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Faculty of Mass Media Communication

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Theory
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Journal Orientation

Acta Ludologica is a scientific journal in the field of digital games. The journal contains professional scientific reflections on digital games; it also offers academic discourses on games, especially media and digital competencies, creation, design, marketing, research, development, psychology, sociology, history and the future of digital games and game studies.

Acta Ludologica is a double-blind peer reviewed journal published twice a year. It focuses on theoretical studies, theoretical and empirical studies, research results and their implementation into practice, as well as professional publication reviews.

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Editorial

Slovakia on the Game Studies' Map

Slovakia has never been very affable to everything about digital games. The reason lies in rooted prejudices which regard games at the level of children's toys, as non-productive leisure time, the consequences of which remain even today. The historical background played a significant role in this deepening abyss separating the development of the digital-gaming sector in the world and in Slovakia. As a socialistic country, we involuntarily stayed behind. The first 'western' gaming devices, including some computers brands like Apple, could only officially enter Slovakia (then Czehoslovakia) after 1989 and and the period thereafter was in the spirit of various fake consoles, which flooded our market, copying and substituting (for us) the expensive originals. Eight years later, Slovakia made its first game export – Spellcross.

However, the last few years indicate a change. The abyss considerably decreases, new game development studios are appearing, and the digital-game sector is slowly acquiring seriousness and value as generally perceived by the rest of the world. This is also related to the gradual establishment of gaming studies at the academic level, which have already found their place in the surrounding countries (e.g. the Czech Republic, Poland), and now even in Slovakia, culminating at the start of 2018 by the establishment of the scientific journal Acta Ludologica, focusing on both games and digital games discourses.

Not only for the abovementioned reasons, the content of Acta Ludologica's presented issue is particularly dedicated to the studies of scholars and researchers of the Faculty of Mass Media Communication at the University of Ss. Cyril and Methodius in Trnava, a residence of the only study program focusing on game discourse (Theory of digital games) so far in Slovakia, in order to demonstrate the potential within the general development of game studies on academic grounds, originating from our region. The acquisition is represented by a wide range of topics applied to various contexts.

The marketing point of view is investigated by Jana Radošinská with her analysis of portraying historical landmarks and events through the famous digital games' series Assassin's Creed, and my own attempt to apply the concept of timelessness to advergames released within the history of the digital-gaming industry. The following theoretical study by Tomáš Farkaš determines the importance of binaural and ambisonic sound for the future of digital games, and an overview study by Ivan Rokošný brings the summary of the most important milestones in digital games' history up to present. A deeper insight into the state of the gaming sector in Slovakia, from the digital games' museology point of view, is subsequently provided by an interview with Maroš Brojo.

Besides following critical reviews of the latest publications and a summary of interesting news from games discourse, for the first time, the issue is concluded by a new section – Add-ons – consisting of short-ranged scientific, philosophical and artistic reflections on phenomenona of the comprehensive game world.

As the new Acta Ludologica's editor-in-chief, it is now my long-term quest, along with dealing with journal content relevancy, to mediate another platform and opportunity for game researchers and scholars, without limitation to our region, to publish studies which could represent benefits for the future development of games studies in general.

Zdenko Mago
Acta Ludologica's Editor-in-Chief

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Portraying Historical Landmarks and Events in the Digital Game Series Assassin's Creed

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Jana Radošinská is a media theorist and a lecturer. She specialises in issues of media culture, media industry, mainstream film production and media entertainment. Her scholarly interests also include problems related to contemporary media audiences, cultural aspects of journalism, television studies and digital games. She is the co-author of the scientific monograph Aktuálne trendy v mediálnej kultúre (Contemporary Trends in Media Culture, published in 2013) and the author of the scientific monograph Mediálna zábava v 21. storočí: Sociálno-kultúrne aspekty a trendy (Media Entertainment: Socio-Cultural Aspects and Trends, published in 2016). She is Deputy Managing Editor of the renowned academic journal Communication Today.

ABSTRACT:

Most young people living in the world of today do not express much interest in history and historical landmarks. It is therefore quite surprising that specific digital games portraying various historical periods or their alternative, partly fictitious versions might at least raise their players' awareness of real historical facts and sites. Some of these games have been able to achieve global popularity. The author uses the digital game series *Assassin's Creed* (2007 – present day) as an example of a digital gaming environment which features historical fiction merged with real historical events and figures. The aim of the study is to better understand the ways *Assassin's Creed* portrays historical landmarks all over the world and bring them closer to the players. The basic assumption is that at least some of the players, here seen as potential "gamers-tourists", may be interested in finding out more about the depicted historical sites and their true counterparts. Given the aforementioned assumption, our ambition is to discuss the digital game series *Assassin's Creed* and its tendency to offer visually attractive virtual re-creations of real historical sites, reflecting on the series' presumed ability to depict historical landmarks, figures and events in mostly fictitious, but still interesting and eye-catching ways.

KEY WORDS:

Assassin's Creed series, gamer-tourist, gaming environments, historical accuracy of digital games, historical landmarks, hyper-realistic game renditions.

Introduction

At present, it is very difficult to raise teenagers and young adults' (generally low) awareness of historical events and landmarks. Although these events or sites have been parts of human spiritual and material riches for centuries, some of them even for millennia, young people's disinterest in historical facts and monuments is still quite obvious. We therefore have to seek 'alternative' or rather late-modern methods of displaying their remarkable features and stressing their importance. It is worth noting that various digital games have proven to be quite effective and useful tools of this much needed popularisation. While discussing new trends in marketing communication related to digital games, Z. Mago remarks that the mobile digital game *Pokémon GO* offers various opportunities for tourism and destination marketing. The ways the game utilises location-based services have even inspired its fans to create several travel itineraries and sightseeing tours linked to Pokémon hunting. As the author further remarks, these fans have made many sites with Pokémon location maps and also mobile applications (e.g. *Poké Radar*, *Gochat*). Moreover, 'official' organisations (such as travel agencies) do not underestimate the potential of *Pokémon GO* for tourism development either; some of them have started to offer 'Pokémon tours' (e.g. *Junior Travel* in Spain).[1]

One of the most popular digital game products that possesses the potential to increase young people's awareness of history (as well as their knowledge on architectonic styles used in various countries or historical eras, on their transformations and

1 MAGO, Z.: New Trends of Marketing Communication Based on Digital Games. In *European Journal of Science and Theology*, 2017, Vol. 13, No. 5, p. 178.

differences) is the digital game series *Assassin's Creed.* In the *Assassin's Creed* digital game series, players are given a chance to explore many different heritage environments, e.g. the Holy Land during the Third Crusade, Renaissance Italy, the Ottoman Empire, America during the War of Independence and Seven Years War, the Golden Age of Piracy in the Caribbean, Paris during the French Revolution, Victorian Era London[2] and, most recently, Ancient Egypt near the end of the Ptolemaic period. Developed by the French digital game publisher *Ubisoft*, *Assassin's Creed* can be characterised as a multiplatform game franchise consisting of ten major digital games which are loosely based on the Slovenian novel *Alamut* by Vladimir Bartol, the history of the Knights Templar and older digital games featuring the Prince of Persia. Different games in the series are set in different locations and historical periods.[3] The historical framework of the given digital game series is also acknowledged by its producers and creators. One of them, Michael Beadle, underlines this fact repeatedly: *"History is a core component of the Assassin's Creed franchise,"* he says, *"and one that we know has taught millions of players over the years about key characters and historical events by experiencing pivotal moments in history".*[4] The *Assassin's Creed* series has therefore become more explicit in its claims to historical accuracy. And yet, as E. Herbst Buzay and E. Buzay state, the very basic history presented in the games is false, not only in terms of the physicality of the locations but also in relation to the biographies of real historical figures included in the games.[5] Nevertheless, ordinary players – especially younger ones – are mostly unaware of the numerous differences between real historical events and the events of the game; at least they might not spot these differences immediately. Of course, this fact may increase the games' 'realistic' aspirations, but it also poses various uncertainties and potential problems associated with perceiving fictitious historical events as real.

On the other hand, we have to mention one of *Assassin's Creed's* important in-game features – the on-screen 'guides' of historical places. These guides, as M. Salmond and J. Salmond observe, are written much like a tourist guide book would be. The specific log entries typically include information on important characters from the virtual world of the game (some of them are real historical personas, e.g. Leonardo da Vinci or George Washington) and their personal history. What is more important to us, however, is that many entries related to the historical context and true backstory for historical landmarks or buildings situated within the game are also available. In other words, when players encounter a location of historical importance, the built-in game mechanics allows them to see textual information on the landmark's history and cultural significance. The game thus performs the role of a tour guide, providing the "gamer-tourist" with additional historical and contextual information. This feature seems to enrich the gaming experience and the players' understanding of a specific location. As the main focus of the game series is action, the players might decide to completely ignore these 'tourist guides'. However, they are also free to explore the city or landscape further; they can wander around like gamers-tourists. The characters populating this in-game 'world' are, for the most part, accurately dressed and the cities carefully mapped from original plans, sketches and historical records.[6] Other authors express similar opinions – according to C. Veugen, the *Assassin's Creed* series uses hyper-realistic renditions of locations to 're-create' historical sites on the basis of archaeological evidence, aiming to create visually compelling architectural escape routes for the games' main characters.[7]

The narrative format of *Assassin's Creed* is also interesting. As noted by D. N. Dow, the story encourages its players to interact with the game's environments in an imaginative and interpretive way. Structured as 'a game within a game', the events taking place during the game are, in fact, a virtual reality constructed in the mind of a man named Desmond who lives in present-day America. This virtual reality is based on the memories of Desmond's long dead ancestors[8] living in different historical periods and all over the world.

Goals and Methods of the Analysis

The article's main objective is to reflect on the digital game series *Assassin's Creed* and its ability to offer visually attractive virtual re-creations of real historical landmarks and sites. We work with the basic assumption that such spectacular computer-generated imagery may raise or strengthen the players' interest in (and awareness of) real historical events and buildings of great historical significance.

The previous theoretical overview on the topic aimed to point out that most young people are (generally) not interested in history and historical buildings or architectonic styles; unless they experience them in an original and visually compelling way. We also wanted to offer a complex set of theoretical outlines on the digital game series *Assassin's Creed* and note that it may function as a 'tourist guide'; it involves many landmarks and buildings of huge historical importance which the players can see and explore; they can get to know them better.

The following chapter allows us to use logical methods of thinking (analysis, synthesis, comparison and specification) to analyse the ways individual games of the *Assassin's Creed* series portray historical landmarks within their narratives. Its ambition is to reflect on the development of the *Assassin's Creed* series in terms of re-creating significant historical buildings and landmarks to make the in-game environments more interesting and visually rich. As we are interested in uncovering the ways the games in question portray historical sites, events or figures, we employ the basic principles of qualitative content analysis; more specifically, elements of narrative and discourse analysis are applied in order to find out more about how the individual instalments belonging to the given game series depict and utilise the spectacular in-game renditions of historical sites.

2 CHAPMAN, A.: *Digital Games as History: How Videogames Represent the Past and Offer Access to Historical Practice*. New York : Routledge, 2016, p. 179.

3 KERR, A.: *Global Games: Production, Circulation and Policy in the Networked Era*. New York : Routledge, 2017, p. 142-143.

4 STARKEY, D.: *Department of Education Believes Video Games Are the Future of Learning*. Released on 15th April 2015. [online]. [2018-02-11]. Available at: <https://www.gamespot.com/articles/department-of-education-believes-video-games-are-t/1100-6426600/>.

5 For more information, see: HERBST BUZAY, E., BUZAY, E.: Neomedievalism and the Epic in Assassin's Creed. In YOUNG, H. (ed.): *The Middle Ages in Popular Culture: Medievalism and Genre – Student Edition*. New York: Cambria Press, 2015, p. 113-129.

6 SALMOND, M., SALMOND, J.: The Gamer as a Tourist. In LONG, P., MORPETH, N. D. (eds.): *Tourism and the Creative Industries: Theories, Policies and Practice.* Abingdon : Routledge, 2016, p. 158.

7 VEUGEN, C.: Computer Games as a Comparative Medium: A Few Cautionary Remarks. In FROMME, J., UNGER, A. (eds.): *Computer Games and New Media Cultures: A Handbook of Digital Games Studies*. Dordrecht : Springer, 2012, p. 53.

8 DOW, D. N.: Historical Veneers: Anachronism, Simulation, and Art History in Assassin's Creed II. In KAPELL, M. W., ELLIOTT, A. B. R. (eds.): *Playing with the Past: Digital Games and the Simulation of History.* New York : Bloomsbury, 2013, p. 227.

Portrayals of Historical Landmarks in the Assassin's Creed Series

Following the previous parts of the text, let us focus on the most significant and interesting historical sites, landscapes and buildings featured in the digital game series *Assassin's Creed*. Careful readers will note that numerous smaller expansions and downloadable contents are not included – we mention only the ten major digital games from the series. The original *Assassin's Creed*[9] takes place during the Third Crusade and thus features a lot of religious landmarks; most of them are situated in the sacred city of Jerusalem. We would like to mention, for example, the Temple Mount and the Dome of the Rock, a gold-topped mosque and major landmark in Jerusalem (for the Dome's in-game portrayal, see Picture 1). The Temple Mount is the third holiest site in the world for Muslims (after Mecca and Medina). In Muslim tradition, this is where Prophet Mohammed made his 'Night Journey' to the throne of God. The Dome of the Rock was built upon it in the seventh century, when Muslims conquered Jerusalem. Moreover, parts of the four walls surrounding the Temple Mount and the Dome of the Rock are the holiest site for Jewish believers and the landmark is very important for Christians, too.[10] The game's creators seemed to quickly understand that the symbolic or rather virtual exploration of historical sites was one of the most compelling features of the given game. In this particular case, some of the portrayed historical landmarks are hard, dangerous or even impossible to visit in real life – mostly due to unstable political and religious situation in today's Israel.

Picture 1: In-game footage of the Dome of the Rock in Jerusalem, Assassin's Creed (2007)
Source: Dome of the Rock. [online]. [2018-02-22]. Available at: <http://assassinscreed.wikia.com/wiki/Dome_of_the_Rock>.

Assassin's Creed II[11] and *Assassin's Creed Brotherhood*,[12] the second and third major games in the *Assassin's Creed* series, are set in Renaissance Italy. The amount of visualised historical landmarks is quite overwhelming, much higher than in case of the first game.

9 UBISOFT ENTERTAINMENT: *Assassin's Creed + Assassin's Creed 2. Special Collection.* [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2010.
10 *Visiting the Temple Mount and Dome of the Rock*. [online]. [2018-02-11]. Available at: <https://www.touristisrael.com/temple-mount/15944/>.
11 UBISOFT ENTERTAINMENT: *Assassin's Creed + Assassin's Creed 2. Special Collection*. [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2010.
12 UBISOFT ENTERTAINMENT: *Assassin's Creed: Brotherhood.* [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2011.

It is also believed that this feature, among others, strengthens the enormous popularity of these particular games, which is unmatched by any of the newer and visually superior sequels. One of the most interesting historical landmarks included in the games in question is the Cathedral of Saint Mary of the Flower, the main church in Florence, Italy (see Picture 2 for its in-game visualisation). Dominating the Florence skyline, the Cathedral's magnificent dome is considered to be one of the most important architectural achievements of the Italian Renaissance. Inside the Cathedral, there are stained-glass windows and frescoes painted by Italian masters, and one of the oldest examples of a 'hora italica' clock in the world.[13] The players are able to explore the site quite thoroughly, solving various riddles and puzzles.

Picture 2: Visualisation of the Cathedral of Saint Mary of the Flowers in Florence, Assassin's Creed II (2009)
Source: Basilica di Santa Maria del Fiore. [online]. [2018-02-22]. Available at: <http://assassinscreed.wikia.com/wiki/Basilica_di_Santa_Maria_del_Fiore?file=Basilica_di_Santa_Maria_del_Fiore_Panorama.png>.

Assassin's Creed Revelations[14] rediscovers both previous protagonists: Altaïr Ibn-La'Ahad in 12th and 13th century Masyaf and Ezio Auditore da Firenze in 16th century Constantinople. The in-game environment is therefore considerably different. The players are offered a chance to encounter various historical landmarks of the Ottoman Empire, which are, once again, quite exotic and relatively unknown, at least in relation to younger members of the Western digital games audiences. Probably the most important of them is the Hagia Sophia (see Picture 3 for the building's in-game re-creation), otherwise known as the Church of Holy Wisdom, the former Eastern-Orthodox Christian basilica located in Constantinople. Being one of the most significant monuments not only in Turkey but on Earth, the Hagia Sophia church had been the centre of Orthodox Christianity until 1453 when the city was conquered by Ottomans. It quickly became a jewel for the Muslim world and the grand mosque of the sultans. It is now the national museum of Turkey.[15] The romantic landmark also plays an important role in relation to one of the *Assassin's Creed*'s most popular and rather untraditional love stories – the aging Assassin Ezio Auditore looks for a florist to obtain white tulips, a gift meant for Sofia Sartor, a much younger, sophisticated Venetian bookstore owner who will eventually become his wife. The quest ends up with Ezio finding the flowers in Hagia Sophia's courtyard and him and Sophia enjoying a picnic in the shadow of the great mosque.

13 *Cathedral of Santa Maria del Fiore (Duomo)*. [online]. [2018-02-11]. Available at: <https://www.expedia.com/Cathedral-Of-Saint-Mary-Of-The-Flower-Duomo.d501046.Vacation-Attraction>.
14 UBISOFT ENTERTAINMENT: *Assassin's Creed: Revelations*. [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2011.
15 *Hagia Sophia Info*. [online]. [2018-02-11]. Available at: <http://www.hagiasophia.com/listingview.php?listingID=18>.

Picture 3: Comparison of the real Hagia Sophia and its representation in Assassin's Creed Revelations (2011)
Source: Hagia Sophia. [online]. [2018-02-22]. Available at: <http://assassinscreed.wikia.com/wiki/Hagia_Sophia?file=800px-Hagia_Sophia.png>.

Assassin's Creed III[16] was the developers' attempt to popularise the franchise amongst North American gaming audiences. That is why the story is set at the time of the American Revolutionary War. However, the number of historical landmarks is notably lower than in the previous games. One the historical sites worth mentioning is St. Paul's Chapel, the Episcopal church located in Lower Manhattan, the longest serving public building in New York (more than 250 years of continuous service). It is still home to an active worshipping community, hosts a wide variety of events and welcomes more than one million visitors every year. It first opened in 1766; a decade later, the Great Fire of 1776 destroyed the first Trinity Church nearby, but St. Paul's survived, thanks to a bucket brigade dousing the building with water. Many, including the first American President George Washington, made St. Paul's their religious home until the second Trinity Church was rebuilt.[17] The site is therefore an important part of American history (as well as the portrayed era as a whole). However, the game's obvious fixation on the life of Native Americans and huge open spaces of the (then almost untouched) North American wilderness excludes the possibility of thoroughly exploring urban landmarks and interesting sites built by European immigrants.

Portraying the Golden Era of Piracy in the Caribbean, *Assassin's Creed IV: Black* Flag[18] includes various areas of the Caribbean, including Jamaica and Cuba. The most significant landmark the game involves is the Cathedral of Havana, i.e. the Cathedral of the Virgin Mary of the Immaculate Conception in Cuba. The Cathedral of Havana was built on the site of an earlier smaller church; construction began in 1748 and was finished many years later, in 1777. The Cathedral was built in a Baroque style, featuring many curves and double curves. The building's obvious asymmetry and curious construction material – coral taken from the ocean – make it one of the most unique houses of worship in the world. Fossils of marine flora and fauna can still be seen in the stone of the Cathedral.[19] Despite the fact that the site would not have existed during the events of *Assassin's Creed IV,* the building is featured in the game due to its status of an easily recognisable local landmark (see Picture 4). As substantial parts of the narrative take place at sea, aboard a pirate ship or on one of many Caribbean islands, the developers have once again decided to prefer action over site exploration.

