in the current state of the gaming and Esports industry.

[81] Lenovo 2019, What is VR gaming? Retrieved from: https://www.lenovo.com/us/en/faqs/gaming/what-is-virtual-reality-gaming/

[82] Rauschnabel A. , Rossmann A. , Dieck C. 2017, An adoption framework for mobile augmented reality games: The case of Pokémon Go

Figure 17- Digital Games revenue in 2018



https://adindex.ru/files2/access/2019_01/230617_SuperData%202018%20Year%20in%20Review.pdf

Figure 17 illustrates the gap between mobile game's revenue and the revenue gathered from other platforms where video games are available for purchase. This can be explained by the number of users which possess smartphones and tablets as opposed to the number of users on the other platforms. Another thing to keep in mind is the vast variety of monetization practices available on mobile games which are even considered predatory in some scenarios. Games such as the Candy crush saga, Angry bird, Fruit ninja and other similar games encourage a lot of hidden monteziation in their business models and reap massive profits due to the large numbers of users.

Currently, a trend exists where big developing companies are creating mobile ports of their popular PC Esports titles in order to reach the broader audiences the mobile platforms have to offer. Successful implementations of this include Fortnite mobile, PUBG mobile and Call of Duty mobile versions. The mobile versions are different from their Pc counterparts suited to the more casual audience with more monetization and hundreds of millions of downloads. [83]

[83] Kain E. 2018, Fortnite mobile vs PUBG mobil. Which mobile game is better. Retrieved from:https://www.forbes.com/sites/erikkain/2018/03/29/fortnite-vs-pubg-on-ios-and-android-which-mobile-battle-royale-is-better/#33b86fe6f83d

6. CASE STUDIES OF UNIQUE DIGITAL PRODUCTS AND PLATFORMS

6.1. Design and methodology of research

6.1.1. Research objectives

This chapter has two objectives. One is analyzing the projects used in the case studies by measuring the success of the implementation, state before the implementation and after the implementation, methods used in the case studies and finally the results of the decisions made by companies analyzed in those case studies. The second objective is comparing the case studies with theoretical concepts defined in this paper including type of digital product, monetization model, digital technologies deployed and Esports involvement.

6.1.2. Research Methodology

While analysing digital products and services there were three case studies where all elements of this paper were present. The three case studies analyzed in this chapter are very successful adaptations of digital products into existing business models and are defined as unique since no digital form of those products existed before their implementation. The parameter for evaluating the success of these products will be the monetary value they have accumulated. After the case studies are analyzed the results will be examined and compared in order to determine common features of these case studies and where they differentiate from one another.

6.2. Case study on Twitch

Twitch is a video live streaming platform with the primary focus being on video game live streaming of both Esport competitions and casual user gameplay. The site also offers non video game live streams such as music listening and lifestyle activities. The company was founded in 2011 by Justin Kan and Emmett Shear as a general interest streaming platform where users can livestream basically anything they feel like livestreaming within the company guidelines. The company notices a high demand for video game content live streamed on the website and shifted their focus into making their platform specialize in gaming by partnering with Esports organisations, game developers and gaming experts. [84]

[84] Johnson M. , Woodcock J. 2018. The impacts of live streaming and Twitch.tv on the video game industry. Media Culture & Society. 10.1177/0163443718818363.

6.2.1. The problem

Twitch encountered two unsolvable problems in 2013, first of which was due to the platform achieving massive growth after transitioning to video game streaming and defining themselves as a video game streaming platform. The company stated that in October of 2013 the platform had over 45 million unique viewers consuming the live streamed content. This caused enormous strain on the company's servers which were not only responsible for broadcasting of live streams but also for storing past streaming content for a period of 7 days and popular streaming highlights forever. The company at the time was using a form of microtransactions which were concluded among the users themselves in the form of monthly subscriptions to streaming channels and Twitch was taking a commission per subscription made. This monetization model was not able to cover for the expenses which were incurring due to the server traffic caused by the massive viewership and content stored. Following that business model the company would go out of business without any financial support from the investors. The second problem that arose was the legal climate in the digital streaming industries. Most notably, companies which owned record labels and other music related intellectual property were filing lawsuits against Twitch for allowing their users to use copyrighted music in their streams. Similar situation happened to Youtube in 2006 where the legal pressure from the new copyright laws regarding reproduction of musical content under the ownership of record labels encouraged the acquisition of Youtube by Google. The company was facing financial difficulties with no feasible solutions for both of their undergoing problems in 2013.[85]