16 UBISOFT ENTERTAINMENT: *Assassin's Creed III*. [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2012.
17 *Trinity Church Wall Street*. [online]. [2018-02-11]. Available at: <https://www.trinitywallstreet.org/about/stpaulschapel>.
18 UBISOFT ENTERTAINMENT: *Assassin's Creed IV: Black Flag. Skull Edition.* [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2013.
19 *Havana Cathedral*. [online]. [2018-02-11]. Available at: <http://www.sacred-destinations.com/cuba/havana-cathedral>.

Picture 4: Cathedral of Havana in Assassin's Creed IV: Black Flag (2013)
Source: Cathedral of Havana. [online]. [2018-02-22]. Available at: <http://assassinscreed.wikia.com/wiki/Cathedral_of_Havana?file=Cathedral_of_Havana.jpg>.

Assassin's Creed Rogue[20] features the Seven Years War era in the mid-18th century. The game's visualisation of famous historical sites is rather modest – however, there are a few, among them Mount Vernon, which is most famous for being the home of the Washington family. George Washington's beloved Mount Vernon began as a one and one-half story house built in 1735 by his father, Augustine, and received its well-known name during the ownership of his half-brother Lawrence. George acquired Mount Vernon in 1754 and personally supervised each renovation, advising on design, construction and decoration – even during the Revolutionary War.[21] This historical site underlines the importance of George Washington's persona in terms of the *Assassin's Creed* series.

Assassin's Creed Unity[22] starts on the eve of the French Revolution in 1789 and extends up to the Thermidorian Reaction in 1794. The events therefore take place in revolutionary Paris and its districts, palaces and overcrowded streets. Among the most significant historical sites the player gets to visit is the Palace of Versailles, once the royal residence of the King of France, one of the largest palaces in the world. The Palace is widely considered an architectural and aesthetic masterpiece, one of the greatest achievements in French 17th century art. Louis XIII's old hunting pavilion was transformed and extended by his son, Louis XIV, when he installed the Court and government there in 1682. A succession of kings continued to expand and renovate the Palace up until the French Revolution.[23] The players are able to experience the Palace's beauty and monumentality (the in-game version can be seen in Picture 5) through the eyes of a young boy Arno, the future Assassin, who accompanies his father during a meeting of the Assassins inside the Palace. Much later, Arno, now grown-up, recently exiled from the Assassin Order and rejected by a young woman he loves, returns to Versailles, ends up in a local tavern and engages in a brawl. His precious watch, an important part of his heritage, is stolen right after the fight and he has to explore the Palace once again to find it. Some of the game's most important scenes therefore happen inside the Palace – at first young Arno witnesses his father's murder and later he tries to find the thieves possessing his heritage watch.

20 UBISOFT ENTERTAINMENT: *Assassin's Creed: Rogue*. [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2014.
21 *The Mansion of George Washington's Mount Vernon Is One of the Most Iconic 18th-Century Homes in America*. [online]. [2018-02-11]. Available at: <www.mountvernon.org/the-estate-gardens/the-mansion/>.
22 UBISOFT ENTERTAINMENT: *Assassin's Creed: Unity. Bastille Edition.* [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2014.
23 *The Palace: From the Seat of Power to a Museum of the History of France*. [online]. [2018-02-11]. Available at: <http://en.chateauversailles.fr/discover/estate/palace>.

Picture 5: Young Arno and his father at the Palace of Versailles, Assassin's Creed Unity (2014)
Source: Palace of Versailles. [online]. [2018-02-22]. Available at: <http://assassinscreed.wikia.com/wiki/Palace_of_Versailles>.

Set in Victorian era London and introducing twins Evie and Jacob Frye as two equally important lead protagonists, *Assassins Creed Syndicate*[24] builds upon the general mainstream popularity of the end of the Second Industrial Revolution. It is therefore understandable that the game situates one of the most ixymportant missions into Her Majesty's Royal Palace and Fortress, more commonly known as the Tower of London, the world-famous historical castle. The Tower of London was built by William the Conqueror towards the end of 1066 (the White Tower was built later, in 1078). The White Tower lies at the Fortress's centre; it was originally conceived as a residence for royalty, but has served a host of other functions throughout history, most prominently that of a prison. However, over the centuries the Tower of London has been used as a royal residence, an armoury, a treasury, a zoo, the Royal Mint, a records office and to house the Crown Jewels as well.[25] Evie Frye infiltrates the Tower to locate the Shroud of Eden, an artefact of ultimate value; however, she finds out that the place has been overtaken by Templars disguised as Royal Guardsmen. The quest involves rescuing the Tower's true warden and killing Lucy Thorne, a prominent Templar. It is therefore one of the most important missions in the game and the players are able to explore even the Tower's hidden places and dark corners. However, in this case they do so not to admire the Tower's particularities, at least not primarily, but rather to experience spectacular action sequences.

Assassin's Creed Origins[26] focuses on the Ptolemaic Kingdom and the widely popular persona of Queen Cleopatra (undoubtedly she is so popular thanks to being famously portrayed by Elizabeth Taylor in the Hollywood movie from the 1950s). Besides pyramids, the most interesting historical landmark included in the game is the Library of Alexandria, one of the largest and most significant libraries of the ancient world. First built by Ptolemy I and finished under Ptolemy II, it was dedicated to the Muses, the nine goddesses of the arts and daughters of Zeus. Historically, the library was partially destroyed during the Caesar's Siege of Alexandria.[27] However, in the game, the Library suffers no damage whatsoever and after the events of the Siege, it remains the same as before. Of course, its digital portrayal is widely based on speculations of the game's developers, as the library's exact shape, extent and decorations are unknown even to historians. One of the game's most remarkable features is its 'Discovery Tour Mode'. It seems that the series' developers try to 'return to their roots' by offering the players an exploration-based gaming mode that allows them *"to explore ancient Egypt without being interrupted by combat or quests. Purely educational, the mode is a 'virtual museum' without threats but instead with guided tours and historical sites to discover".*[28] In other words, the players who use this mode are – at least at the given time – mostly interested in exploration, not in fulfilling quests or engaging in combat situations. Considering the fact that this game is, quite naturally, visually superior to the previous instalments rich in hyper-realistic renditions of historical landmarks, its gaming environment bound to depictions of historical sites is even more immersive.

24 UBISOFT ENTERTAINMENT: *Assassin's Creed: Syndicate. Special Edition*. [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2015.
25 CAMPBELL, S.: *Everything You Need to Know about Visiting the Tower of London*. Released on 4th September 2017. [online]. [2018-02-11]. Available at: <http://www.telegraph.co.uk/travel/destinations/europe/united-kingdom/england/london/articles/tower-of-london-visitor-guide-prices-tickets-advice/>.
26 UBISOFT ENTERTAINMENT: *Assassin's Creed: Origins*. [digital game]. Montreuil Suis Bois : Ubisoft Entertainment, 2017.
27 *The Destruction of the Great Library of Alexandria*. Released on 12th May 2014. [online]. [2018-02-11]. Available at: <http://www.ancient-origins.net/ancient-places-africa-history-important-events/destruction-great-library-alexandria-001644>.

Conclusion

Assassin's Creed is one of the few globally popular mainstream digital games series that place prominent emphasis on the exploration of historical landmarks and monuments. The previous analysis shows that the series creatively develops the 'tourist guide book' game mechanics mostly in its earlier instalments. It is worth noting that these games are also the most popular parts of the series, the ones which underline the importance of exploring European and oriental monuments. However, the latest releases are based on much more advanced visual effects and graphic elements – and those set in North America as well – tend to prefer spectacular action over the once careful, aesthetically rich exploration. On the other hand, *Assassin's Creed: Origins* (or rather its Discovery Tour Mode) is, as it seems, an exception. This may even indicate that the game series' developers try to explore new possibilities for utilising the 'tourist guide book' game mechanics. Nevertheless, the ways of presenting specific historical monuments have changed – from the sheer exoticism and mysticism of the ancient religious sites of the Holy Land, through the most beautiful buildings of the Italian Renaissance filled with clues, puzzles and visually compelling escape routes, romanticised portrayals of oriental monuments, some of the most important buildings related to American culture and national identity, to the most popular places to see when one visits European metropoles such as Paris or London.

The positive aspects of including historical landmarks in the games' storylines are related to offering the players visually attractive renditions of (partly fictionalised) history and architecture. At least some of them may start to express more interest in real historical facts and sites or in differences between the buildings, events and people portrayed in the games and their real counterparts. Given the fact that various Italian tourism entrepreneurs offer 'Assassin's Creed tours' of Florence,[29] the concept of the "gamer-tourist" certainly exists. It is a relatively new but quite prospective form of cultural tourism. Undoubtedly, the idea is interesting and intriguing enough to inspire a much wider spectrum of scholarly reflections. We may even conclude that many players all over the world who like, own and play this series – especially the younger ones – are able to 'visit' these places only virtually, as travelling around the globe and visiting some of these monuments (such

28 *Discovery Tour Mode of Assassins Creed: Origins*. [online]. [2018-10-05]. Available at: <https://support.ubi.com/en-GB/Faqs/000031846/Discovery-Tour-Mode-of-Assassin-s-Creed-Origins-ACO>.
29 Remark by the author: This kind of tourist service is also offered by the prestigious Four Seasons hotel in Florence. It is notable that the service is categorised as a 'family activity'.; See, for example: *Family Activities.* [online]. [2018-02-11]. Available at: <https://www.fourseasons.com/florence/services_and_amenities/family_at_four_seasons/family_activities/>.

as the Dome of the Rock) is not only expensive and time-consuming but also potentially problematic due to ongoing political affairs, religious disparities and armed conflicts.

It seems like real historical events may serve as compelling digital game backgrounds and plot structures, particularly if many details included (such as clothing or furniture) do indeed correspond with real historical circumstances. The players are able to encounter – if not strictly realistic, at least approximate – depictions of historical buildings, architectural 'jewels', works of art. Those of them who have never expressed any interest in history and architecture may acquire, although unwittingly, a certain body of basic knowledge on them. For example, they may be able to name at least the most famous historical landmarks. Even if the in-game objects are not exactly accurate re-creations of various historical sites, they still preserve the portrayed period's architectonic style and cultural framework, which is important. The players are therefore able to imagine some material and spiritual components of the given historical era. We may also conclude that, generally speaking, for most young people it is much more interesting to play a digital game with a narrative enriched by intriguing (although partly or fully fictitious) historical plots and monuments than to look at photographs and other materials published in encyclopaedias or read highly factual textbooks related to historical science.

We might presume that the popularity of the analysed digital game series could support cultural tourism, particularly regarding its core fans, whose motivation to visit the real locations portrayed by these games (mostly the monuments of Renaissance Italy, as *Assassin's Creed II* and *Assassin's Creed Brotherhood* are still the most popular parts of the series by far) would be probably higher. However, there are several negative consequences, too. The historical events included in the *Assassin's Creed* series are often fully fictitious, inaccurate, simplified or distorted to comply with the prearranged storytelling. Due to numerous historical inaccuracies and fantastic aspects, real historical elements and fictitious stories merge; less educated or younger players may thus not be able to distinguish between facts and fiction. We also should not forget that portrayals of historically significant places and buildings (or rather their idealised versions) in late modern digital games serve entertainment purposes primarily; their ability to offer universally comprehensible educational entertainment is therefore quite questionable, easy to overlook or even deny.

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The Concept of Timelessness Applied to Advergames

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ABSTRACT:
Advergames have been appearing alongside digital games since the very beginning. Although they had been originally created as marketing tools, their gaming nature has made from them an important part of digital-gaming industry heritage. At the same time, advergames, which persisted over time, may represent significant advantages for the brands they promote. The aim of the study is an examination of advergames' timelessness based on a theoretical framework and a qualitative-quantitative content analysis of advergames released across their history up to 2000, taking into account aspects of both digital games' and advertising timelessness. Besides general popularity, archetypal character, current playability and preservation, the analysis also focuses on the advergame design and brand implementation forms.

KEY WORDS:
advergames, digital games, iconicity, history, participation, preservation, timelessness.

Introduction

Within the history of digital games,[1] there exists a group of titles, which have had a great impact on the whole development of the digital-gaming industry, and the remarkable popularity of which is not dependent of time. Based on these characteristics, we might consider them as timeless, an attribute associated for example with important artworks.

Advertising games, *advergames* or adgames are "specifically designed digital games funded by a client (an advertiser), primarily serving to reach the advertiser's marketing goal either as a standalone communication tool or as a part of an advertising campaign. Simply put, advergames are digital games which were primarily designed for promotional purposes".[2] Although, G. Marolf refers only to the interactive method of reaching online consumers, limiting so advergames to simple games, which can be downloaded from the internet or directly played through it,[3] advergames have started appearing alongside 'ordinary' digital games, even releasing on physical media, since the very beginning of the digital-gaming industry. Some of those older advergames surprisingly belong to very favourite games within the gamers' community, which attributes to them a significant collector's value. Even though they are actually ads, many of them are today still played on original platforms or through various online emulators, because of the contained challenge or just for entertainment.

As an already integrated part of the gaming sector, advergames can be actually considered as a part of the heritage of both game and popular culture as well. This fact means that just as we can think about digital games within the scope of timelessness, we can think also about advergames within the same scope. However, in this case, it would not be only their gaming importance, but also their potential long-term promotional effects,

1 Remark by the author: In the entire study, term 'digital games' (as well as the digital-gaming industry and sector) is used in the sense of general meaning, including games for all kinds of platforms.
2 MAGO, Z.: *World of Advergaming: Digitálne hry ako nástroje reklamy*. Trnava : Faculty of Mass Media Commnunication, University of Ss. Cyril and Methodius in Trnava, 2016, p. 17.
3 MAROLF, G.: *Advergaming and In-Game Advertising: An Approach to the next Generation of Advertising*. Saarbrücken : VDM Verlag Dr. Müller, 2007, p. 45-46.

persisting over time, which could represents significant marketing benefits. The aim of the study is therefore a comprehensive examination of advergames' timelessness, and possibly to identify advergames in digital-gaming history that could be considered as timeless.

Theoretical Concept of Advergames' Timelessness

Applying the timelessness concept to advergames seems to be slightly complicated. Advergames are digital games and marketing tools at the same time, therefore both game and advertising aspects potentially influencing timelessness need to be taken into account. In addition, according to E. Aarseth, "games are both object and process",[4] thus a product as well as an activity.

A timeless product is characterized by having an important place within its own sector, and its meaning, utility and value are independent of time and space. Although, its material value can gradually increase. A typical example that is used to associate with timelessness are artworks, among which we can definitively include also digital games. Regarding the activity, C. Mainemelis defines timelessness as "a complex experience associated with an intense state of consciousness in which total involvement in the task at hand results in loss of self-consciousness and loss of the sense of time", and states that some elements of a flow such as balance between skills and challenges, intrinsic task motivation, etc., are proximal contextual conditions of timelessness.[5] M. Csikszentmihalyi characterizes flow as the sense of presence that we experience as a unified flow of moments, while feeling in control of our actions.[6] The flow within digital games similarly represents certain equilibrium between game challenge and gamers' abilities, and players experience it when they are immersed in games and losing track of time.[7] A timeless digital game therefore could be defined as a game that represents an important milestone due to being a unique asset for the entire digital-gaming industry, the playing of which provides an experience independent of time.

Such outstanding games belong, to the most successful within the market and the most popular among players, who usually mark them as iconic. The game *iconicity* thus seems to be a relevant factor for basic consideration about digital games' timelessness, or at least as its integral part. However, the iconicity does not consist only of popularity. This concept is more comprehensive and, besides popularity, reflects also reaching the status, when a game becomes an archetype, and aspects of games' playability and their preservation (see Table 1).

The *Popularity* of digital games itself basically reflects general awareness about the game among gamers as well as the global extent of its playing, but largely depends on the subjective perception of the game by gamers, influenced by game creativity and overall likeability. Creativity of game processing can be simply described through criteria

4 AARSETH, E.: Computer Game Studies, Year One. In *Game Studies*, 2001, Vol. 1, No. 1, p. 1. [online]. [2018-05-12]. Available at: <http://gamestudies.org/0101/editorial.html>.
5 MAINEMELIS, C., DIONYSIOU, D. D.: Play, Flow, and Timelessness. In SHALLEY, C. E., HITT, M. A., ZHOU, J. (eds.): *The Oxford Handbook of Creativity, Innovation, and Entrepreneurship*. Oxford : Oxford University Press, 2015, p. 136.
6 CSIKSZENTMIHALYI, M.: Play and intrinsic rewards. In *Journal of Humanistic Psychology*, 1975, Vol. 15, No. 3, p. 43.
7 CHEN, J.: Flow in games (and everything else). In *Communications of the ACM*, 2007, Vol. 50, No. 4, p. 32.

creativity[8] – originality and novelty of the game in comparison with other already existing titles, usability and value of game attributes (multiplayer, eSport, education, etc.).

Likeability is more about the impression from the game, consisting of attributes such as game immersion, the presence of an adequate challenge, and a motivation to beat the game, thus reaching mastery of it. C. Mainemelis included immersion and mastery to dimensions to describe manifestations of timelessness.[9]

Table 1: Iconicity of digital games

Aspect	Manifestation	
Popularity	General awareness	
	Extent of playing (global)	
	Creativity	Originality, novelty
		Usability, value
	Likeability	Immersion
		Challenge
		Mastering
Becoming an archetype	Genre founding	Mechanics
		Audio-visual elements
		Narratives
	Versions, variations	
	Sequels, prequels, spin-offs	
	Remake, retake	
	Cross-/trans-media transfer	
	Participatory culture	
Playability	Original title / retro gaming	
	Remastered title	
	Emulation	Commercial
		Institutional
		Participatory
Preservation	Collecting	
	Archiving	
	Museology	

Source: own processing

When a game popularity reaches a level, that it starts to influence the games market, it might become a model, *an archetype*, giving rise to more games based on it. Besides expected sequels, spin-offs or later remakes, there may appear various versions and variations of the original game, which are trying to capitalize on its success. Cross- and trans-media transfers like movie adaptations are not exceptions as well. The game as an archetype often defines new genres or subgenres, named according to it. A typical example is a subgenre of FPS games called 'doom-like games' due to the principal

8 FICHNOVÁ, K.: *Psychology of creativity for marketing communication*. Noailles : Association Amitié Franco-Slovaque, 2013, p. 21-25.
9 MAINEMELIS, C.: When the muse takes it all: A model for the experience of timelessness in organizations. In *Academy of Management Review*, 2001, Vol. 26, No. 4, p. 554.

similarity (mechanics, audio-visual elements, etc.) to the pioneer game *Doom*.[10] Game archetypes also provide a remarkable space for gamers' participation (modding, skinning, let's play, speedrun, etc.).[11]

The next important aspect is *playability*. Numerous original versions of digital games (whether popular or not) are playable only on 'obsolete technologies', for which they were developed. J. Newman and I. Simons call such games inevitable and natural victims of the market.[12] Still functioning original platforms (mostly preserved by their owner or available as second-hand goods) are able to provide the experience with originally released games and are quite uncommon, but the demand for them has been increasing, since retro gaming came into fashion. Game companies try to partially meet market needs by developing remastered versions of their own popular games. For example, in 2017, Sony published *Crash Bandicoot N. Sane Trilogy*[13] for PS4 containing all three original Crash Bandicoot games with new graphics.

Emulation currently belongs to common practises, solving problems of obsolescence and incompatibility. Although, D. McFerran argues that emulation (including formal) might ruin digital games' preservation efforts,[14] games' creators, owners, even gamers themselves inserted a considerable emotional investment in them, thus there is a high motivation to spend their own resources (money, time, skills, etc.) to keep those games still playable and played (although, often it is particularly about popular titles). An example of commercial emulation is the backward compatibility of the Xbox One that enables playing some Xbox 360 games through the built-in emulation system. Another one is the Nintendo Classic Mini released by the Nintendo Company in November 2016. This miniaturized version of the Super Nintendo Entertainment System (SNES) is compatible with modern technologies, thus original iconic Nintendo games can be played even on HD televisions. In order for formal digital games' preservation, several organizations tend to provide also the 'institutional' emulation of games, including online (e.g. Archive.org). Unlike previously, gamers are characterised by a lack of patience, therefore they overcome the ravages of time using their very own, often 'unofficial' ways in their favourite games. For example, the portable PC version of the advergame Pepsiman with built-in automatic PS emulator can be found on the web.

At present, games' persistence over time culminates in the process of their *preservation*, considering them as an important part of cultural heritage. It takes the form of collecting and archiving games, and their accumulation for museological purposes. Advergames are digital games as well, thus they should be also worthy of preservation as a part of both pop-culture and the history of the digital-gaming industry. Here it is appropriate to note that iconic digital games actually form brands, which tend to persist over time by themselves. According to A. V. Vedpurisvar, timelessness is an element of each star brand, meaning built for eternity.[15] The development of iconic advergames is much more difficult, particularly due to limited budgets. It is rational to suppose that marketers will

10 ID SOFTWARE: *Doom*. [digital game]. New York : GT Interactive, 1993.
11 ZÁHORA, Z.: Participativní marketing v kontextu digitálních her. In BÁRTEK, T., BUČEK, D. (eds.): *Herní Studia. Sborník z CONference 2013*. Brno : Flow, 2014, p. 113-114.
12 NEWMAN, J., SIMONS, I.: Make Videogames History: Game preservation and The National Videogame Archive. In *DiGRA '09 – Proceedings of the 2009 DiGRA International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory*, London : Brunel University, 2009, p. 4.
13 NAUGHTY DOG: *Crash Bandicoot N. Sane Trilogy*. [digital game]. San Mateo, CA : Sony Computer Entertainment, 2017.
14 MCFERRAN, D.: *The retro gaming industry could be killing video game preservation*. Released on 18th February 2018. [online]. [2018-04-25]. Available at: <https://www.eurogamer.net/articles/2018-02-09-the-retro-gaming-industry-could-be-killing-video-game-preservation>.
15 VEDPURISVAR, A. V.: Managing Marketing Risks. In RAJU, M. S., XARDEL, D. (eds.): *Marketing Management. International Perspectives*. 2nd edition. New Delhi : Tata McGraw-Hill Education Private Limited, 2009, p. 120.

rather rely on the model of iconic games, keeping popular genres or even existing designs. A step towards overall timelessness then might lie in creativity during the integration of advertising elements into games. However, advergames, meeting criteria of digital games' iconicity, could be still considered just as a timeless digital game, not as a timeless advergame. There remains to consider the component of advertising timelessness, ultimately representing notable benefits for involved brands in the long-term.

The essence of *advertising timelessness* lies in the fact that recipients generally accept ads very positively and its original purpose is not tied to time and place. M. Schudson states that such advertising becomes highly abstracted and self-contained.[16] In practice, it is characterized by the high degree of originality and relevance, best focused around a well-known brand that has the biggest chance to persist over time, and possible appearance changes (not radical) which would have minimal impact on their easy identification or value. Focus on a brand, not a product, is crucial particularly regarding advergames. They can be played for very long time, so promoted products could become outdated and unavailable. A similar principle is maintained even by static in-game advertising.[17] Another aspect is advertising effectiveness. However, the initial impact on sales of promoted products is probably not an applicable indicator, because it shows just the short-term results of the reporting period. Regarding the long-term point of view, relevant indicators seem to be recall, recognition, and mainly likeability of the ad. *Likeability* reflects recipients' enjoyment, opinion, attitude towards the ad. Factor analyses of commercials showed that likeability consists of such attributes as meaningfulness, believability, ingenuity, entertainment, etc.[18] It allows the timeless ad to be repeatedly and long-term published in the media (e.g. every Christmas) without increasing irritating effects on recipients, and should be always available upon recipients' demand, e.g. on social networks like YouTube.

Summarizing the stated theoretical framework, an advergame can be considered as timeless when its design meets criteria of digital games' iconicity (alternatively it is based on iconic game genres and existing game designs), and it includes promotional components (most optimally) focused on the star brand, which are characterized by high levels of recall, recognition and likeability. At the same time, the experience of playing it and positive perception (acceptance) of advertising are independent of time, the same as advergame availability.

Advergames in The Scope of Timelessness: Methodology

To be able to examine the timelessness of advergames in practice, it is logical to focus on their historical development. The research question is: Is there any advergame in digital-gaming history that can be considered as timeless? Regarding this issue, the partial goals are to investigate approaches towards advergames' design and to determine optimal (possibly the most optimal) ways of integrating brands within advergames.

16 SCHUDSON, M.: *Advertising, The Uneasy Persuasion: It's Dubious Impact on American Society*. New York : Basic Books, Inc., 1984, p. 209-212.
17 MAGO, Z.: *World of Advergaming: Digitálne hry ako nástroje reklamy*. Trnava : Faculty of Mass Media Commnunication, University of Ss. Cyril and Methodius in Trnava, 2016, p. 40-41.
18 FAM, K, S., WALLER, D.: Identifying likeable attributes: a qualitative study of television advertisements in Asia. In *Qualitative Market Research: An International Journal*, 2006, Vol. 9, No 1, p. 40-43.

In order to reach the stated goals, we apply a qualitative-quantitative content analysis on selected advergames released up to 2000. The main criteria for the research material selection are individual advergames' references within both scholars' and gamers' published texts (books, studies, blogs, etc.), which we might therefore consider as the most important advergames of the digital-gaming industry. Although in general, the history of advergames started back in the 70's with games inspired by Hollywood movies,[19] the real branded games' era started in 1976 with the arcade game *Datsun 280 ZZZAP*.[20] Nevertheless, we start selecting research material from this point, Datsun 280 ZZZAP will not be included, because it was an arcade machine, not dedicated for sale to end users. The selection period is limited to the year 2000, because exponential growth of the internet after this year caused also the change in advergames development approach – almost sole online publishing. The research material then consists of advergames developed and released on various physical mediums (depends on the type of gaming device) around the world.

We utilize two analytical categories both determined within theoretical frameworks. The *category of the game iconicity* represents aspects of digital games' timelessness, including the sub-categories of popularity (qualitative evaluation of awareness, likeability and impact; assessment of originality based on comparison with existing game designs), archetypal character (potential impact on next games development), playability (current availability), and preservation (significant market and historical values). The *category of the advertising timelessness* takes into account the rating of advertised brands as well as an overall assessment of brands and games integration. A part of the analysis is to find out the frequency of brands' integration types into game (both advertising and gaming form) with present brands' corporate identity (CI) visual elements as units of analysis. The first part of the research procedure is based on a qualitative (descriptive and discursive) analysis of each advergame of the research sample within the stated analytical categories. Besides determining the frequency of brands' integration types, the following part is also represented by the quantification of qualitative analysis sub-categories, which are related to external factors of investigated advergames (popularity, playability, preservation, inspiration by existing designs).

Qualitative Analysis

In 1983, the Mattel company released an advergame *Kool-Aid Man*,[21] one of the world's first ever games made specifically to promote a food product,[22] in this case by the Kool-Aid mascot – an anthropomorphic pitcher of drink representing the brand since 1954. The game was released for Atari 2600 and Intellivision, but the gameplay and visuals of both versions were entirely different. Another one, *Chase the Chuck Wagon*[23] was an advergame in which a dog moved through a maze chasing a wagon branded by Purina, a pet food company. The Coca-Cola Company also introduced the anti-advergame

19 BOGOST, I.: *Persuasive Games: The Expressive Power of Videogames*. Cambridge, MA : The MIT Press, 2007, p. 199-205.
20 DAVE NUTTING ASSOCIATES: *Datsun 280 ZZZAP.* [digital game]. Chicago, IL : Midway Manufacturing, 1976.
21 MATTEL: *Kool-Aid Man*. [digital game]. Segundo, CA : M Network, 1983.
22 TALJONICK, R.: *Snack attack: The most egregious junk food advergames*. Released on 6th December 2012. [online]. [2018-06-03]. Available at: <https://www.gamesradar.com/snack-attack-most-egregious-junk-food-advergames/>.
23 ICOM/TMQ: *Chase the Chuck Wagon*. [digital game]. Fremont, CA : Spectravideo, 1983.

Pepsi Invaders[24] with gameplay based on the undoubtedly timeless arcade game *Space Invaders,*[25] but the letters and logo of Pepsi replaced the original alien spaceships. Due to the short run and considerably limited production, this game is very rare among collectors.[26] In 2005, one copy was sold on eBay for 1825 USD.[27] That year, Atari created a game *Tooth Protectors*[28] exclusively available only via mail order from the Johnson & Johnson company. The player's task was to defend teeth against 'tooth decay' bombardments.[29] Although, the gameplay is similar to the game *Kaboom!*,[30] the utilized mechanics are more innovative, based on bouncing from screen borders. Later this mechanics became a core of the legendary *Arkanoid*[31]. Tooth Protectors belongs to very rare and hard-to-find group of games "that commands a premium in the collector's market".[32] Even though it is an advergame, its current price on eBay (from June 2018) moves around 450 USD.

In 1988, McDonald's also joined the group of companies, which uses games for promotion, by the game *Donald Land*.[33] A simply platformer game featured the mascot Ronald McDonald collecting hamburgers through the game. The world's famous fast-food company released more similar platformer games in the following years. *M.C. Kids*[34] in 1992, imitating *Super Mario Bros. 3*[35] gameplay with two characters for two players, and a year later *McDonald's Treasure Land Adventure*,[36] again with Ronald McDonald as a main character. Domino Pizza's mascot Noid (looking like clothed rabbit) had a quite unconventional role in the game *Avoid the Noid*.[37] Within the original gameplay design, players had to avoid him while he was delivering pizza to the top floor of a building. Noid himself became 'a promo-hero' until the sequel *Yo! Noid*,[38] although the game's goal was to stop his own super-evil twin, Mr. Green.[39] This time, gameplay was only an edited version of the Japanese game *Kamen no Ninja Hanamaru*,[40] and the included pizza-eating contest mechanics were inspired by the game *Wagan Land*.[41] A fan-made sequel of Yo! Noid was created during New Jam City 2017 as freeware.

Spot: The Video Game[42] was the first game that featured the character Spot, the current mascot of the soft-drink brand 7up visually represented by a personified red circle with 'cool' moving. The gameplay was inspired by the board game Reversi, already used in the game *Ataxx*.[43] Two years later, 7up transformed their advergames into more popular genres – a classic Nintendo style jumping-based platform game. *Spot: The Cool*

24 ATARI: *Pepsi Invaders*. [digital game]. Atlanta, GA : The Coca-Cola Campany, 1983.
25 TAITO: *Space Invaders*. [digital game]. Shinjuku, Chicago, IL : Taito, Midway, 1978.
26 BOGOST, I.: *Persuasive Games: The Expressive Power of Videogames*. Cambridge, MA : The MIT Press, 2007, p. 276.
27 QUILTY-HARPER, C.: *Atari game sells for $2,000 on eBay*. Released on 18th October 2005. [online]. [2018-06-03]. Available at: <https://www.engadget.com/2005/10/18/atari-game-sells-for-2-000-on-ebay/>.
28 DSD/CAMELOT: *Tooth Protectors*. [digital game]. New Jersey : Johnson & Johnson, 1983.
29 BOGOST, I.: *How To Do Things With Videogames*. Minneapolis, MN, London : University of Minnesota Press, 2011, p. 68.; EDERY, D., MOLLICK, E.: *Changing The Game: How Video Games are Transforming the Future of Business*. New Jersey : Pearson Education, Inc., 2009, p. 66.
30 ACTIVISION: *Kaboom!*. [digital game]. Santa Monica, CA : Activision, 1981.
31 TAITO: *Arkanoid*. [digital game]. Shinjuku : Taito, 1986.
32 WEISS, B.: *Classic Home Video Games, 1972–1984: A Complete Reference Guide*. Jefferson, NC, London : McFarland & Company, Ins., 2007, p. 125.
33 DATA EAST: *Donald Land*. [digital game]. Suginami : Data East, 1988.
34 VIRGIN CONCEPTS: *M.C. Kids*. [digital game]. London : Virgin Games, 1992.
35 NINTENDO R&D4: *Super Mario Bros. 3*. [digital game]. Kyoto : Nintendo, 1988.
36 TREASURE: *McDonald's Treasure Land Adventure*. [digital game]. Tokyo : Sega, 1993.
37 BLUESKY SOFTWARE: *Avoid the Noid*. [digital game]. ShareData, 1989.
38 NOW PRODUCTION: *Yo! Noid*. [digital game]. Osaka : Capcom, 1990.
39 TALJONICK, R.: *Snack attack: The most egregious junk food advergames*. Released on 6th December 2012. [online]. [2018-06-03]. Available at: <https://www.gamesradar.com/snack-attack-most-egregious-junk-food-advergames/>.
40 NOW PRODUCTION: *Kamen no Ninja Hanamaru*. [digital game]. Osaka : Capcom, 1990.
41 NAMCO: *Wagan Land*. [digital game]. Tokyo : Namco, 1989.
42 VIRGIN MASTERTRONIC: *Spot: The Video Game*. [digital game]. London : Virgin Mastertronic, 1990.
43 THE LELAND CORPORATION: Ataxx. [digital game]. Osaka : Capcom, 1988.

Adventure[44], based on *Super Mario 2*[45] design, was released exclusively for GameBoy. Genre change has proven to be the right answer to market demands, because the next multiplatform release, *Cool Spot,*[46] became one of the most famous advergames in history. In this remake, 7up promotion has been already integrated into the gameplay in various ways, e.g. rotating 7up logo (in SNES version) granted players extra percents to their total coolness. It is worth mentioning that the logo is visually very similar to '1up', meaning gaining extra lives for the player's character that has been used in many games including *Super Mario Bros.*[47] The logo of the Virgin company appeared in Cool Spot (e.g. in Amiga version) as well. In 1995, the sequel *Spot Goes to Hollywood*[48] was created, using isometric perspective instead of side-scrolling. The game was also released for PlayStation (PS) in 1996.

Zool: Ninja of the Nth Dimension[49] was created in 1992 in association with Chupa Chups, the worldwide brand of lollipops, as a rival to the iconic game, and later famous game series, *Sonic the Hedgehog*.[50] There are obvious similarities in gameplays of both games, particularly regarding the characters' appearance and moveability. The popularity of Zool: Ninja of the Nth Dimension caused its re-releasing to several other platforms and a sequel was created in 1993, still interconnected with Chupa Chups.

Another official mascot, this time the mascot of cheese-favoured snacks Cheetos, has appeared in game *Chester Cheetah: Too Cool to Fool*[51] in 1992. According to I. Bogost, the Cheetos provide incremental advantage in reaching the game's goal by regaining players' life, although the instrumental value of the cheese snacks remains abstract, which suggests that even instrumental power-ups often provide only incremental demonstrative advantages over archetypal ones.[52] The game was released only in North America, the same as its sequel *Chester Cheetah: Wild Wild Quest*[53] from 1993 that is generally more known among gamers. Perhaps, the reason for its popularity might be related to the gameplay design considerably inspired by *Super Mario World*.[54] Coca-Cola released an ordinary advergame in 1994 exclusively in Japan, called *Coca-Cola Kid*[55] according to the local soft-drink mascot. This side-scrolling fighting game contained besides Coca-Cola power ups, rather associative brand implementations.[56] For the first time, the advergame was also sold in a bundle version with game consoles, in this case, the Coca-Cola thematic red Sega Game Gear.

In 1996, Digital Café created an advergame for Chex cereals called *Chex Quest*[57] and it was the first software inserted in a cereal box ever. The game development was quite risky, because the creators decided to parody the concept of the iconic Doom, controversial for its violent nature, particularly after extensive discussions about violence in digital games which have continued since 1993.[58] The main difference lay in fact that the resulting advergame was a non-violent first-person shooter. The game hero Chex Warrior, a personified giant cereal flake, was zapping gooey enemies with Zorcher, a gun that teleports, not kills.[59] Nevertheless, both gameplays look considerably similar, except for the background colour of the HUD (see Fig. 1). Chex Quest became one of the most successful and effective advergames. It acquired the Golden EFFIE Award for Advertising Effectiveness in 1996 and the Golden Reggie award for Promotional Achievement in 1998, because Chex cereal sales increased by over 248%. Official sequels were released in 1997 and 2008, as enhanced completed beta versions of the 1998 game.[60] The game's fans also produced several fan-made sequels such as *Return of the Chex Warrior* and *Chex Quest Project Z*.

Picture 1: Chex Quest and Doom gameplays visual comparison
Source: ID SOFTWARE: *Doom.* [digital game]. New York, NY : GT Interactive, 1993, screenshot.; DIGITAL CAFÉ: *Chex Quest.* [digital game]. Saint Paul, MN : Digital Café, 1996, screenshot.

Pepsiman,[61] the famous Pepsi Cola advergame, was released for PS in Japan in 1999. Within this pioneer of 3D endless running advergames (however, the game has actually got an end), gamers control a running soft-drink mascot and try to avoid obstacles. The game features the most extensive integrations of brand and game. Besides the mascot himself, there are Pepsi logos, placed products (cans, crates, vending machines, marquises, shops, etc.), ads (e.g. billboards) and branded obstacles (giant cans, trucks, etc.). Although, the gameplay was partially inspired by *Crash Bandicoot*,[62] Pepsiman has provided the fun and hard challenge typical for the current popular genre of endless running games, and that means it is still played even today. It has its own leaderboard on Speedrun.com (last record added in July 2018)[63] and was also one of games played at Summer Games Done Quick 2016. The new century brought another Crash Bandicoot-like advergame *M&M's: The Lost Formulas*,[64] in which players controlled a personified yellow candy through a stylish cartoonish aesthetic world.[65] In the following nine years a total of seven other M&M's themed games were published.

44 VISUAL CONCEPTS: *Spot: The Cool Adventure*. [digital game]. London : Virgin Games, 1992.
45 NINTENDO R&D4: *Super Mario Bros. 2.* [digital game]. Kyoto : Nintendo, 1988.
46 VIRGIN GAMES: *Cool Spot.* [digital game]. London : Virgin Interactive, 1993.
47 NINTENDO R&D4: *Super Mario Bros.* [digital game]. Kyoto : Nintendo, 1985.
48 EUROCOM: *Spot Goes to Hollywood.* [digital game]. London : Virgin Interactive, 1995.
49 GREMLIN GRAPHICS: *Zool: Ninja of the Nth Dimension*. [digital game]. Sheffield : Gremlin Interactive, 1992.
50 SONIC TEAM: *Sonic the Hedgehog.* [digital game]. Tokyo : Sega, 1991.
51 SYSTEM VISION: *Chester Cheetah: Too Cool to Fool* [digital game]. Tokyo : Kaneko, 1992.
52 BOGOST, I.: *Persuasive Games: The Expressive Power of Videogames*. Cambridge, MA : The MIT Press, 2007, p. 161.
53 KANEKO: *Chester Cheetah: Wild Wild Quest.* [digital game]. Tokyo : Kaneko, 1993.
54 NINTENDO EAD: *Super Mario World*. [digital game]. Kyoto : Nintendo, 1990.
55 ASPECT CO.: *Coca-Cola Kid*. [digital game]. Tokyo : Sega, 1994.
56 MAGO, Z.: Self- and cross-promotion within digital games. In PETRANOVÁ, D., MATÚŠ, J., MENDELOVÁ, D. (eds.): *Marketing Identity: Brands we love – part I.: Conference Proceedings from International Scientific Conference 8th – 9th November 2016*. Trnava : Faculty of Mass Media Communication, University of Ss. Cyril and Methodius in Trnava, 2016, p. 341-343.
57 DIGITAL CAFÉ: *Chex Quest*. [digital game]. Saint Paul, MN : Digital Café, 1996.
58 KENT, S. L.: *The Ultimate History of Video Games*. New York : Three Rivers Press, 2001, p. 466-478.
59 SMITH, K. A.: *Selling Your Soul for Fun and Profit: The 10 Best Advergames*. Released on 19th October 2011. [online]. [2018-06-25]. Available at: <https://www.pastemagazine.com/blogs/lists/2011/10/selling-your-soul-for-fun-and-profit-the-10-best-advergames.html>.
60 Ibidem.
61 KID: *Pepsiman*. [digital game]. Tokyo : KID, 1999.
62 NAUGHTY DOG: *Crash Bandicoot*. [digital game]. San Mateo, CA : Sony Computer Entertainment, 1996.
63 *Pepsiman*. [online]. [2018-07-26]. Available at: <https://www.speedrun.com/Pepsiman>.
64 BOSTON ANIMATION, INC.: *M&M's: The Lost Formulas*. [digital game]. New York : Simon & Schuster Interactive, 2000.
65 TALJONICK, R.: *Snack attack: The most egregious junk food advergames*. Released on 6th December 2012. [online]. [2018-06-03]. Available at: <https://www.gamesradar.com/snack-attack-most-egregious-junk-food-advergames/>.