6.2.2. The solution

During the beginning of 2014 a bidding war between Google and Amazon started as the platform was ready for acquisition and merger into the existing ecosystems of those two digital giants. Google backed out of the bidding war after Amazon offered 1 billion dollars for the acquisition of Twitch. Google did not see it as a worthy investment as they already owned the biggest video streaming platform, Youtube and did not see the value of the platform. Amazon seized the opportunity to acquire Twitch as it served as an entrance to the gaming and Esports industry. CEO of Amazon, Jeff Bezos stated that like Twitch, Amazon shares its focus on customers and shares the same point of view when it comes to thinking differently, concluding with Amazon is delighted to provide new services for the gaming industry. This statement turned out to be a

[85] Ask, K., Spilker, H. S., Hansen, M. 2019. The politics of user-platform relationships: Co-scripting live-streaming on Twitch.tv. *First Monday*, *24*(7). https://doi.org/10.5210/fm.v24i7.9648

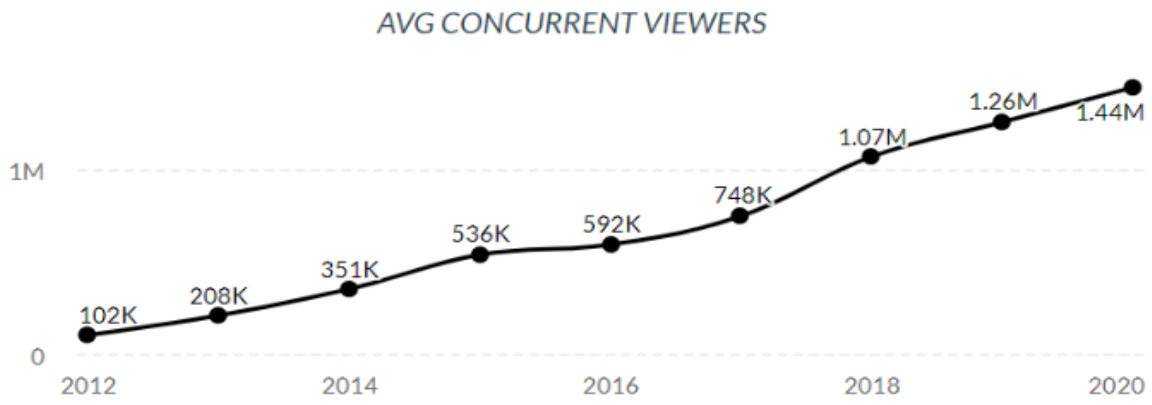
prediction as Amazon offered solutions to the hardships Twitch was facing.[86] The first hardship Twitch was facing prior to being acquired was traffic and monetization. Amazon dealt with overwhelming traffic by transferring the platform to Amazon web services (AWS) which is a powerful cloud computing platform capable of live streaming, storing and sorting out digital content provided by the platform. The monetization component was still problematic which is why Amazon implemented multiple forms of monetization on the platform in order to insure maximum revenue from the active unique users. The old user subscriber commision methods were still used along with the benefits of having Amazon Prime and Amazon Turbo options on the platform which allowed users access to additional options on the website like communicating with popular streamers, skipping ads and special emoticons. The other type of monetization implemented was sponsorships. The company partnered with the biggest titles in Esports to encourage broadcasting over Twitch along with in-game items being distributed during live Esports events called Twitch !Drops which increased the viewership on the platform. Spectators have more incentive than ever to spectate matches on Twitch as compared to its competitors Google gaming and Mixer. Finally, Amazon offered a permanent solution to the legal and copyright issues regarding record labels and use of intellectual property. The company has a music library called Amazon music which can be used on the platform without reprecaussinos and also Amazon is partnered with multiple record labels which allow fair use of their intellectual property.

6.2.3. The result

Amazon's acquisition of Twitch was declared a success due to the massive increase in the net worth of the company coupled by an increase of revenues generated and an increase of audiences participating in the platform. In 2014, the networth of Twitch was estimated to be a billion dollars. In 2020 the company is valued at 5 billion dollars and this estimation was before the Covid-19 pandemic where the platform experienced a drastic increase in user base due to lockdowns.

[86] Mac R. 2014, Amazon Pounces On Twitch After Google Balks Due To Antitrust Concerns. Retrieved from: https://www.forbes.com/sites/ryanmac/2014/08/25/amazon-pounces-on-twitch-after-google-balks-due-to-antitrust-concerns/#119a9fd35ab6

Figure 18- Number of average concurrent viewers on Twitch from 2012-2020



https://www.businessofapps.com/data/twitch-statistics/#3

Figure 18 shows the growth of average concurrent users on Twitch from 2012-2020. Focusing on the year 2014 when Amazon acquired Twitch we can see a drastic spike in viewership once the company got comfortable managing the video game streaming platform and reached the high number of 1.44 million concurrent viewers on their acquired platform. Research conducted by the Business insider reveals that Twitch earned 1.5 billion dollars in revenue which is more than Youtube gaming earned at 1.4 billion dollars. While there have been decreases in the Ad revenue collected on the platform, it is mainly due to other methods of monetization removing ads from paying users which shows the success of their monetization in the gaming industry.[87]

6.3. Case study of the LOL and LV collaboration

The first company participating in this collaboration is Riot gaming which are the owners of League of Legends (LOL) video game. The game is a multiplayer online battle arena (MOBA) which has been crowned as the king of Esports in 2019. The company hosts massive Esports events, where artists such as the Imagine Dragons perform during opening ceremonies in the most popular venues available in the world. The other company, Louis Vuitton abbreviated as LV, is a french fashion house and luxury dealer company founded in 1854. The company is dominating the luxury product industry with their large product line consisting of apparel,footwear, sunglasses and jewelry. Their business model has a very successful e-commerce application which is resulting in millions of worldwide sales. The company operates in

[87] Anad P. 2020, How big is Amazon's Twitch?. Retrieved from: https://www.theinformation.com/articles/how-big-is-amazons-twitch-revenues-reveal-ad-struggles

50 countries with more than 460 brick and mortar stores worldwide. These two companies seemingly have nothing in common as one is a video game provider while the other is a luxury brand. However, the two companies managed to create an unique digital product of unique value by cooperating together and developing something that has never been done before.

6.3.1. The problem

Louis Vuitton was a late responder to the developing gaming industry compared to its luxury brand competitors like Gucci and Versace who have designed sportswear for gamers that is comfortable and stylish. Following their trends, Louis Vuitton attempted to add luxury products to their web shops targeting gamers with little success. Gamers were introduced to the Gucci and Versaci luxury brands by seeing their favorite Esports athletes wearing the luxurious sportswear in tournaments, social media and in their free time. Louis Vuitton had very limited partnering options when it came to Esports organizations since the most influential organizations were either paired with traditional sportswear companies like Nike, Adidas or with luxury brands Gucci and Versace. [88] Having missed the opportunity to promote their brand through Esports, the company needed to find an alternative in order to successfully enter the gaming industry's market.

6.3.2. The solution

Louis Vuitton decided to collaborate with the most successful Esports title, League of Legends. The initial agreement of the collaboration was that Louis Vuitton would design the League of Legends champion trophy but the continued negotiations resulted in a completely new and unique digital product, Louis Vuitton x League of Legends champion skins. Skins in League of Legends represent alternative appearances for hundreds of existing champions in the game, they are used as a form of microtransactions where players can make purchases to differentiate themselves from other players. First successful implementation of a similar product was virtual team jerseys which were copied from the existing Esports team jerseys into digital form. However, the new digital product had no physical counterpart and was designed by the luxury brands' very best fashion designers. Five new League of Legends skins were added for 5 different existing champions which were wearing Louis Vuitton clothing with a clearly visible LV logo on them. As a massive promotion tool, the collaborating companies hired 5 musicians to form a group called True damage. The League of Legends x LV skins were named the same, as the music

[88] Cambe P. 2020, Luxury brands teaming up with gamers, here is why. Retrieved from: https://www.lifestyleasia.com/sg/style/fashion/luxury-fashion-and-esports-gamers/

video located in Paris, the world center of fashion. The music video featured digital versions of those 5 artists wearing the digital clothings which the League of Legends skins are wearing. The music video called Giants was released on Youtube, promoting League of Legends and Louis Vuitton and linking the Louis Vuittons web shop in the description. The song was performed live in the League of Legends World Championship in Paris where the artists were wearing the clothing featured in Louis Vuitton's web shop.[89]