Results

The content analysis consisted of 21 advergames in total (see Table 2). The research sample selection itself has already assumed some level of awareness, but based on the amount and frequency of references, advergames Pepsi Invaders, Zool: Ninja of the Nth Dimension, Cool Spot, Chex Quest and Pepsiman belong to the most popular. Seven of the analysed advergames have got at least one sequel and six of such sequels are even a part of the research sample. All the analysed advergames are still playable (emulated) through several online channels. Regarding their preservative and collector's value, it seems that more valuable advergames are those released on limited types of platform like Kool-Aid Man, Chase the Chuck Wagon, Pepsi Invaders, Tooth Protectors, Chex Quest as well as those released exclusively for certain regions, e.g. Pepsiman and Coca-Cola Kid in Japan.

The design of 12 (57.1 %) advergames was obviously inspired by already existing and commercially successful games (e.g. Super Mario Bros., Sonic the Hedgehog, Doom, Crash Bandicoot); in other cases, the design could not be directly associated with designs of existing games, but these advergames mostly belonged to the most popular and dominant genres of that time (e.g. platform games). Within the analysis of brand integration into games, we took into account only the most prevalent implementations, omitting minority ones. Mascots were the most frequent, even 14 (66.6 %), 6 (28.6 %) were CI visuals, especially brand logos, and 1 product (4.8 %), the anthropomorphic nature of which (Chex Warrior) is comparable with characteristics of mascots. On the other hand, 13 mascots and one product together figured as player's avatars (66.6 %) and 1 mascot (4.8 %) acted as a non-playable character (NPC). All CI visuals (28.6 %) were a part of the game environment (textures, items).

Table 2: Results of advergames' analysis

Advergame		**Advertiser**	**Major brand integration**		**Gameplay design originality**	
Title	**Rel.**		**Ad**	**Game**	**Title used as inspiration**	**Rel.**
Kool-Aid Man	1983	Kool-Aid	mascot	avatar	indirect	-
Chase the Chuck Wagon	1983	Purina	CI visuals	environment	indirect	-
Pepsi Invaders	1983	Coca-Cola*	CI visuals	environment	Space Invaders	1978
Tooth Protectors	1983	Johnson & Johnson*	CI visuals	environment	Kaboom!	1981
Donald Land	1988	McDonald's*	mascot	avatar	indirect	-
Avoid the Noid	1989	Domino's Pizza	mascot	NPC	indirect	-
Yo! Noid	1990	Domino's Pizza	mascot	avatar	Kamen no Ninja Akakage	1988
Spot: The Video Game	1990	7up	mascot	avatar	Ataxx	1988
M.C. Kids	1992	McDonald's*	CI visuals	environment	Super Mario Bros. 3	1988
Spot: The Cool Adventure	1992	7up	mascot	avatar	Super Mario Bros. 2	1988
Zool: Ninja of the Nth Dimension	1992	Chupa Chups	CI visuals	environment	Sonic the Hedgehog	1991
Chester Cheetah: Too Cool to Fool	1992	Cheetos	mascot	avatar	indirect	-
Zool 2	1993	Chupa Chups	CI visuals	environment	Sonic the Hedgehog	1991
Chester Cheetah: Wild Wild Quest	1993	Cheetos	mascot	avatar	Super Mario World	1990
McDonald's Treasure Land Adventure	1993	McDonald's*	mascot	avatar	Sonic the Hedgehog 2	1992
Cool Spot	1993	7up	mascot	avatar	indirect	-
Coca-Cola Kid	1994	Coca-Cola*	mascot	avatar	indirect	-
Spot Goes to Hollywood	1995	7up	mascot	avatar	indirect	-
Chex Quest	1996	Chex	product	avatar	Doom	1993
Pepsiman	1999	Pepsi*	mascot	avatar	Crash Bandicoot	1996
M&M's: The Lost Formulas	2000	M&M's	mascot	avatar	indirect	-

** The brand belongs to 100 best global brands 2018.*[66]

Source: own processing

Discussion

Whereas conditions of advergames' general awareness and popularity have been already reflected by the selection of research material, as well as subsequently found evidence of both their formal (commercial, institutional) and participatory preservation, the analysis itself could focus on other timeless criteria related to game design and brand integration. The fact that the design of more than half of the analysed advergames was based on (or directly adapted from) other already commercially successful games and genres indicates that their developers, as well as involved brands, wanted to minimalize risk and capitalize on verified game formats by market. In general, simple gameplay with adequate challenges presented in game represented the basic principle for advergames development. Paradoxically, efforts to make their gameplay/design original and so diversify themselves were almost solely tied to the integration of brands into games. Most likely, it was an attempt to generate fun based on the idea of playing with the brand in familiar game contexts.

It is interesting that the most frequent way of brand integration into games was in the form of a mascot, but on the other hand, it seem to be quite a smart idea, particularly regarding the utilization of digital games. Mascots are very useful in the process of brand personifying, develop a good brand image and affect customer perception in the

66 INTERBRAND: *Best Global Brands 2018 Rankings*. [online]. [2018-09-10]. Available at: <https://www.interbrand.com/best-brands/best-global-brands/2018/ranking/>.

long term.[67] Paraphrasing A. Patterson, Y. Khogeer and J. Hodgson, mascots are unforgettable characters created by the marketing industry that function as brand advocates and are equal, if not superior, to the very best that popular culture offers.[68] It follows that mascots are ideal game characters, and in addition, their implementation as player's avatars ensure the highest connection of gamers with brands through immersion. Practically it means that players experience gameplay identified with interactive personification of brand attributes, without the need to overcrowd the game environment by associative elements of brand visuals. Applying in-game advertising principles, such plot integration has the potential to generate premium advertising effects.[69] As stated, the brand mascot as the player's avatar seems to be the most optimal and perspective way of brand integration within advergames in general.

Although, the carried out quantitative analysis followed only the most obvious and major brand integrations, we should mention that some secondary (supportive) implementations had slightly more important roles in games as well. For example the logo of Pepsi as the enemy boss in Pepsi Invaders; McDonald's restaurant and products as stats (power ups) increasing items in Donald Land; Cheetos snacks and 7up logo as life increasing items in Chester Cheetah and Cool Spot games; Pepsi cans as collectible items in Pepsiman. Based on a theoretical framework, interpretation of content analysis results, and taking into account also the global reach of brands, a clear long-term attributability of the mascot to brand (e.g. 7 up mascot Spot has a rather obscure contemporary meaning), and presence of playing motivation aspects (fun, adequate or even more demanding challenge), as representative examples of really timeless advergames, we may definitely note Pepsiman.

There are two research limitations, which need to be mentioned. The overall analysis was realized by one researcher, so results might be affected by his subjective attitudes, even with the maximum effort to maintain scientific objectivity. The second limitation lies in the fact that some aspects of digital games' iconicity (e. g. popularity) as well as constancy of experience from playing advergames (timelessness of process/activity) were determined based on indirect indicators, not primary data obtained from relevantly focused research.

Conclusion

Advergames have belonged in the digital-gaming industry since its very beginning, and therefore currently they are a part of both game and popular cultural heritage. In this context, we are able to apply the theoretical concept of timelessness to advergames. Reflecting on the dual nature of advergames, this process is slightly complicated, because at first it is necessary to take into account aspects of both digital games' and advertising timelessness, then also the fact that games are products and process at the same time. It seems that advergames could be considered as timeless when their design meets the criteria of digital games' iconicity (popularity, becoming an archetype, playability, preservation), and its promotional features are focused around star brands, characterized by high level of recall, recognition and likeability. Concurrently, experience of playing advergames as well as a positive perception (acceptance) of their advertising side is not dependent on time, same as with the availability of advergames.

The research examination of advergames' timelessness in practice was focus on the question, if there is any advergame in digital-gaming history that can be considered as timeless, and partial goals were to investigate approaches towards advergames' design and ways of integrating brands within them. Results of qualitative-quantitative content analysis on advergames released until 2000 show that advergames' design is highly inspired by already commercially successful games and genres. Simple gameplays are accompanied by adequate challenges in order to increase motivation for playing them. Finally, the originality factor represents the implementation of brand features to generate fun based on the idea of playing with the brand in familiar game contexts. Brand mascots in the form of player's avatars then seems to be the most optimal brand integration from the long-term point of view. Based on these results, we may definitely note Pepsiman as a representative example of a timeless advergame. Nevertheless, many analysed advergames actually met timelessness criteria set by the theoretical framework just partially, they are important parts of both digital-gaming and advertising sectors, therefore in a certain more liberal sense we could consider most of them as timeless.

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67 MOHANTY, S. S.: Growing Importance of Mascot & their Impact on Brand Awareness – A Study of Young Adults in Bhubaneswar City. In *International Journal of Computational Engineering & Management*, 2014, Vol. 17, No. 6, p. 44.

68 PATTERSON, A., KHOGEER, Y., HODGSON, J.: How to create an influential anthropomorphic mascot: Literary musings on marketing, make-believe, and meerkats. In *Journal of Marketing Management*, 2013, Vol. 29, No. 1-2, p. 69.

69 MAROLF, G.: *Advergaming and In-Game Advertising: An Approach to the next Generation of Advertising*. Saarbrücken : VDM Verlag Dr. Müller, 2007, p. 97-98.

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Binaural and Ambisonic Sound as the Future Standard of Digital Games

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ABSTRACT:
The author of this study suggests an idea that the auditive element of digital games is soon going to be one of the most important factors influencing their overall success, popularity, and originality. He analyses the phenomenon of binaural and ambisonic sound, its evolution and uses in the context of modern audio-visual work, primarily focusing on games. The auditive component and its increasingly important role areanalyzed in connection with the graphic design of games, virtual reality, as well as the popularity of specific games. This paper also focuses on audio-games, the use of binaural sound (which was first used on a large scale in Hellblade: Senua's Sacrifice) and various hybrid digital games, which are balancing between classic games and audio-games. Argumentation is based on an assumption that binaural sound is the way to ambisonic sound, which (within the context of the immersive and interactive character of digital games) predestines the new standard and shows an entirely new way of creating and using digital games at the same time. All of this is reflected in the context of the graphic design of digital games and their future.

KEY WORDS:
ambisonic sound, binaural sound, difficulty, digital games, film, graphics, sound.

Introduction

We can occasionally observe that certain types of media have one very interesting common feature: one of their specific elements is always at the front, evolving faster and better, while other parts have to catch up with it. In most cases, the reason is an actual technology being on a higher or lower level of development. This study's primary focus is the auditive aspects of digital games. However, there is a specific paradox to be mentioned right away at the beginning. Digital games as a medium are most frequently compared to cinematography. Although many researchers refute this kind of comparison, it is easy to see the similarities. Both digital games and movies are visual – at first sight at least. Cinema has evolved from photography (which is – simply said – represented by two-dimensional pictures) and its first steps in the context of technology were primarily visual. Although digital games have slightly different "silent era" (S. Horrowitz and S. R. Looney mention era between 1940 – 1970, by the end of which creative hardware engineers figured out ways to make the earliest computer chips generate primitive sounds and effects),[1] they had similar a start as movies. Their visual execution quickly moved ahead of their auditive element. This way, our eyes were stimulated much sooner and more effectively. We can see this kind of evolution as completely natural until we confront it from a little deeper and more detailed viewpoint. M. Chion says human beings are *vococentric.*[2] Simply said, that means that our sense of hearing is nearly as important as our sight. For example, we respond to the sound of a human voice and its general frequency spectrum much more sensitively than to other sounds. Hearing also fulfills the role of a physi-

1 HORROWITZ, S., LOONEY, S. R.: *The Essential Guide to Game Audio. The Theory and Practice of Sound for Games*. New York : Focal Press, 2014, p. 21.
2 CHION, M.: *Voice in Cinema*. New York : Columbia University Press, 1999, p. 6.

cal anchoring of sounds in space in a way and gives objects their space/time dynamics. Of course, sight is not hanging behind. It has similar abilities – it distinguishes human faces much faster, notices only a slight movement etc. Even though, the auditive element of both digital games and movies was always lagging behind for decades.

While meditating on sound in games, U. Reiter writes that perceived quality of in-game audio is not a question of audio quality alone. As audio is usually only a part in an overall game concept consisting of graphics, physics, artificial intelligence, user input, feedback and so forth, audio has been considered to play a relatively minor role in the overall experience that a game provides. Consequently, a lot of effort has been put into providing near photo-realistic representations of (virtual) game scenarios to the player, but only little into audio.[3] In other words, the way we experience a specific digital game is often not about how good or bad audio or graphics are, but literally the other way round – sometimes both of these can be of low quality, but we love the game as a whole anyway. M. Chion implies something similar when he writes about an *added value* in cinematography. It is partly bilateral (the image also influences the way we perceive sound). In a cultural situation of visio-audition, however, such as a concert, where we traditionally focus our conscious attention on what we hear, added value functions primarily in the other direction. The sight of an energetic gesture by a musician will make us hear a more powerful sound.[4] When describing the relationship of visual and auditive elements in digital games, G. King and T. Krzywinska write that qualities of vision and sound are usually the most potent sources of impressions of presence in games.[5]

How is it possible then, that from the release of the first game with sound (S. Horrowitz and S. Looney list Pong from 1972[6] as the first game with sound), only *now* the filmgoers, gamers or scientists are carefully starting to talk about the so-called" golden era of sound"? From a certain point of view, a question like this opens an interesting issue dealing with our tendency to be stimulated primarily by visual impulses. We could explain this the pragmatic way. Just like in cinema, where we had to wait several decades for superior microphones, that would allow recording of actor's voices or singing, digital games were likewise technologically dependent on the development of faster computer chips, sound cards etc. Nevertheless, if we focus on binaural sound, we can paradoxically trace its evolution even before the era of the first films with sound.

It's not Just Stereo – Binaural Sound

There are several reasons why we have decided to incorporate the phenomenon of binaural sound in this study. One of them is related to a simple fact that human beings have binaural hearing. It is natural for us to listen to sounds with two ears and as D. M. Huber and R. E. Runstein write, although one ear can't discern the direction of a sound's origin, two ears can. This capability of two ears to localize a sound source within an acoustic space is called *spatial* or *binaural localization*.[7] This can be easily explained by an example: when we hear a specific sound from our right side, the frequencies of this sound (mainly midrange and treble) arrive faster at our right ear than at the left one. Because of the obstacle that our head is, sounds that get to our left ear first have to overcome a series of reflections manifested in latency. Binaural recording is a unique way of recording stereo in which a simulated human head, with microphones where the ears normally go, is used to record the signal and listening is done with headphones. This method can produce a convincing recording of a sound field. Unfortunately, there is one large drawback: it works poorly when reproduced on speakers. Recently, systems have been developed that use digital signal processing to render the effect on loudspeakers, but the system works only for a small listening area and requires the listener to remain stationary.[8] The difference between binaural sound and classic stereo (or a two-channel sound) resides in the consideration of each ear separately in respect to the sources of sound. This applies to sound reproduction as well.

So far, we have used the word "paradox" several times. In connection with the before- mentioned silent era of movies and digital games, it can appear as paradoxical that the first binaural recording (or reproduction more precisely) was realized in 1881 – hence much sooner than anyone could even contemplate about any movie era, not mentioning the fact that digital games didn't even exist. This binaural transmission was demonstrated by inventor Clement Ader, who used pairs of microphones in front of the stage of the Paris Opera, sending signals to left and right earpieces of listeners elsewhere in the city. Note 'pairs', plural: this was in the days of the single-point-to-single-point telephone, before multicasting.[9]

Even though this technology pre-existed movies and digital games, it was not successful – neither telephones (which have remained mono-aural to this day) nor the movie industry had adopted it at that time. Of course, as a technology, the binaural recording was not left "dead". It just stayed at a minor level of use. Later on, it started to be used in some of the radio broadcasts (for example BBC Radio 4) and in particular, radio plays. Forasmuch as this technology required the use of stereo headphones, which were invented as late as 1952, there was logically not a big demand. The first binaural microphone sets, as we know them today (artificial human head with microphones in ears), appeared in the 1970s'. Soon a few pop music albums showed up, using this technique for capturing instruments. It took several decades for headphones to be actually mass-produced and we could easily say that only during the last 20 or so years, headphones have been actually massively used, which created the demand for quality binaural sound again. When talking about headphones, it should be mentioned that they overall produce a much more intensive listening experience. They isolate us from the surrounding environment (of course, that depends on their construction and whether they are open or closed), thus creating bigger immersion. We could demonstrate this fact by an explosion of the popularity of the ASMR (Autonomous Sensory Meridian Response) community in recent years. ASMR recordings work exclusively with binaural sound only and have the capability to induce an equivalent of so-called auditory-tactile synesthesia. This means that when specific sounds (recorded binaurally) are presented to some people, they actually feel physical sensations or excitement in different parts of their body.[10]

3 REITER, U.: Perceived Quality in Game Audio. In GRIMSHAW, M. (ed.): *Game Sound Technology and Player Interaction. Concepts and Developments*. New York : Information Science Reference, 2011, p. 153.
4 CHION, M.: *Film, A Sound Art*. New York : Columbia University Press, 2003, p. 213.
5 KING, G., KRZYWINSKA, T.: *Tomb Raiders and Space Invaders. Videogame Forms and Contexts*. London : I. B. Tauris, 2006, p. 109.
6 HORROWITZ, S., LOONEY, S. R.: *The Essential Guide to Game Audio. The Theory and Practice of Sound for Games*. New York : Focal Press, 2014, p. 23.
7 HUBER, D. M., RUNSTEIN, R. E.: *Modern Recording Techniques*. Oxford : Focal Press, 2005, p. 62.
8 KADIS, J.: *The Science of Sound Recording*. Oxford : Focal Press, 2012, p. 95.
9 FOX, B.: Early Stereo Recordings. In *Studio Sound*, 1982, Vol. 24. No. 5, p. 36.
10 NAUMER, M., VAN DEN BOSCH, J. J. F.: Touching Sounds: Thalamocortical Plasticity and the Neural Basis of Multisensory Integration. In *Journal of Neurophysiology*, 2009, Vol. 102, No. 1, p. 7-8.

Alongside the development of different recording techniques, it is also interesting to watch the development of the graphic design of digital games, or rather how this development was perceived. In an article from 2001, editors of GameSpot magazine ask the question "How important are graphics to games?" in it. Today, in 2018, it is extremely interesting for us to read all the answers of interviewees, although to find the connection with sound can be a bit tricky. Among other people, one of the asked was Jake Simpson, the lead programmer of then Raver Software. Nearly all the answers tended to suggest that graphics is only somewhat important to games. Simply said, visual presentation of digital games was primarily considered as an element, that should draw the initial attention of a player or support the narrative (of course, the narrative is important in the context of the game genre). One of the conclusions of this article was that sophisticated visual effects were mainly a market's demand connected to all of the new and (then) powerful hardware. However, before the introduction of 3D acceleration, or at least before the explosion of three-dimensional games, graphics weren't as important, and it was fairly easy to look past a game's ugly exterior if it had solid gameplay.[11]

This study is trying to point out to a contrast between the extremely fast development of visual representation of digital games (cinema, in this case, serves as an ideal supporting point), somehow automatic demand for good graphics and a fact, that an actual good quality sound existed at the time when games hadn't even dreamt of good graphics. From a certain viewpoint, we could argue that one of the reasons for this could be an audience/users and their own evolution. Filmgoers of the 21st century can hardly even imagine the way audiences of the late 19th century perceived the first movies. In a similar fashion, we can hardly picture the excitement of the first digital game players, who were fascinated by utterly primitive graphics and the simplest level of interactivity. However, both of these "audiences" (filmgoers and gamers) grew with their favorite mediums. Thus it is only logical to expect a shift in preferences of both groups – there are many specific qualities to both mediums which people can be focused on. At this point, the importance of audio could come out as being an important part of both digital games and movies. It was always "on the same boat", but consistently kept back. Now, the graphic design of digital games has undergone a huge transformation in quality, including the ever-growing palette of virtual reality (VR) devices. Nevertheless, the auditive component is slowly starting to play a bigger role in the same context. With a bit of exaggeration, we could even argue that audio is in the lead. While the developers of VR devices struggle to create the best, the simplest, most effective, portable, comfortable and - last but not least – mass-produced and available solution, audio has found its solution a long time ago. There is a phenomenon called *ambisonic sound* that appears to go arm in arm with VR and is just starting to be interesting. We assume that this type of sound could be the new audio-standard and we even dare to claim that it could also provide a completely new formal approach to game design.

Ambisonic Sound, Audio-Games and New Approaches

The ambisonic microphone allows a greater post-recording manipulation of sound. It consists of four separate directional capsules mounted in the faces of a tetrahedron (three-sided pyramid) so that they aim at the odd-numbered corners of a cube: the elements are left-front up, right-rear up, right-front down, and left-rear down. These signals can then be matrixed to produce a wide range of simulated pairs and some ambiance.[12] Simply said, this type of microphone is able to record the sound or atmosphere of a specific place in all directions, not just left or right, but also up, down, rearward etc. We could even say that this microphone is a kind of extension of so-called middleware, which is software that first appeared in late 90's of the 20th century. For sound designers or composers, this software was a way how to gain even bigger control over how game audio behaved in digital games. Why was middleware needed? Music and sound designers and programmers developed middleware so that designers and composers could gain more control over how their audio was used in games. Middleware is based on the idea that the digital game is an interactive medium, so all audio elements within the game should be interactive as well.[13] The main advantage of ambisonic recording is a simple fact – with the help of specific plugins and technologies, we can get four separate audio tracks which we can then use in a precise simulation of space. We can also easily apply a technique which tracks our head while it moves. In comparison with binaural sound then, ambisonic recording allows us to utilize head tracking, which is a technology scanning the movement of our head (for example in the context of VR) and this way it creates nearly perfect immersion.

We could describe ambisonic sound as an auditive version of 360-degree videos, which started to be widely used and available around 2015 when YouTube started to support this format. In these videos, we can achieve similar results as with ambisonic recording – using a set of several video-cameras (recently, special cameras allowing this technique only with one device appeared on the market) we can record a video, in which we can rotate seamlessly in all directions. One of the problems with these videos, in the beginning, was that the soundtrack was usually only in stereo. Newer devices such as GoPro Fusion (which appeared on the market by the end of 2017) are already capable of recording 360-degree audio as well. Probably one of the most interesting technological creations these days is the NT-SF1 microphone, which was created with collaboration betweenSoundfield (a company considered to be a pioneer inambisonic recording) and Rode (one of the most widely known microphone producing companies). It is interesting to mention that this kind of sound recording and streaming was previously used in big football stadiums as one of the broadcasting microphones. Of course, in the context of digital games, this kind of technology is only interesting after it is available at the consumer level.

This microphone is capable of the exact recording technique as described above. A sound recording is captured into four separate tracks. As a part of a package, special software is provided, which is able to manipulate these four tracks any way we need. Thus, it is not only possible to create a 7.1 surround mix (current level of Dolby Atmos system mostly used in cinemas), but also incorporate head tracking and create a completely immersive video that imitates the movement of our head (or a mouse cursor) while modulating the sound accordingly. In the context of digital games, this means the way to complete and perfect immersion – this way we can literally put a player into a game on an auditive level. If we remember the beginning of this article, specifically the part about how physical the role of sound can be, it is easy to imagine the effectiveness of ambisonic sound. Within the frame of digital game evolution, this technology is still only at the beginning. There are already several games where sound plays a primary role. *Hellblade: Senua's Sacrifice*[14] was

11 *QOTW: How Important Are Graphics to Games?*. Released on 26th June 2001. [online]. [2018-10-10]. Available at: <https://www.gamespot.com/articles/qotw-how-important-are-graphics-to-games/1100-2693475/>.

12 KADIS, J.: *The Science of Sound Recording*. Oxford : Focal Press, 2012. s. 95.

13 HORROWITZ, S., LOONEY, S. R.: *The Essential Guide to Game Audio. The Theory and Practice of Sound for Games*. New York : Focal Press, 2014, p. 47.

14 NINJA THEORY: *Hellblade: Senua's Sacrifice*. [digital game]. Cambridge : Ninja Theory, 2017.

released on PlayStation 4 in 2017 and is the first "big" game which fully incorporatesthe possibilities of binaural sound. The creators of this game not only created a totally immersive game world but also managed to use this technique as a way to portray the gradually evolving psychosis and hallucinations of the main character. The team responsible for this game (Ninja Theory) went even further and consulted the symptoms of psychosis with neuroscientists.There is another phenomenon, which we haven't discussed yet – audiogames. These games exist either with no graphics at all or use only basic/minimal graphic design.

Audio Games

Audio games as a concept have been around for many years. The first reported audio game sold was Atari's *Touch Me*[15] in 1974. This was a memory game where a series of tones would play, and the user tried to recall the tone sequence and press appropriate buttons to mimic it. Although it was also a visual game (lights flashed in concert with the tones), the game was simple enough that it could be played by people as a pure audio game.[16] There are a lot of games we could easily misinterpret as audio games. Games like *Guitar Hero*,[17] *Parappa the Rapper*[18] or *Audio Surf*[19] are based on sound and rhythm, but they all have graphics and would be actually unplayable without them. In the 1980s a number of interactive fiction or adventure games were being developed. These involved users being given text descriptions of a location ("you are in a large cave" or "you are on the bridge of a spaceship", etc.) The user could then enter text to say what action they wanted to do ("go north", "pick up gun", etc.) The gameplay normally involved a number of puzzles presented in descriptions and solved by entering a series of commands. By connecting these games to a text-to-speech interface, they could be made playable by sound only. Like many audio games, these were designed for people who were blind or partially sighted. It can be thought of as an interactive radio drama. The user listens to segments of the story and then the game chimes and he can make selections which decide how the plot unfolds. *Audio Space Invaders*[20] was a Pc game that used 3D ambisonics. The gameplay consists of shooting flying invading aliens and does not require a graphical interface to be played. Much of the game is based on the user hearing where the enemy is: to their left, right, in front, behind. Different sounds represent different types of enemy ships, the Doppler effect[21] indicates a ship's direction of movement, and pitch represents closeness to the player.[22]

The horror series *Papa Sangre*[23] (2010 – 2013) and the science fiction *Nightjar*[24] (2011) brought more popularity to this genre. Both utilized binaural sound in a large extent, the player had to avoid different obstacles, solve puzzles and gather musical notes.

15 ATARI: *Touch Me*. [digital game]. Sunnyvale, CA : Atari Inc, 1974.
16 KIRKE, A.: When the Soundtrack Is the Game: From Audio-Games to Gaming the Music. In WILLIAMS, D., LEE, N. (eds.): *Emotion in Video Game Soundtracking*. Cham : Springer International Publishing, 2018, p. 66.
17 HARMONIX: *Guitar Hero*. [digital game]. Cambridge, MA : RedOctane, 2005.
18 NANAON-SHA: *PaRappa the Rapper*. [digital game]. San Mateo, CA : Sony Computer Entertainment, 1996.
19 FITTERER, D.: *Audiosurf*. [digital game]. Bellevue, WA : Valve Corporation, 2008.
20 For more information, see: MCCRINDLE, R. J., SYMONS, D.: *Audio space invaders*. Reading : The University of Reading, 2000.
21 Remark by the author: Doppler effect is based on a change of frequency or a length of a sound wave in relation to an observer. The most typical example is a sound of a car horn passing around.
22 KIRKE, A.: When the Soundtrack Is the Game: From Audio-Games to Gaming the Music.In WILLIAMS, D., LEE, N. (eds.): *Emotion in Video Game Soundtracking*. Cham : Springer International Publishing, 2018, p. 66.
23 SOMETHIN' ELSE: *Papa Sangre*. [digital game]. London : Somethin' Else, 2010.
24 SOMETHIN' ELSE: *The Nightjar*. [digital game]. London : Somethin' Else, 2011.

Both also used voice commentary as the way to navigate throughout the story. There is also something like an intermediate level between audio games and classic digital games. Games like *Devil's Tuning Fork*[25] (2009) or *Lurking*[26] (2014) use minimalistic graphic design and a navigation system that resembles echolocation of dolphins. These games also make use of a microphone connected to the computer, responding to a player's sounds. This way the sounds add to the effectiveness of the general atmosphere of the game (both games – especially Lurking – are horror games) and create even bigger immersion effect (in *Lurking*, all the player's sounds lure enemies towards his or her location).We mention all these games also because there is another important element which we haven't discussed yet. In the context of this article, the *difficulty* plays an interesting role. Should we consider this factor through a prism of graphics or visual portrayal of the game, interesting results could emerge, involving players as well. In 2012 Dylan Viale – then a fifth-grader – created a game called *Quacky's Quest*.[27] It was based on a classic labyrinth and collecting diamonds. His biggest motivation was to create a game that would make his blind grandmother be able to play with no problems. He changed the whole concept and started working on an audio game. One of his conclusions is very important to us: during the process of testing the game, Dylan discovered that blindfolded players were actually slower at the game than his blind grandmother, who is used to taking cues from sound.[28] That shows us one very interesting fact: with the coming of audio games, there comes also a new kind of challenge and difficulty. In the next chapter, we reflect on the relationship of these factors – sounds, graphics, and evolution of technology.

Graphic Design of Digital Games in the Context of Sound, Difficulty and a New Challenge

People usually tend to say that digital games used to be much more difficult. This myth partly loses its "mystical" powers though, especially when we put it within the context of the simple fact that many games were made difficult mainly to make players to put more coins into the arcade consoles. But if we look deeper into this subject, we find that the general difficulty of digital gameshas actually really fallen and that many game developers are consciously simplifying all of the known concepts and focus primarily on a fluent flow of narrative, action, perfect graphics etc. Take the*Mass Effect*[29] series or *The Elder Scrolls*[30] for instance. We can observe this tendency in both series – branched menus with abilities and skills or more or less complicated crafting system – everything seems to be out of fashion. Recently, however, we could notice a slight return of higher difficulty

25 DEPAUL GAME ELITES: *Devil's Tuning Fork*. [digital game]. Chicago, IL : DePaul Game Elites, 2009.
26 LURKINGGAME: *Lurking*. [digital game].Singapure : Lurkinggame, 2014.
27 VIALE, D.: *Quacky's Quest*. [digital game]. Martinez, CA : D.Viale, 2012.
28 COWEN, A.: *Success Story: A Video Game for the Blind*. Released on 24th May 2012. [online]. [2018-10-21]. Available at: <https://www.sciencebuddies.org/blog/success-story-a-video-game-for-the-blind>.
29 BIOWARE: *Mass Effect*. [digital game]. Redmond, WA : Microsoft Game Studios, 2007.
30 BETHESDA SOFTWORKS: *The Elder Scrolls*. [digital game]. Rockville, MD : Bethesda Softworks, 1994 – present.

in digital games. *Dark Souls*[31] was the name that resonated most vividly recently, a game from From Software, which discourages many players with its uncompromising fighting system and precarious world. This series (ended with its third installation in 2016) is interesting in the way of not telling the player anything, with the narrative being dominated by minimalistic *environmental storytelling*.[32] In simplified words we can say that all the installments of these digital games (including *Bloodborne*,[33] made by the same team, in a slightly more horror setting) have one thing in common: most enemies and nearly all the bosses are able to kill the player on one or two hits and the usual methods of avoiding this kind of difficulty (for example *grinding*[34]) simply don't work in this universe – a player simply has to master the fighting system of the game, making it the only way to actually finish the game. This series (gaining cult status already) has in a way paved the path for other games, which plucked up courage and increased their difficulty as well. Apart from digital games we could consider "clones" of Dark Souls (*Titan Souls*,[35] *The Surge*,[36] *Salt and Sanctuary*[37]), there are - or are being made - many games that are inspired by it (*Nioh*,[38] *Lords of the Fallen*,[39] *Hyper Light Drifter*,[40] *Ashen*,[41] *Blasphemous*[42]). In other words, a demand for higher difficulty and complexity has suddenly appeared.

Of course, we shouldn't be surprised. We have to bear in mind that the player audience is evolving. It is logical to assume that a generation of players who grew up on difficult and more complicated digital games in the past simply needs a bigger challenge, which is often not included in AAA titles, even with difficulty turned to "hard". We assume that – within the context of auditive aspects of digital games – it is exactly this feature that could fit into this equation. The sound could reveal a new type of formal approach implementing new kinds of difficulty in digital games. There are several arguments for this assumption. First and foremost it is very difficult to indicate any connection between the graphics and the success of the digital game. Game rankings that we can always look up on the portals like Metacritic.com show us that great deals of games longstanding at the highest rankings (from the viewpoint of players as well as critics) are actually games ten or even fifteen years old.[43] It is very difficult to talk about hi-tech graphics from this point of view because these digital games are obviously being celebrated for something completely different. If we would remember an analogy between games and movies, we could also find out some interesting things based on how for example the horror genre was perceived in recent years. Continual repetition of clichés, stereotypes and the same procedures all over again cannot be saved by the visual level of the movie. Contrariwise, it's the movies made with a minimalistic approach and accentuating sound that are rated as notable and progressive. Pushing the limits of image reproduction is likewise showing potentially dead ends.

31 FROMSOFTWARE: *Dark Souls.* [digital game]. Tokyo : Namco Bandai Games, 2011.
32 Remark by the author: Way of telling the story without dialogues or cutscenes, more focusing on hints and symbols player can see in the surrounding world, on its interaction with this world, exploration or details in which names and descriptions of items are inscribed or placed etc. If environmental storytelling is done right, there could be not a single cutscene and the player can put the pieces of story, atmosphere, NPC's behaviour together by himself.
33 FROMSOFTWARE: *Bloodborne.* [digital game]. San Mateo, CA : Sony Computer Entertainment, 2015.
34 Remark by the author: Repeating of some action, usually killing certain types of enemies over and over again resulting in gathering experience points easily, thus levelling up faster.
35 ACID NERVE: *Titan Souls.* [digital game]. Austin, TX : Devolver Digital, 2015.
36 DECK13 INTERACTIVE: *The Surge.* [digital game]. Paris : Focus Home Interactive, 2017.
37 SKA STUDIOS: *Salt and Sanctuary.* [digital game]. Seattle, WA : Ska Studios, 2016.
38 TEAM NINJA: *Nioh.* [digital game]. San Mateo, CA : Sony Interactive Entertainment, 2017.
39 DECK13 INTERACTIVE: *Lords of the Fallen.* [digital game]. Tokyo : Bandai Namco Entertainment, 2017.
40 HEART MACHINE: *Hyper Light Drifter.* [digital game]. Tokyo : Playism, 2016.
41 AURORA44: *Ashen.* [digital game]. Los Angeles, CA : Ananpurna Interactive, to be published in 2018.
42 THE GAME KITCHEN: *Blasphemous.* [digital game]. Sevilla : The Game Kitchen, to be published in 2018.
43 Remark by the author: During the time this article has been written (October 2018) Legend of Zelda: Ocarina of Time is on the first rank.; NINTENDO: *Legend of Zelda: Ocarina of Time*. [digital game]. Kyoto : Nintendo, 1998.

The 3D movies boom which started with Cameron's *Avatar*[44] started to vanish after a few years and from the supposed-to-be future technology, only a bitter taste remained. The audience simply lost its interest in this new technology and just wanted a good movie. In a similar fashion, a 4K resolution (soon 8K) and HDR technology are pushing its way into our living rooms. But then again, their automatic success should be taken lightly. The way the human eye is constructed cannot be fooled and all the new ultra-high resolutions and artificial smoothing of images somehow bring up complete opposite reactions among specific parts of the audience. The so-called *soap-opera effect*[45] is but one of the many problems, although it can be turned off. The higher resolution of the image is rather a technological excuse for further pushing of the limits, but we barely bear in mind the ratio between our distance from TV and our ability to actually appreciate this kind of resolution. Of course, we wouldn't like to be those with torches and forks in our hands, calling for the end of all technologies. But the point is that as long as the movie is bad, not even 8K resolution is going to save its qualities, not mentioning the fact that most people nowadays have virtually no problem watching their favourite movies on a small screen of a notebook or even a smartphone. This is exactly the problem T. Walker mentions in the abovementionedarticle when he says that graphics play an important role in the initial appeal of a game and less of a role once a player has become familiar with the game.[46] We can similarly perceive the phenomenon of remakes of different digital games, which often get very mixed reactions. A recent example of this is *Shadow of the Colossus*,[47] which was originally released for PlayStation 2 in 2005 and at its time proved that digital games definitely can be considered as art. Now, after the complete reworking of graphics for PlayStation 4, we can assert that the new version indeed looks remarkable, but has paradoxically lost a great deal of the original atmosphere.

During her TedX presentation from 2012, professor and neuro-cognitive scientist D. Bavelier from Geneva University demonstrated how the players of 3D action games (or "shooters" if you will) have better sight on several levels compared to other people or non-gamers. Their ability to distinguish little details is better (for example, they have fewer problems with reading very small letters) and they also can separate many more shades of the colour grey. Also, they exhibited better and more effective reactions in experiments dealing with focus and differentiating between written words and their meanings. When meditating over the properties of binaural sound, F. Rumsey and T. McCormick claim that some people are better at localizing sound than others, and that the HRTFs (Head-related Transfer Function, in simple words the ability and response of the human ear to capture and locate a specific sound in space) of so-called "good localizers" can be used in preference to those of "poor localizers".[48] When listening binaurally, the auditory events are less spatially *blurred* than in the monoaural case. For instance, two auditory events that are only 1° apart in azimuth can be discriminated binaurally for frontal sound incidence, while in monoaural listening the respective localization blur is at least 10 times larger. A higher spatial distinction in the binaural case also holds for elevation and distance. Further, in binaural hearing, the spatial extent of auditory events is more clearly defined, that is, there is a clear distinction between spatially compact and spatially diffuse ones.[49]

44 CAMERON, J. (Director): *Avatar.* [DVD]. Los Angeles : Twentieth Century Fox Film Corporation, 2009.
45 Remark by the author: Latest TVs have an image-smoothing option, which actually causes all the movies (even the big blockbusters) look like they were filmed before 2000 with a handy-recorder.
46 *QOTW: How Important Are Graphics to Games?.* Released on 26th June 2001. [online]. [2018-10-10]. Available at: <https://www.gamespot.com/articles/qotw-how-important-are-graphics-to-games/1100-2693475/>.
47 BLUEPOINT GAMES: *Shadow of the Colossus.* [digital game]. San Mateo, CA : Sony Computer Entertainment, 2018.
48 RUMSEY, F., MCCORMICK, T.: *Sound and Recording*. Oxford : Focal Press, 2009, p. 484.
49 KOHLRAUSCH, A., BRAASCH, J., KOLOSSA, D., BLAUERT, J.: *The Technology of Binaural Listening*. Heidelberg : Springer, 2013, p. 2.