6.3.3 The Result

The collaboration proved to be lucrative for both parties as the agendas of the companies participating in the collaboration were satisfied. League of Legends increased their popularity by having yet another globally popular original musical performance in the opening ceremonies of the World Championship. The music video which was created as a part of the collaboration reached 110 millions of views on youtube meaning hundreds of millions of gamers saw their favorite characters wear luxury clothing designed by Louis Voitton as well as introducing gamers to a now gamer friendly brand of Louis Voitton. The League of Legend World Championship ceremony was viewed by more than 40 million unique viewers which is how many users saw the artists wearing new luxury gaming clothing on the live stream. Most importantly, this massive promotion was immediately monetized through micro-transactions in League of Legends by selling the new digital clothing on champions in the video game. The revenue generated from those sales was enormous but the numbers aren't public due to Riot games being owned by the Chinese conglomerate Tencent. Finally, Louis Vuitton achieved what they were attempting to achieve which is penetrating into the gaming industry market. Making gamers their potential customers which is certainly what was achieved since even gamers outside of the League of Legends Esports were informed about the luxury clothing brand and some even clicked on the various web shop links. [90]

6.4 Case study on Loot Boxes

A product purchasable only in video games, called also a loot prize/crate/chest is a digital product that can be used to obtain random items from a list of possible loot box rewards such as different appearances of playable characters or even in-game items used for playing such as weapons and tools according to chances which are displayed before purchasing a loot box. Currently, game

[89] Webster A. 2020, Louis Vuitton is designing new skins for League of Legends. Retrieved from: https://www.theverge.com/2019/9/23/20875541/louis-vuitton-league-of-legends-skins-summoners-cup-case
[90] Favis E. 2020, League of Legends hero Senna gets a Louis Vuitton makeover. Retrieved from: https://www.washingtonpost.com/video-games/2020/02/06/league-legends-hero-senna-gets-louis-vuitton-makeover/

developers are using loot boxes as a form of microtransactions to cover the costs of running the game while also making revenues selling them. These products are entirely digital with no physical counterpart and offer the opportunity to the users to easily obtain rare in-game items, some of which are worth thousands of dollars on reselling websites. Average loot box costs range from 1 dollar to 5 dollars and some include probability ratios of less than 1% to obtaining rare items with 99% of the items being common with no value. Many psychology experts consider this gambling, but the customers of these loot boxes are underaged and unaware of the practices. [91]

6.4.1. The problem

Video game providers are producing video games into highly competitive markets consisting of PC,console and most of the most profitable market mobile phone games. In those markets, digital products have already established successful monetization models such as the Freemium model from Candy crush saga, microtransactions model in games such as League of Legends and premium models in PC titles like Diablo 3. Having to compete with such developed digital business models, companies have been seeking ways of improving the existing monetization models so they could compete with the industry giants. Companies like Activision- Blizzard, EA Sports, Epic Games were developing promising titles in 2016 and needed the improved monetization models to make a return on their investment and keep the online service of these games running despite immense costs.

6.4.2. The solution

Activision- Blizzard, EA Sports and Epic games implemented a new popular method of improved microtransactions called loot boxes. These loot boxes contained various items across the titles of these games such as rare football players, rare weapons and rare characters. This new microtransactions model made the games entirely free to play across all platforms and limited no gameplay options. The microtransactions were generally enforced with speeding up progress and cosmetics. The innovation these companies made is not allowing players to directly purchase cosmetical or progressive items, but instead hide them behind a percentage chance of a digital item box. In other words, an user that spends a thousand dollars on loot boxes is not guaranteed that one item the user desires and has no other way of obtaining it. This coupled with limited selling tactics, tactics which offer snow items during Christmas time only and such limited

[91] Drummond, A., Sauer, J.D. 2018, Video game loot boxes are psychologically akin to gambling. Nat Hum Behav 2, 530–532. https://doi.org/10.1038/s41562-018-0360-1

seasonal items, created a lot of pressure for the users to make purchases or not be able to ever obtain those items. Imagine going to the store, wanting to buy a product in a store but instead of getting the option to buy a product for a full price, the customer must buy chances at winning the product. The mentioned companies implemented digital currencies such as Vbucks (Fortnite, Epic Games), Credits (Overwatch, Activision-Blizzard) and FUT coins (FIFA, EA Sports). These currencies were used to bypass gambling laws by making it seem that the customer is spending money on an in-game currency rather than a chance of obtaining something rare. [92]These implementations made them more competitive in the video games industry market and more companies started following this method of monetization.