We assume that this greater focus on the auditive aspects of digital games could lead to similar positive effects on players among other things. Many of these effects cannot be observed yet, because game audio is just on its rise and most of the research has been focused primarily on the visual aspects of digital games. There is also a slight chance that players could possibly get to a point in the (near) future when they are oversaturated by visual aspects of games (which could be indicated by a recent return of pixel-art graphics) in a similar fashion to film audiences in the context of certain genres and stereotypes. It is, therefore, appropriate to start contemplating how the new processes ingame audio could be used not just as a new formal approach, but as a teaching aid or a practice used for improving some of our senses (as D. Bevelier's experiments show us). Game audio offers many unexplored territories, which could bear not only a great deal of creative potential but also offer a space for the new and potentially positive effects of digital games on our senses and abilities.

Conclusion

The main goal of this paper was to lay out an idea that the auditive aspect of digital games presents so far unexploited possibilities which spread out on many levels. The first one and easily the one that is the most understandable resides in the large number of opportunities offered by audio on the level of creativity. Whether it is an aesthetics factor resulting from the physical properties of binaural and ambisonic sound, or in the number of ways that we can use its features as a conceptual element in an original digital game. The second level exists as a simple contrast between graphic design and game audio in the context of how these two behave within the frame of technological evolution and its perception by players/audiences. It is apparent that this topic is much more complex and it is hard to seize it in one small study, nevertheless, it is possible to argue that constant shifts of the visual aspects of digital games can be interpreted as secondary. Based on this argument,on the contrary, we can prove that audio has all the prerequisites to be the next "next-gen". Another level presents the possibilities of how game audio could actually improve different abilities of players. Based on the examples with graphics and gameplay being able to stimulate players to improve their sight, and based on similar experiments with human's ability to localize sounds in space, we assume that the more the auditive elements of digital games are going to be innovated and teamed up with new technologies, the more of the (positive) effects on players we will be able to observe.

Last but not least, the auditive element of digital games also offers space for exceeding the borders of a game's world. The example of Hellblade: Senua's Sacrifice shows us, how even a small team of game makers managed to raise awareness of psychosis and hallucinations using the binaural recording technique. There is no doubt that there is going to be many more attempts like this in the future and it is only a question of technology as to how these attempts are going to be executed. Nowadays different companies are trying to create fully 360-degree sound using speakers on a consumer level, which simply means that binaural and ambisonic sound will soon not only be the domain of headphones and VR. Perfectly immersive sound could be the next standard. With the help of artificial intelligence (taking care of localizing a person in an exact position in the room), this feature could mean the next step (not only) in the world of digital games, changing the way of working with narrative, gameplay, difficulty or space.

We don't say that there have been no games using similar concepts before. For instance, the auditive element has been recently very important in horror digital games (not only as an aesthetical element but as one of the primary game concepts – we can observe this in the games like *Outlast*,[50] *Amnesia: The Dark Descent*,[51] *Soma*,[52] on a large scale in *Alien: Isolation*[53] or the online game *Dead by Daylight*[54]) and in many action games. The player has to be aware of sound clues in digital games like *Splinter Cell*[55] or even *Counter-Strike*.[56] In the online game *PlayerUnknown's Battlegrounds*[57] one shot of a gun can reveal a player's position. We could thus say that audio (if we don't take into consideration the sound design as such) has been so far used mostly as an aspect determining the survival or localization of a player and/or enemy. We suggest that localization of whichever digital game object in space (or game world) is only the first of the many possibilities which are offered by the fully incorporated use of game audio. It is obvious of course that the visual elements of digital games haven't had their "last words" either. With the coming of technologies like *ray tracing* or pushing the limits of virtual and augmented reality, anything could be possible- but as we suggested in a previous chapter, game concept and gameplay always tend to outweigh the priorities of players, even though the initial experience with perfect graphics can be intense.

Even though this study is trying to present a rational argumentation, it also recognises the unpredictability of the market and of player's expectations or needs. It assumes though that the auditive element of digital games is one of the aspects which will expand in the near future and which will draw more and more attention from the player audience – not just on the level of sound effects or background but on the level of something that is changing the whole concept of digital games.

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50 RED BARRELS: *Outlast.* [digital game]. Quebec : Red Barrels, 2013.
51 FRICTIONAL GAMES: *Amnesia: The Dark Descent.* [digital game]. Helsingborg : Frictional Games, 2010.
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Digital Games as a Cultural Phenomenon: A Brief History and Current State

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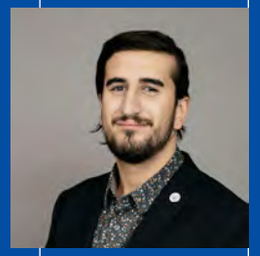

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ABSTRACT:
Digital games are one of the biggest cultural phenomenon of our time. From the first primitive devices, throught milestones of age, which inherited cultural status, to the newest technology – every part has its own meaning and proves that humans are playful creatures. But in digital games lies much greater potential, which can be used outside of the gaming industry, because games have an irredeemable place in the majority of the population. In current times we can even talk about gaming society and the author of this overview study sees his goal to process the historical development of digital games, analyse its current state and therefore this study could serve as the theoretical framework for further exploration, such as the future development of this area.

KEY WORDS:
arcade games, digital games, game industry, history, portable consoles.

Introduction

Digital games are part of our everyday life. It is the world's newest and fastest-growing mass medium. They have come a long way from the first attempts to create electronic gaming devices to the latest technologies, such as virtual reality. As with television or radio, development has been conditioned by both technological and social developments. The market in which digital games operate is global, stabilized, but also prone to changes and falls, the evidence of which are events from the past that have completely changed the face of the gaming industry. It is therefore necessary to know the historical development of digital games in order to find their place in society and to make the most of their potential. Game society is a reality of today, and with new trends as well as new generations, this connection between man and technology will be increasing. Only by understanding the true social significance of digital games can we analyze the current state as well as anticipate future developments. Whether it is the establishment of digital games as regular sports, the application of digital games into active youth education, or looking for potential and developing the physical, physiological and mental fitness of players using new technologies.

The main objective of this overview study will be to analyze historical developments, find the key moments and milestones that have affected the development of digital games and their industry up to their present shape. Later, thanks to the facts acquired, there will be space for identifying the key technologies of the present, looking analytically at contemporary time, avoiding mistakes of the past that brought the gaming industry to the brink of collapse. Last but not least, we will determine exactly the place of digital games in society, who plays, what is currently played and why. These facts could be used as the theoretical framework for further research focused on development digital games and the games industry. This young medium has an incredible potential as, unlike print or radio, it can communicate with the recipient on many levels, develop exponentially, and use direct interaction.

The Origin of Digital Games and First Milestones

Early history and the first attempts at development date back to the 1940s. Technological progress was a significant part of development. Although we cannot yet talk about games as we know them today, as it took more than a decade until they found their way to the general public. Similarly, like any new technology, games development was accompanied by an interest of a narrow group of inventors. The first technologies included, for example, electric discharge tubes that appeared on a monitor. However, from the point of view of the development of the gaming industry, this invention cannot be considered as technological, since it was never presented to the public and was rather a technological breakthrough. The first technologies were mostly presented at scientific exhibitions, and gradually, games paved their way to people. "Almost two decades before the first video game found its way into anarcade, the Canadian National Exhibition hosted a strange electronic device with a brightly lit scoreboard. It read: 'computer brain' versus 'human brain'".[1] We were in 1950 and this device was called Bertie the Brain. He called visitors to a classic noughts-and-crosses competition. Despite the pilot attempts, however, digital games in their first decade of development did not reach significant success. However, scientists who saw the potential seized these foundations, and during the 1960s, the first major steps were taken that led to the expansion of games to a world-wide popular medium as we know it today. The environment in which games originated was either academic or governmental. Developments were divided into three categories – simulators and training devices (e.g. for military or sports purposes), artificial intelligence research, and for entertainment of the public.

The academic environment has provided room for a good foundation for the creation of games that primarily do not only serve as a simulator or a training device. The first major game that was partly made by students themselves is *Spacewar!*.[2] The author of Spacewar! claims that although his game was not the first there are still reasons why his game was a breakthrough: "Two interactive programs existed before Spacewar, in which you interacted with switches on the computer and you changed a display on the screen, depending on what you did with the switches. But they weren't particularly designed as games. And they weren't very popular because, as games, they weren't very good".[3] Only in the case of Spacewar! can we talk about the first relatively widespread game. Relatively because this technology was still too new and so instead of the general public, we would rather think of a narrow group of enthusiasts, academics and scientists. However, Spacewar! already had interesting aspects thanks to which it was not only a simple simulator. In the game, two players played off against one another and fought with a spaceship. In addition to fighting with one another, the players had to fight against time, as the fuel of the ship was exhaustible, and in addition, the basics of gravity or a magnetic field were already used in this game. Spacewar! brought the basics of theory into practice, and its creators have significantly participated in forming the cornerstones in the creation of digital games as such. With this pioneering project, the door opened up and in the new decade, new technology was on the rise.

1 BATEMAN, CH.: *Meet Bertie the Brain, the world's first arcade game, built in Toronto.* Released on 13th August 2014. [online]. [2018-02-05]. Available at: <http://spacing.ca/toronto/2014/08/13/meet-bertie-brain-worlds-first-arcade-game-built-toronto/>.
2 RUSSEL, S.: *Spacewar!*. [digital game]. Cambridge, MA : Steve Russel, 1962.
3 KENT, S.: *The Ultimate History of Video Games*. New York : Three River Press, 2001, p. 15.

However, except Spacewar!, one more important milestone must be mentioned. As the opportunities for using computers were gradually expanding, J. Kemeny and T. Kurtz created one of the first universal coding languages – *BASIC* (Beginner's All-purpose Symbolic Instruction Code) in 1964 at Dartmouth College. Kurtz previously worked on the development of the nuclear bomb and as an assistant of Albert Einstein.[4] It is clear, therefore, that since the introductory idea there were high hopes for BASIC. This language created a completely new platform, as it helped to bring ordinary people, students, enthusiasts and not just a specific group of computer engineers to coding and programming. Thanks to BASIC, the first simple sports, logic and other games began to spread among students and enthusiasts. These creations were still closed to the general public, and would rather become widely used on university computers, because at that time, hardware was incredibly expensive. However, it is an undoubted fact that these two inventions extremely shifted the utopian ideas of the commercial use of games closer to reality.

Commercialisation of Games, the Golden Era of Arcade Games

The 1970s marked the rapid emergence of new technologies. The development of microchips and transistors led to a significant drop in prices as well as a physical reduction in overall hardware. Of course, even very expensive household technologies became more affordable for smaller companies that were not afraid to invest in the new medium. The first attempts to transfer games to consumers' homes were still technologically far in the future, but the slot machine industry saw a great opportunity. It should be noted that already during this period, the first console that could be plugged into a regular TV receiver saw the light of day. "The father of video games, then, is Ralph Baer, who was the first to create games that used television sets as their display devices, and the creator of the first home game system, the Magnavox Odyssey, which appeared in 1972".[5] Graphics could show only 3 points and 1 line; however, even this did not prevent the creators from creating a racing or sports game. Magnavox proved that it was possible to bring the technology home, and so helped to shape the future direction of the gaming industry, but it still was not timely and appropriate. The console did not have significant commercial success, but there is no doubt that it was a leader. Also, Magnavox Odyssey was an inspiration for the pair, which soon kick-started the entire gaming industry.

Nolan Bushnell and Ted Dabney, who together founded the Atari company, embarked on their own project after having been fascinated by the Magnavox. They hired Allan Alcorn, who had previous experience, as he also studied computer engineering and asked him to create a new game. However, for Alcorn it was a great step as he had never created any game before, and so Bushnell asked him to create something simple, in principle a testing version, and Alcorn came up with table tennis.[6] Alcorn created a coin-operated

4 MARCONI, A.: *History of Basic*. [online]. [2018-02-11]. Available at: <http://www.q7basic.org/History%20of%20BASIC.pdf>.
5 WOLF, M. J. P.: What is a video game? In WOLF, M. J. P. (ed.): *Video Game Explosion.* Westport : Greenwood Press, 2008, p. 5.
6 LOOWOOD, H.: Video Games in Computer Science: The Complex History of Pong. In *IEEE Annals of the History of Computing*, 2009, Vol. 31, No. 3, p. 13.

slot machine with a new game – *Pong*.[7] The heads of Atari were extremely satisfied with the result and decided to place Pong directly on the market. Pong spread very quickly and increased the popularity of the new phenomenon of spending leisure time. In 1973, approximately 70,000 devices were sold, although exact numbers of true Pong are unclear, as the device was taken over by many other companies which produced its mutation. But the Atari numbers are clear. In 1972, the original founders Bushnell and Dabney invested 500 USD (250 each) into the company at its establishment. Later, Atari grew into a company with an annual turnover of 2 billion USD, thus becoming the fastest-growing company in the USA at that time.[8] In the 1970s, games had a breakthrough and became a huge phenomenon. The great success of Pong helped to create the gaming industry on multiple levels. JulesMillman came up with an idea to get arcade games into shopping centres.[9] He created a model of the first arcade gambling dens where employees watched the running and behaviour of the players, parents could do their shopping with total confidence while their children were having fun. Other entrepreneurs adapted Millman's idea, and so arcade games and gambling dens provided for this purpose virtually became part of business centers in the 1970s in the USA. Startup companies were not idle and invested their profits in the development of new games. They primarily concentrated on racing and other interactive games – e.g. *Tank* by Atari,[10] or *Gun Fight*[11] by Midway. The latter company played an important role also for another reason. In the USA, it supplied the market with re-made games licensed by Taito. This is how Japanese games started to be distributed in the USA. GunFight was the first arcade game to run through a microprocessor, which again opened up completely new possibilities. The co-operation of Taito and Midway fell apart in 1979, since Taito earned so much money that it could open its own branches and distribution networks in the USA.[12] Games became a new phenomenon mainly for new generations. It was certainly the situation in the USA that led to this – the more relaxed 1970s, the insurgency against the Vietnam War, the hippy movement and others. The games began to be implemented into society so much that they gave rise to the initial gaming theories. For example the game *Death Race*,[13] which was the first game to raise questions on violence in digital games and its impact on players themselves.

At the end of the 1970s, much more developed games appeared in the market and obtained literally cult status. Games such as *Asteroids*[14] – the most successful game by Atari, *Pac-Man*[15] and, of course, the game *Space Invaders*[16] – considered as the first really massively successful game. This period, often referred to as the golden era of arcade games, finally commercialized games and attracted the general public. With the arrival of Space Invaders, games became so popular that in the USA, in addition to shopping centers, they could be found virtually everywhere – in shops with spirit drinks, petrol stations, airports, and, in a rather bizarre way, also in undertakers.[17] In the golden age, experiments with pseudo-3D imagery and the vector graphic rather the raster graphic began to be explored, resulting in a further technological advance. However, due to the expensive development and especially the costly repair of devices, games with simpler raster graphics were still dominant at the end of the 1970s. Digital games were implemented in society and became an integral part of pop culture. Leisure groups, interest groups, or even cults around the games emerged. The popularity of games moved beyond the other fields of art – films about games and players began to emerge – e.g. *Tron* (1982). The period, also known as the golden era of arcade games, was coming to an end. With such growing popularity, when games became virtually part of everyday life, it would not take long for games to get closer to consumers.

7 ATARI: *Pong*. [digital game]. Sunnyvale, CA : Atari, Inc., 1972.
8 KENT, S.: *The Ultimate History of Video Games*. New York : Three River Press, 2001, p. 38.
9 SMITH, K.: *Arcade Origins*. Released on 22nd March 2018. [online]. [2018-02-10]. Available at: <http://allincolorforaquarter.blogspot.sk/2013/03/arcade-origins.html>.
10 ATARI: *Tank*. [digital game]. Sunnyvale, CA : Atari, Inc., 1974.
11 TAITO: *Gun Fight*. [digital game]. Tokyo : Taito, 1975.
12 KENT, S.: *The Ultimate History of Video Games*. New York : Three River Press, 2001, p. 64.
13 EXIDY: *Death Race*. [digital game]. Sunnyvale, CA : Exidy, 1976.
14 ATARI: *Asteroids*. [digital game]. Sunnyvale, CA : Atari, Inc., 1979.
15 NAMCO: *Pac-Man*. [digital game]. Tokyo : Namco, 1980.
16 TAITO: *Space Invaders*. [digital game]. Tokyo : Taito, 1978.
17 KENT, S.: Super Mario Nation. In WOLF, M. J. P. (ed.): *The Medium of the Video Game*. Austin, TX : The University of Texas Press, 2002, p. 44.

First Portable Consoles and the Fall of the Market in 1983

The huge expansion confirmed the well-known business proverb - what goes up, must come down. The year 1983 was a disaster for the digital-gaming industry. Due to several factors, a huge fall, especially on the North American market, occurred. Over two years, nearly 97 % of companies' revenues fell due to saturation of the market, lack of graphics, and higher audience demands. This resulted in the disappearance or dissolution of many companies developing home consoles or computers. One of the factors was the emergence of third-party companies that did not create hardware, but flooded the market with games whose quality was clearly lagging behind.[18] Creators of digital games used massive marketing and created games inspired by blockbusters like *Indiana Jones – Raiders of the Lost Ark* (1981) or *E.T. the Extra-Terrestrial* (1982). However, the games had poor graphics, gameability, and had the opposite effect on the audience. While in the US, the gaming industry was on the brink of collapse, a new platform was set up in Japan to save it all. Popular at home and after the collapse of their partnership with Atari (as a result of the fall of 1983), the Japanese decided to go to the American and European markets themselves.[19] Nintendo launched its *Nintendo Entertainment System* (NES) that revived game console sales with its first-class graphics, fun content and modern design. It became an instant hit. We talk about the third generation of gaming systems, where NES clearly dominated. To compare, Atari brought a new 8-bit gaming system in the form of the Atari 7800 console – their sales are estimated at approx. 1 million pieces. Nintendo sold nearly 62 million pieces at that time. Over the next few years, NES spread to the whole world – the USA, Europe, Australia. Consoles enjoyed their renaissance, but Nintendo wanted to avoid a similar fall as Atari, and so they came up with a new business model. Instead of exclusive creation on their platform, they began to sign licenses with many third-party companies.

This resulted in a sufficient amount of quality content, and NES became a cult affair. The titles that NES brought to homes were so successful that they began their own extensive marketing - from clothing, movies, household accessories, toys, etc. Let us mention only the most well-known – *Super Mario Bros.*,[20] *Legends of Zelda*[21], or *Final Fantasy*.[22] The arrival of the NES clearly changed the gaming industry, helped it kick-start and brought a

18 ERNKVIST, M.: Down Many Times, but Still Playing the Game. In GRATZER, K., STIEFEL, D. (eds.): *History of Insolvency and Bankruptcy from an International Perspective*. Huddinge : Södertörns högskola, 2008, p. 185.
19 Ibidem, p. 186.
20 NINTENDO: *Super Mario Bros.* [digital game]. Kyoto : Nintendo, 1985.
21 NINTENDO: *Legends of Zelda.* [digital game]. Kyoto : Nintendo, 1986.
22 SQUARE: *Final Fantasy.* [digital game]. Tokyo : Square, 1987.

gaming revolution concerning consoles. However, reduced production costs and technological progress brought new capabilities to home computers. In 1982, the *Commodore 64* was released to the public and it was an immediate success. Programmed in BASIC, it offered advanced graphics for its time, using the same ports as the Atari 2600, thus allowing players to use old controllers. In Europe, the *Sinclair ZX Spectrum* became popular at that time, and the emergence of *IBM PC / AT* and *Apple Macintosh* was the undisputed milestone. Graphics development came in 1985, and the computers brought the first 16-bit graphics interface with greater resolution and high-quality sound. By popularizing computers and creating the first networks, the first attempts to play online can be dated back to this era.