6.4.3. The result

Loot boxes have been a massive success in the microtransaction models to the extent that Governing agencies needed to issue laws against the unfair use of loot boxes in monetization models in order to protect the users from predatory practices. From a business perspective the loot boxes reached revenues of 30 billion dollars from companies which implemented them in 2017. This made companies with similar monetization models fully implement them in order to ride the wave of their success while it lasts. Such companies include Riot games (League of Legends), Supercell (Clash Royale), Respawn Entertainment (Apex Legends) and many more. The loot box market was projected to reach 50 billion dollars of revenue in 2020 but these projections were altered due to the intervention of governing bodies. From a public relations perspective, companies that implemented loot boxes gained a negative backlash from their communities as such practices were exploiting individuals with gambling tendencies (Whales) which could not rationally spend on such types of products. The European Union has defined strict guidelines to loot boxes where loot boxes must have a guaranteed reward from purchasing them. For example a loot box with a 1% chance of opening a rare item must give that item to the player after 100 attempts, giving the exact monetary value of a product. China has restricted the number of loot boxes a citizen can open per day, whie Belgium has made loot boxes and surprise mechanics an illegal practice and banned them from commercial use. [93]

[92] King D. L. , Delfabbro H. P. 2019, a Blueprint for Practical Social Responsibility Measures. Int J Ment Health Addiction 17, 166–179. https://doi.org/10.1007/s11469-018-0009-3

[93] Zendle D. , Meyer R. , Over H. 2019, Adolescents and loot boxes: links with problem gambling and motivations for purchase. Retrieved from: https://royalsocietypublishing.org/doi/10.1098/rsos.190049

6.5 Analysis of the results from the case studies

The main connecting point among the three case studies is the form in which they are provided which is the form of digital products and services. According to the classification of digital products, the first case study is classified as a digital service where the digital technologies are used to create a platform and offer live streaming services to the customers. The second product and third product are classified as pure digital products since they do not have any physical counterparts to be classified as converted digital products. Another common denominator to these three case studies is that all the digital products mentioned generated high revenue within the gaming industry, some through the use of Esports as a promotion tool and some through the use of advanced monetization methods. Each of the companies mentioned in the case study run their own monetization models for digital products. Amazon's Twitch uses a variety of subscription options such as Amazon prime and Amazon Turbo that offer additional options to paying users such as skipping ads, communicating with content creators and unique emojis. Another form of monetization which is capitalized on free users is the displaying of ads. Like in the Advertisements monetization model , Twitch users can watch ads in order to spectate live broadcasts for free. The monetization model is a hybrid of freemium (free users do not have access to all options), Advertisements model (Free users watch ads) and subscription model (users pay a monthly fee). The use of Esports is heavily utilized on Twitch as it was shown to be the most popular Esports platform. The Louis Vuitton case study shows how a luxury fashion brand utilized digital technologies to penetrate the gaming market in which its competitors have already been participating. The monetization model was a pure microtransactions model where users were paying money for the LV designer skins ingame. However, this was not the main goal of the company, the company used it as a method of promoting the brand to a new audience of gamers on a massive world championship stage with hundreds of millions of live spectators. Moving on, the third case study on loot boxes explained how companies used an updated microtransactions model and achieved massive success. The model made the user purchase digital currencies within the game that would later be spent on products with probability values associated with them. All three products exist in the same gaming industry and are a part of the same gaming ecosystem. Twitch !DROP can give spectating subscribed users loot boxes called loot chests in League of Legends. The users have a chance to obtain the exclusive LV designer skins from those loot boxes demonstrating that all the digital products in these case studies are a part of the same digital ecosystem.

7. CONCLUSION

From analysing digital technologies and the products that have occurred as a result of such technologies, it is evident that digital products are more advanced, flexible and versatile than traditional products. The gaming industry has been an industry filled with digital products where the only limitations lie in the technologies used. Considering the increasing number of video game users, it is no wonder that many of them opted to watch the best players compete in a new Esports industry. The industry which utilized basic technologies such as mobile, cloud computing and game servers to provide the spectators with spectating options not available in traditional sports. With the massive growth of Esports and the gaming industry during the Covid-19 pandemic, many controversial topics such as the comparison to traditional sports have occured. Excluding the physical activity component, Esports fit the sports definition perfectly with universities offering E-sport scholarships paired with regular sport scholarships. Digital products have shown to be a developing concept in the business economy where regulatory bodies have still not defined consumer protection laws to prevent consumer exploitation from various types of digital products. To conclude, emerging digital technologies, especially virtual reality technologies are the future of the gaming industry since the immersive experience will change gaming and Esports.

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