Computer Boom and New Generations of Game Consoles

The 1990s can be labeled as a very innovative decade. The world of digital games became globally popular, games gradually began to move into 3D graphics, new game genres emerged that became extremely popular – *FPS* (first-person shooter), real-time strategy, or *MMO* (a massive multiplayer online game). Arcade games were markedly declining and an issue of history, games entered people's homes. The transition to 32- and 64-bit graphics brought new possibilities for using 3D texture mapping to open up completely new possibilities for digital gameability. Popular titles such as *Mortal Kombat*,[23] *Doom*,[24] or *Wolfenstein 3D*[25] became part of many households. The development and drop in prices of microprocessors opened the way for, in addition to the new generation of consoles, mainly computer gaming. The operating system by Microsoft – MS-DOS popularized gaming even more, as it was widely available at relatively low costs. In addition, in many countries there was no legislation and no distribution network, so the only option was piracy – which was practically not illegal, as no laws existed. In this period (the 1990s), games began to spread even among the narrow public in Slovakia. Due to the technical efficiency, especially textual adventures were being created in Slovakia – e.g. the game *Dokonalá Vražda*[26] by Ľ. Vittek, the founder of the first game distribution company in Slovakia, called Ultrasoft. "The distinction of Vittek's textual adventure not only lies in his later business activity but also in the fact that it is rather a controversial and sophisticated simulator of planning a successful murder where a player does not convey a specific fictional character but can play under his or her own name".[27]

In addition to computer games, the fourth generation of consoles also came on to the market. By popularizing CDs, games could finally have space for a bigger story and more complex graphics. The fifth generation of consoles returned the Atari company to the market, but again, it was overcome by an avalanche of Japanese competitors – *Nintendo 64* and in particular, the Sony company. In 1994, Sony launched the future of gaming consoles – *Sony PlayStation*. The first console in history, which surpassed the magical limit of 100 million pieces sold, became part of almost every household in the USA, also

23 MIDWAY: *Mortal Kombat.* [digital game]. Chicago, IL : Midway, 1992.
24 ID SOFTWARE: *Doom.* [digital game]. New York : GT Interactive, 1993.
25 ID SOFTWARE: *Wolfenstein 3D*. [digital game]. New York : GT Interactive, 1992.
26 ULTRASOFT: *Dokonalá Vražda.* [digital game]. Bratislava : Ultrasoft, 1987.
27 *Piráti a pionieri.* [online]. [2018-02-20]. Available at: <http://www.scd.sk/?muzeum-dizajnu-aktualne&sprava=pirati-a-pionieri>.

enjoyed enormous popularity in our country. In the 1990s, the availability of portable consoles was also expanding – more successful as well as unsuccessful projects were in the shadow of a single giant – Gameboy by Nintendo. These consoles, however, had an even lower battery life and a lower software quality; on the other hand, a possible direction for the gaming industry could be observed there. The Millennium break brought further technological advances, and online gaming was gradually coming to the fore.

The Contemporary Gaming Industry

The arrival of the new millennium again diversified the market, which has recently been steady. The global market is currently dominated by a narrow group of companies. Unlike the past, when game developers and developers of gaming devices – they were usually the same companies, the market is now very wide and filled with various third-party developers (companies that make software components without hardware). However, the current model has recently worked in such a way that the largest producers on the market are creating huge conglomerates that have a direct or indirect impact on developers (and third-party companies), in the form of various shares and other partnerships. The current state of affairs is particularly threatened by the pirate market with illegal copying of titles, especially in the segment of computer games. Microsoft and their console *Xbox One*, Sony with the console *PlayStation 4* and Nintendo with the console *Switch* dominate the market and are at the forefront in the last-generation console sales.[28] When talking about the segment of computer games, the most popular service nowadays is Steam – software founded in 1993 by the Valve company which manages and sells digital rights to multiplayer games. It is the biggest distribution service in the PC segment – it controls nearly 75 % of the market.[29]

In terms of the development and production of the content (of games), Sony InteractiveEntertainment – which buys other creative studios, empowers them and employs subsidiaries (such as Naughty Dog, Santa Monica Studio, or Bend Studio), occupies a leading position on the market. Another influential developer is the company Activision Blizzard (formed from two giga studios at the end of 2007 and the beginning of 2008). The company is behind popular titles such as *Call of Duty WWII*.,[30] *Destiny*,[31] or behind the most popular massive multiplayer online role-playing game (MMORPG) in the world – *World of Warcraft*.[32] The most successful „smaller" studio is still Rockstar Games, which, in contrast to its competitors, issues their original titles irregularly and over several years; but on the other hand, they care about great gaming opportunities, player freedom in narrative decision-making and technological breakthroughs, as reflected by the game *Grand Theft Auto V*[33] which became one of the best-selling games and only three days after its official release it exceeded the magic limit of 1 billion USD.[34]

28 *Global unit sales of current generation video games consoles from 2008 to 2017.* [online]. [2018-02-20]. Available at: <https://www.statista.com/statistics/276768/global-unit-sales-of-video-game-consoles/>.
29 EDWARDS, C.: *Valve Lines Up Console Partners in Challenge to Microsoft, Sony.* Released on 4th November 2013. [online]. [2018-02-20]. Available at: <https://www.bloomberg.com/news/articles/2013-11-04/valve-lines-up-console-partners-in-challenge-to-microsoft-sony>.
30 SLEDGEHAMMER GAMES: *Call of Duty WWII.* [digital game]. Santa Monica, CA : Activision, 2017.
31 BUNGIE: *Destiny.* [digital game]. Santa Monica, CA : Activision, 2014.
32 BLIZZARD ENTERTAINMENT: *World of Warcraft*. [digital game]. Irvine, CA : Blizzard Entertainment, 2004.
33 ROCKSTAR NORTH: *Grand Theft Auto V.* [digital game]. New York : Rockstar Games, 2013.
34 GOLDFARB, A.: *Gta 5 Sales Hit $1 Billion Dolllars in Three Days*. Released on 20th September 2013. [online].

Even now, five years since it was released, it still occupies the forefront of sales in particular due to its sophisticated online mode.[35] The preferences of players to explore new so-called indiegames (from 'independent') has become the popular trend of the present. Indiegames are games by smaller developers who do not belong to huge conglometares, do not have hundred-million dollar budgets for both development and marketing, yet they can still capture attention with creativity when creating gaming content and using non-standard models in gameability. However, the fact remains that the most popular titles come from the cult series which have been created by big studios for years (for a more detailed description, see Table 1).

Table 1: Best-selling game titles in 2017

Ranking	Name of the title	Developer	Original title (first in the series)
1.	Call of Duty: WWII	Activision	No
2.	Star Wars: Battlefront II	Electronic Arts DICE	No
3.	Super Mario Odyssey	Nintendo Entertainment	No
4.	NBA 2K18	2K Games	No
5.	Mario Kart 8	Nintendo Entertainment	No
6.	Madden NFL 18	Electronic Arts Sports	No
7.	PlayerUnknown's Battlegrounds	Microsoft Studios	Yes
8.	Assassin's Creed: Origins	Ubisoft	No
9.	The Legend of Zelda: BotW	Nintendo Entertainment	No
10.	Grand Theft Auto V	Rockstar Games	No

Source: KAIN, E.: *The Best-Selling Video Games of 2017.* Released on 19th January 2018. [online]. [2018-02-21]. Available at: <https://www.forbes.com/sites/erikkain/2018/01/19/the-best-selling-video-games-of-2017/#ea839a862260>.

The latest trend that does not have such a long historical base as arcade or console games is undoubtedly mobile games. The first known mobile game is the modification of the popular *Tetris*[36] from 1994. Three years later, the Nokia company launched the game *Snake*[37]– its original title as well as later modifications were installed on more than 350 million devices.[38] Nowadays, with advanced technologies and the emergence of smartphones, mobile games have been more and more popular. The most important distribution platforms are, of course, public Internet shops available via smartphones – for Apple, it is Appstore, for Android – Google Play. In addition to user applications, it is possible to download a game into a smartphone for free or for a fee. The reasons for popularity are obvious – the easy access and the use of hardware without external keyboards or monitors virtually anywhere. Historically, games created for portable game consoles (Gameboy, and others) can be considered as predecessors of mobile games, but the portable consoles themselves suffered from a number of drawbacks – poor performance, battery life, etc. Mobile games as part of smartphones have become an inseparable part of spending leisure time of the wider public.[39] Unlike sophisticated game stories, the most popular games build upon interaction with the player, often the story itself is absent. Another significant difference is that even though bigger developers are involved in this segment, a number of mobile games come from small teams, startups, or people for whom development is a hobby. In order to understand the dynamics of this market, it is worth mentioning the fact that many games are offered for free in virtual stores, but they contain a lot of advertising, which provides the main revenue from each game. Another form of making profits is so-called *freemium*. It is a business model in which the player has the option of installing the game for free, but the game mode may be limited or time-limited. Due to poor control, this model is very dangerous especially for juvenile users as it directly lures them into financial transactions, which can evoke the type of gambling that is a criminal offence for minors. The model of distribution, sales and use of mobile games is different from that of digital games, but we still talk about a huge market. Additionally, if a game becomes popular enough, it can be recycled into other segments (pc gaming, consoles, movies, clothing, etc.). A good example of this is the game *Angry Birds*[40] which originated from the Finnish startup Rovio. A small independent company created the game, so to speak, on a shoestring in 2003.[41] After gaining worldwide popularity, its price grew to astronomical heights. The real value of the product is hard to estimate, but the indicative fact may be that in 2017, the Rovio chairmen refused to sell the brand name Angry Birds to Zynga company for 2.25 billion USD.[42] Since the original title was released, the game has had dozens of new versions, a movie and an extremely large number of other products.

To illustrate the popularity of mobile games and how high their profits are, table 2 is provided, where the profits of the top 10 mobile games which are available for free but contain in-app transactions, are indicated. This table shows the transactions made in the game within 24 hours. The games in the table are for the Apple – iPhone smartphones platform and only for the US market. It follows that global earnings on both major platforms (iOS + Android) may be ten to hundred times higher.

Among mobile games, another contemporary trend is the rising popularity of electronic sports. Digital games became a spectator sport. eSports are a form of using digital games for competitive purposes. Early games were created as a form of competition and the later genre differentiation shifted these options even further. Sports, racing, strategic and other games were created which challenged players to pit their abilities not only against artificial intelligence but also against one another. At the turn of the millennium and with the emergence of the Internet, various amateur competitions took place; however, competitive rivalries have become a trend only relatively recently. At this point in time, games like the first-person action simulation *Counter-Strike*[43], or strategies *Defense*

[2018-02-20]. Available at: <http://www.ign.com/articles/2013/09/20/gta-5-sales-hit-1-billion-in-three-days>.

35 PEREIRA, CH.: *10 Best-Selling Games Of March 2018 In The US Revealed.* Released on 26th April 2018. [online]. [2018-02-21]. Available at: <https://www.gamespot.com/articles/10-best-selling-games-of-march-2018-in-the-us-reve/1100-6458491/>.

36 PAJITNOV, A.: *Tetris.* [digital game]. Moscow : Dorodnitsyn Computing Centre, 1984.

37 NOKIA: *Snake.* [digital game]. Espoo : Nokia, 1997.

38 GOGGIN, G.: *Global Mobile Media.* Milton Park : Routledge, 2010, p. 101.

39 DUNN, J.:, *Smartphone addiction 'seems to only be getting stronger.* Released on 25th May 2017. [online]. [2018-02-25]. Available at: <http://www.businessinsider.com/people-spending-more-time-on-smartphones-chart-2017-5>.

40 ROVIO: *Angry Birds.* [digital game]. Helsinki : Rovio Entertainment, 2015.

41 BASHIR, D.: *The History of Angry Birds.* Released on 6th October 2017. [online]. [2018-02-25]. Available at: <https://gamehubs.com/article.php?id=the-history-of-angry-birds>.

42 NARCISSE, E.: *Zynga's Two-Billion-Dollar Bid Wasn't Enough to Buy Angry Birds*. Released on 17th April 2012. [online]. [2018-02-25]. Available at: <https://kotaku.com/5902714/zyngas-two-billion-dollar-bid-wasnt-enough-to-buy-angry-birds>.

43 VALVE: *Counter-Strike.* [digital game]. Bellevue, WA : Sierra Studios, 2000.

of the Ancients[44] (DotA) and *StarCraft*[45] have been massively played at tournaments all over the world. The largest market and audience share is in Asia, but eSports are also very popular in the USA, or in Slovakia and generally in Europe.[46] The final of one of the world's largest tournaments took place in 2017 in neighbouring Poland: Intel Extreme Masters in Katowice and the tournament was visited by 173,000 spectators.[47] Electronic sports have been gaining popularity especially among the younger generation that watches players via streaming services such as Twitch or Youtube channels. It is therefore more likely that this new phenomenon will continue to grow. The eSport market has exceeded a 5 billion USD earnings limit in 2017. For comparison, NHL (National Hockey League – the most popular ice hockey association) earned 3.7 billion USD.[48]

Table 2: Profits of top 10 mobile games within 24 hours (only iOS)

Ranking	Game	Developer	Profit for 24 hours (USD)
1.	Pokémon GO	Niantic, Inc.	1,642,725
2.	Candy Crash Saga	King	1,269,269
3.	Clash Royale	Supercell	973,403
4.	Final Fantasy XV: A New Empire	Epic Actionllc	665,748
5.	ROBLOX	Roblox Corporation	645,776
6.	Candy Crush Soda Saga	King	571,096
7.	Homescapes	Playrix Games	300,932
8.	Slotomania: Vegas Slot Casino	Playtika Ltd	290,335
9.	Toy Blast	Peak Games	277,454
10.	Toon Blast	Peak Games	242,639

Source: Top Gorssing iPhone – Games United States. [online]. [2018-02-26]. Available at: <https://thinkgaming.com/app-sales-data/>.

Another big trend is the implementation of augmented and virtual reality into the user interface. In recent years, developments have shifted forward, but the enormous potential is yet to come with advances in science. One of the most important arguments of people who are not supporters of digital games can thus completely disappear. Lack of physical activity has a proven impact on the health of the population and, of course, players who spend most of their free time playing. However, with the emergence of virtual reality, players can penetrate the fictional world of digital games and use more than just motor skills. There are many research studies that already confirm for developers of games with augmented reality the improvement of motion habits of younger generations. For example, the mobile game *Pokémon GO*[49] in which a player uses augmented reality must use his or her smartphone to physically move to locations to catch Pokemons to score points and progress in the game. A study conducted at Stanford University states that, thanks to Pokémon GO's play, the number of steps of the examined sample increased on average by 1 473 steps a day.[50] There are, of course, still many questions that need to be answered. Needless to say, contemporary trends such as eSports and VR are so broad and important in game studies, that we believe they deserve research studies on their own.

44 BLIZZARD ENTERTAINMENT: *Defense of the Ancients*. [digital game]. Irvine, CA : Blizzard Entertainment, 2003.
45 BLIZZARD ENTERTAINMENT: *StarCraft*. [digital game]. Irvine, CA : Blizzard Entertainment, 1998.
46 VAN DITMARSCH, J.: *Video Games as a Spectator Sports*. Released on 18th November 2013. [online]. [2018-02-11]. Available at: <https://dspace.library.uu.nl/bitstream/handle/1874/288162/Video%20Games%20as%20a%20Spectator%20Sport%20-%20JL%20van%20Ditmarsch.pdf?sequence=2&isAllowed=y>.
47 KSIĄŻEK, P.: *IEM w Katowicach odwiedziło 173 000 fanów*. Released on 16th March 2017. [online]. [2018-02-10]. Available at: <http://cybersport.pl/86363/iem-katowicach-odwiedzilo-173-000-fanow-infografika/>.
48 PARADISE, A.: *The history behind a $5 billion eSports industry*. 2016. [online]. [2018-02-10]. Available at: <https://techcrunch.com/gallery/the-history-behind-a-5-billion-esports-industry/>.

Conclusion

Digital games are one of the fastest growing media. Over a couple of decades, the first primitive attempts to create entertainment have been transformed into a fully-fledged, powerful medium, and a sector that has a several billion dollar turnover each year. Literally from day to day, innovations appear, shifting forward the boundaries of this segment more and more. What could not be done yesterday can be done tomorrow. Few cultural phenomena have so quickly established themselves in society. The development, exploitation and popularity of games are given by social standards but, of course, conditioned by technological progress. It is therefore necessary to know in detail how the market evolved and behaved in the past, to carefully analyze the moments when digital games almost ended up in the dustbin of history, to search for causes and consequences. Only in this way can we properly analyze the societal place of digital games today. Thanks to the detailed knowledge of the past, we can apply digital games and game studios into today's company; look for positives and negatives and exploit the maximum potential that is hidden in this new media. Even social sciences have a place in analyzing digital games and their consumers, as digital games create completely new worlds, but often using mechanisms of our reality. Therefore, the social consequences of the players' actions in the virtual world should not be forgotten, whether it is mutual communication, attitude to violence, racism, xenophobia, or other negative phenomena of our society. Games are and can be a very powerful communication tool that has penetrated our culture in a global manner, and it is only up to society to ensure that they are used correctly, rationally and responsibly.

As with the whole online environment, digital games also create new social discourses that need to be thoroughly analyzed. In addition to examining the current state of the art, the development of digital games in the future should be explored and predicted since, as has already been pointed out, games are linked to technological progress that is growing by leaps in the information segment every day.

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THE ISSUE OF SLOVAK DIGITAL-GAMES' MUSEOLOGY

Interview with Maroš BROJO

Nikola Kaňuková (N. K.): Try to explain the reason for the creation of the design museum and its content.

Maroš Brojo: The Slovak Design Museum (SMD) was established under the Slovak Design Center several years ago with the goal of mapping various forms of Slovak design throughout the 20th and 21st centuries. While we already had well established museums dedicated to Slovak art it is also a common practice to have a design museum and we were still missing one in Slovakia. Creating the SMD finally managed to change this and we finally have the opportunity to have an institution that systematically collects, preserves and researches our design. Similar to art, design is a very broad term that represents a lot of very different areas like product design, textiles and fashion, materials, multimedia or communication design. Thus the museum collects and researches a lot of very different things like clothing, posters, illustrations, furniture, electronics, objects of day to day use, multimedia, car designs etc. under various specialized collections.

N. K.: Can we find digital games there? Which ones?

Maroš Brojo: There is also a sub-collection focused on digital games and game design under the multimedia design collection. We are not really interested in anything apart from digital games (yet). The main reason why we decided to start working on digital games is that digital content can get lost fairly easily and it's much harder to preserve it than to preserve physical things. So we are under quite a lot of pressure to collect as many games as soon as possible because they might be lost forever in 10 – 20 years. We do not focus on games outside of Slovakia because we believe that every country should have institutions for managing their own cultural heritage and we have enough work with our own. So for now and also probably in the future we only focus on collecting Slovak and Czechoslovak games.

N. K.: How does the museum cover the area of digital games?

Maroš Brojo: Researching, archiving and preserving digital games is a big challenge and every institution around the world is doing it differently. There are no unified guidelines or examples of long term work that we can just copy and apply to our institution. Accepting digital games as part of our cultural heritage is only a matter of the last ten or so years. With this in mind every institution has to figure this out mainly by itself. Since my area of expertise is film studies where these kind of initiatives are already well established, this is where we began. Looking at how you not only preserve films but also documentation and everything around them is a good starting point. A lot of institutions all around the world were mainly focussed on this before starting their work with games. So what we try to do is to cover games as a complex phenomenon. It's not our goal to only collect copies or game files but we try to collect everything. So as part of the collection you will also find metadata, posters, cover art, pirated copies, interviews with developers, source codes, gameplay videos, reviews, magazine scans etc. When you manage to collect all of this you should hopefully be able to piece together a complex picture of a specific time period, the wider context of a game being developed the way it was or overall professional and gamer perceptions of said game. Our ultimate goal is to gather and catalogue as many games as possible and to sort out and organize all the materials and information around them. This should enable researchers in the future to have a central information and resource hub to be able to write partial studies or a complete history of Slovak games and game development.

N. K.: Percentually, what part of Slovak digital-gaming history is currently covered by the Slovak Museum of Design?

Maroš Brojo: We are building the most complete database of Slovak games which currently has more than 250 entries but we expect this number to rise to more than 400 in the future. Each entry has more than 30 types of metadata. This alone is a lot of work but is necessary as an anchor for further research. Filling out all the metadata alone will take several years but if we manage to do this we will have sufficient information to know most of the game developers and will be able to contact them. This will lead to gathering more detailed information and materials for a lot of these games. So by means of maintaining evidence of Slovak games I would say that we have at least an idea of around 60 – 70 percent of existing games and the rest are missing. These are not necessarily the oldest ones but can be casual games made by one or two companies that thrived in the flash games era or a lot of them can be games made for dumb phones on the Java platform that were forgotten with the rise of smartphones. When it comes to physical materials, documentation, official copies, interviews and let's play videos we are still at the beginning.

N. K.: As this issue is solved only partially and rather regionally, the most fundamental question is: Can digital games be considered as works of art?

Maroš Brojo: I think that every gamer with a deeper understanding of this medium will be able to identify artistic tendencies in specific games and can even differentiate between games made purely for fun and games that convey a deeper message or aesthetical value. I myself stopped asking this question and decided to not fight for the recognition of games as art. I think that games as a medium can be messengers of all the ideas, feelings and experiences that can be communicated through film, literature, theatre and other art forms. And all of these games also communicate them in specific ways that not a lot of other media can (like interactivity). As for people that need persuading I think it's actually easier just to show specific examples. This leads to a faster understanding. But you can also take a longer route. Take a specific artform (like film, literature or theatre) and by means of finding analogies in their theoretical studies and history you can basically demonstrate that games are developing the same way (from entertainment, through wild experimentation to a more established form of art with its own specific language and tendencies).

N. K.: What is the importance of the digital games' museology in global?

Maroš Brojo: Games are simply put part of our cultural heritage. It doesn't matter if they are accepted as art or not. They have become such a huge phenomenon and such a big part of many people's lives that they deserve the attention of many institutions around

the world. As with any part of our culture games can help understand previous generations, subcultures and the cultural and sociological tendencies of a specific time period. So they are a great tool for further research that doesn't even have to revolve directly around them. I think that several perceived values of games (cultural heritage, sociological research tool and a new artform) is what drives museums and archives to more and more activities connected to games. From the history of film we have also learned that it is much wiser to start documenting, archiving and researching a medium sooner rather than later so nothing important gets lost. I believe that many institutions realize this and with this medium being natively digital we have to be much more careful. We will not be able to save a game that has been lying somewhere in a box for 30 years on a diskette or CD.

N. K.: What challenges do digital games' museology bring to our region?

Maroš Brojo: I think that the biggest challenge is still to be widely accepted as a relevant museological subject of research. While we have started doing it in Slovakia other countries in our region are a bit slower. But I believe that all of them will slowly come to the conclusion that it is necessary and will start to approach already-existing fan-based and private initiatives and collectors. We can be lucky that there is big retrogaming community all around the world that has already done a ton of work for us. Hopefully Slovakia and our activities will serve them as a good example.

N. K.: From a museological point of view, which Slovak games and gaming devices are the most valuable?

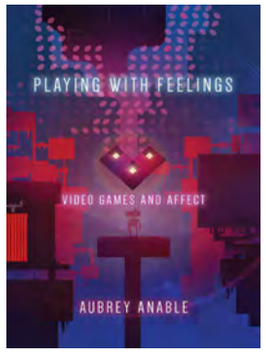
Maroš Brojo: We have a very exciting and fascinating history of personal computing in Slovakia since we were manufacturing our own hardware before the revolution. The PMD-85 engineered by Roman Kišš was our first personal computer and people were already making games for it in Czechoslovakia. This is basically a period that represents the beginning of our game development. The PMD-85 was being sold from 1984. After the PMD-85 came the well-known and popular Didaktik Gama and Didaktik M PCs that were compatible with the ZX Spectrum and were owned by thousands of people from Slovakia in the 80s and 90s. Thanks to these computers and the ZX Spectrum platform we have a very rich heritage of around 30 early games. As for games it's still hard to determine which ones were historically the most important since we don't know a lot about some of them. But for those that we do know we have games like Šatochin by Stanislav Hrda, Perfect Murder by Ľudovít Wittek or Quadrax by Caldron studio just to name a few of the early ones. I could name a few more examples from the later 90s era but we are still piecing together the whole context.

N. K.: Do current trends, retro-gaming and emulation, have a positive or negative impact on digital games' museology?

Maroš Brojo: The retrogaming community are actually the first historians and archivists of digital games. If it wasn't for them we would have lost a lot of games. These people were creating databases and collecting games much sooner than any professional historian or museologist. We are just continuing or expanding their work. Emulation is an extremely useful tool for us because a lot of the hardware will gradually stop working and we will not have enough resources to fix it in the future. So we will necessarily have to rely on emulation in the future. In most cases it's also much easier to actually work with an emulator instead of using original hardware that can often be slow, faulty and unreliable. That is if you're not searching for something very specific that only original hardware can provide like the way some geometry is rendered on old CRT televisions. When doing an exhibition you can also approach it in two ways. You can present games on their original hardware which brings more authenticity to the experience but requires constant attention and maintenance during the exhibition, or you can use emulators and really focus just on the games while providing a more streamlined access to them.

Maroš Brojo

Maroš Brojo is the organizer of the annual event Fest Anča Game Days that introduces European digital games to the general public and provides space for game developers to meet together. He works for the Slovak Game Developers Association and he is the project coordinator of the New Talents promotional initiative at the Visegrad Animation Forum in the Czech Republic. As a curator he works at the Slovak Museum of Design, focusing on digital games and multimedia history, archiving and preservation. He is also a member of the Slovak Arts Council support program for multimedia and digital games.



PLAYING WITH FEELINGS: VIDEO GAMES and AFFECT[1]

ANABLE, A.: *Playing with feelings: video games and affect*. Minneapolis : University of Minnesota Press, 2018. 152 p. ISBN 978-1-517-90024-3.

Magdaléna Balážiková

Author Aubrey Anable is an assistant professor in the film studies department at Carleton University in Canada. She received a Ph.D. in Visual and Cultural Studies from the University of Rochester and her academic interests include digital culture with the emphasis on digital media aesthetics, theory of affect, film and media theory, urban studies, cultural studies with notions of feminist theory and queer culture, cybernetics, critical theory, gender and media technologies and experimental media.[2]

Throughout the text Anable is looking into the intersection of video games and affect theory. Even though the title may suggest a dive into the discipline of psychology, this book is far from a psychology textbook and closer to a complex critical text with notions of philosophy and cultural studies. It presents video games as affective systems and understands video games in a broader sense as a merge of aesthetics, narrative, code, image, sound, hardware, our internal concepts, other players, sociohistorical context and cultural meanings. Affect is understood as a term „culturally situated in relation to the gendering of the bodies and objects of mass-media culture"(p.100) representing „aspects of emotions, feelings, and bodily engagement that circulate through people and things but are often registered only at the interface" (p. xviii). In general, we have to take into consideration the impact of affect on our perception and preferences and its importance in creating what we do and don't like. In the context of affect theory the ideas of psychologist Silvan Tomkins, author of the affect theory itself, culturologist Raymond Williams or professor of Women's studies Elizabeth Wilson and many others are presented. Anable doesn't understand games as a new medium, but rather as historically, technologically and culturally grounded concept. Nonetheless, she considers proponents of gamification to be overly ambitious regarding cultural influence of games. The book is substantiated by a multitude of examples whilst author shifts focus from big-budget games towards indie games, casual games and art games. Since author considers herself a feminist, reader can encounter some discoursive turns towards feminist notions and remarks. As she said: "I seek to expand our understanding of the ways video games and game studies can participate in feminist and queer interventions in digital media culture"(p.xvii).Surely it is an interesting topic to explore, but it might seem slightly forced into the text sometimes.

In the first chapter, Anable aspires to change the presumption about women being historically invisible in the computer world. The feminist video game history is being illustrated on the video game *Kentucky Route Zero*.[3] Author is trying to debunk the impression that video game history is all about men. Furthermore within Kentucky Route Zero, she wanders into the topic of disorientation, humor and the term cybernetic fold (introduced by Eve Kostofsky Sedgwick and Adam Frank describing a historical period when "...scientists' understanding of the brain and other life processes is marked by the concept, the possibility, the imminence, of powerful computers, but the actual computational muscle of the new computers isn't available".[4]

In the second chapter with a double meaning title Touching games author examines how physical touch (e.g. swiping) can „touch" our feelings within a game and how body, screen and code are forming an affective circuit. The example of the game *Superbrothers: Sword and Sworcery EP*[5] illustrates the suppression of visual perception (a game with poor graphics) and pronounces a relevance of listening and touching that augment gaming experience. Hereby, the screen acts as a sensual surface functioning within a larger affective system, but the ability to feel and represent emotions is still tied to the interface. She notes that gestural manipulation on screen is considered as more intuitive than other types of digital interfaces. She further discusses one of game's cardinal qualities – game feel. She proposes that the term game affect is more precise. Later, she elaborates on the game called *The Empathy Machine*[6] that ask the player to put a hand on the screen even though it doesn't use a touchscreen technology. It can be seen as the critique of „fetishization of immersion in digital media" (p.48). The queer discourse is introduced within the example of *Dys4ia*[7] that translates feelings arising from gender transition into a game.

In chapter 3: Rhythms of Work and Play author analyses popular games (*Candy Crush Saga*,[8] *Plants vs. Zombies 2: It's about time*,[9] *Diner Dash*[10]) that make us 'work' in moments when we paradoxically yearn to escape from obligations, the boundaries between work and play are diminishing. Casual games (more precisely click management or time management games) are perceived as affective systems, a part of work culture and work rhythms providing what we are possibly lacking in our jobs: clear instructions, reward, identifiable outcomes, involvement and perhaps a little bit of fun. They serve as bridging activities and, most importantly, emotional mediators. As emotional mediators, according to Anable, they provide structures of feeling different from other types of games and media forms. While on the subject, she considers the genre of casual games to be neglected in terms of their significance(e.g. cultural)and she claims the reason for this neglect is the strong association of this genre with women. Chapter ends with the concept of 'zaniness' as one of the postmodern aesthetic categories (the zany, the cute, the interesting) elaborated in the work of Sianne Ngai. The category of zany applied to human production and working environment is humorous, playful, but at the same time dangerous, creating a feeling of losing control and frantic activity.[11]

1 The review is a partial output of the research project FPPV-27-2018 *Frustration as a motivating factor.*

2 *Aubrey Anable*. [online]. [2018-08-15]. Available at: <https://carleton.ca/filmstudies/people/aubrey-anable/> ; Compare to:.

3 CARDBOARD COMPUTER: *Kentucky Route Zero*. [digital game]. Chicago : Cardboard Computer, 2013.; *Kentucky Route Zero. A game in five acts by Cardboard Computer*. [online]. [2018-08-15]. Available at: <http://kentuckyroutezero.com/>.

4 KOSOFSKY SEDGWICK, E., FRANK, A.: *Shame and its sisters*. Durham : Duke U.P, 1995, p. 12.

5 CAPYBARA GAMES, SUPERBROTHERS: *Superbrothers: Sword and Sworcery EP*. [digital game]. Toronto : Capybara Games, 2011.

6 POZO, T. D.: The Trouble With 'Empathy Games': Queer Game Design as Haptic Media. In *Society for Cinema and Media Studies Annual Conference 2017. Conference Proceedings from International Scientific Conference 22nd – 26th March 2017*. Chicago, IL, 2017, p. 1-9. [online]. [2018-11-23]. Available at: <https://www.academia.edu/34622663/Pozo_Queer_Games_as_Haptic_Media_SCMS_2017>.

7 ANTROPHY, A.: *Dys4ia*. [digital game]. USA : Newgrounds, 2012.

8 KING: *Candy Crush Saga*. [digital game]. St Julian's : King, 2012.

9 POP CAP GAMES: *Plants vs. Zombies 2: It's about time*. [digital game]. Redwood City, CA : Electronic Arts, 2013.

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11 NGAI, S.: *Our Aesthetic Categories: Zany, Cute, Interesting*. Cambridge : Harvard University Press, 2012, p. 333.

The last chapter talks about video games that don't distract us from frustration of everyday life but rather actively create frustration. It embraces the aesthetics of failure characterized by low graphics, awkward controls or no control over the game whatsoever, games that seem primitive but are hard or even impossible to win, or games with unusual timeframes (ranging from one second up to years) Playing such games, our assumptions of how games should work are distorted. Because of that we are able to find new affective experience in places we expected to process automatically. Moreover, according to Anable, when confronted with aesthetics of failure we can better understand how to deal with real-life failures.

The book Playing with feelings is a reaction to the belief that these days the significance of narrative and images in games is suppressed and the emphasis is placed on code or action. Aubrey Anable insists that we cannot separate representation from computation. The style of the book is quite essayistic, but sufficiently supported by scholarly sources and rich in examples, although not so much in recommendations or practical implications. It offers a challenging multi-discursive reading and prompts reader to look past the most common interpretations of digital games and related contexts.

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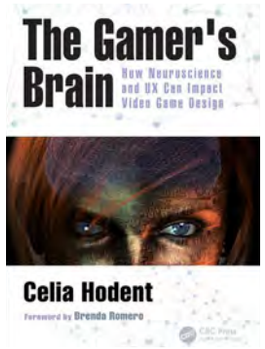

THE GAMER'S BRAIN: HOW NEUROSCIENCE AND UX CAN IMPACT VIDEO GAME DESIGN[1]

HODENT, C.: *The Gamer's Brain: How Neuroscience and UX Can Impact Video Game Design.* Boca Raton : CRC Press, Taylor & Francis Group, 2018. 250 p. ISBN 978-1-498-77550-2.

Marián Hosťovecký

Hodent Celia is a consultant and a leader in the application of user experience and psychology in video game design and in the development of UX strategy and process in game studios. She is also the founder and curator of the Gam UX Summit, which was launched in Durham, NY, in May 2016, hosted by Epic Games. She has worked on many projects across multiple platforms (Pc, console, mobile, and VR) including Tom Clancy's Rainbow Six franchise, Star Wars, Paragon, Fortnite and Spyjinx. Her main goal of interest is to share knowledge and experiences about how psychology can help offer a better experience for players, in the most concrete and applicable way possible. Offering a better UX also means making a video game (or other products or services) more likely to be successful and reach business goals.[2] Nowadays, she is a freelancer.

The title of the book suggests an invaluable overview of the human's brain and UX neuroscience. The book is divided into two parts: part I. *Understand the brain* focuses on the current understanding of the brain and on cognitive findings, while part II. *A UX Framework for Video Games* focuses on the user experience mindset and practice and how to implement this in game development. At the beginning, before the first part, is an introduction written by Brenda Romero (Game Designer, Ireland).

In the first part entitled *Understand the Brain*, the author explains and describes general information about the human brain. The first part consists of nine chapters. *Chapter one* is the description of what the book is about and who it is intended for. Moreover, some interesting data are presented here, such as what)revenues were in 2015. *Chapter two* really exactly explains the five different myths about how much of our brain we actually use if video games rewire our brain. The author refuses this information and brings exact scientific explanations. She describes cognitive biases and explains how the brain works. *Chapter three* is dedicated to perception. In this part, the Gestalt laws of perception, figure/ground principle, multistability, closure principle, symmetry, similarity and proximity can be found. The specific last example of perception is explaining the Weber-Fechner law with a graphic illustration. *Chapter four* provides findings about memory and how memory works, i.e. how the human brain remembers something (passwords, emails, etc.). The detailed explanations of short-term, long-term, work and sensory memory are given and the author uses interesting characteristic statements. In the penultimate part of the chapter, a reader learns about the limitations of human memory, e.g. how many percent of the content we forget in twenty minutes, after one day etc. In the last part, the attention is focused on the spacing ef-

1 The review was supported by the grant KEGA 011UCM-4/2018: *The impact of serious games on the cognitive process*.

2 Remark by the author: More information about Celia's experiences can be found on her blog: HODENT, C.: *Upcoming Game UX Masterclasses: San Diego & Paris.* Released on 13th August 2018. [online]. [2018-11-21]. Available at: <https://celiahodent.com>.

fect when teaching two features (we read in this regard how Nintendo games or super Mario Bros. are often efficient at introducing new mechanics while consolidating a previously taught mechanic, until both can be combined and another mechanic or a feature is being introduced). Chapter five analyses the term 'attention', meaning how our senses are continuously invaded by multiple inputs from the environment. The terms 'active' and 'passive' attention are explained here, and also into which categories the attention can be divided.

Chapter six brings facts about motivation and the author points out that without motivation there can be no behaviour, no action, and that actually everyone needs to be motivated. Furthermore, she analyses environmental-shaped motivation, reveals that many things we do not want to do are actually done by us anyway etc..., and explains different types of intermittent rewards with graphs. Then, personality and individual needs follow and a description of traits using the Big Five Personality traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) is given. The next *Chapter seven* is focused on emotion. Here we can find the results of a research comparison between American and Japanese participants in a study aimed at watching stress-inducing films, an explanation why emotion can exist without cognition, and the relationship between emotion and cognition. *Chapter eight* analyses learning principles. Some books on behavioural psychology principles by Pavlov, Skinners and Thorndike are quoted here. Finally, the last *Chapter nine* offers a summary of the first part of the book. It contains information about neurons, why neural networks are separated into independent modules etc. Actually, each chapter from the first part of the book is mentioned here.

The second part named *A UX Framework for Video Games* contains chapters such as Game User research, Game analytics and UX strategy, and many more. This part is divided into eight chapters including concluding remarks. *Chapter ten* provides a more or less general overview of game user experience. This chapter is focused on the description of the history of user experience – what UX means, why the human is at the centre of the design process etc. In the middle of the chapter, the statement made by Kim Libreri (Chief Technology Officer of Epic Games) is given. He states that UX gives to companies an unbiased, scientific view on how consumers are reacting to its product – the game. He recommends every company to carry out UX analyses, UX testing and UX feedback. As Libreri says: "Nobody wants to deliberately produce a title that misses the mark" (p. 102). In the last part of the chapter, some definitions of UX – user experiences can be found. The following *Chapter eleven* entitled 'Usability' brings an overview of reasons why it so important to spend time on making a game or software usable. According to the author," usability is about considering the ability of the system image to clearly convey information about what the system means and how it can be used" (p. 109). The author mentions the ten usability heuristics: visibility of system status; match between the system and the real world; user control and freedom; consistency and standards; error prevention; recognition rather than recall; flexibility and efficiency of use; aesthetic and minimalist design; help users recognize, diagnose, and recover from errors; help and documentation. The following subchapter describes the seven usability pillars for game UX. The pillars are as follows: Signs and feedback– it informs the player of the system state, such as the avatar's level of health as represented by a green bar or red hearts on the HUD. The next pillar is clarity. Actually, clarity pertains to the player's ability to understand all the signs and feedback in a game in terms of their perceptibility. The author explains here why clarity is important, why to use a boring classic font rather than artsy font that is difficult to read, how to improve the clarity of the game interface – elements that are close to one another will be interpreted as belonging to the same group; the following pillar states that form follows function. Furthermore, consistency means that "overall conventions in a video game must be consistent" (p. 125). In terms of consistency in controls, it is very important especially because learning the movements one's hand or finger needs to do in order to control the game heavily impacts on implicit memory (p. 126). The three remaining pillars are minimum workload, error prevention and error recovery and flexibility.

Chapter twelve analyses the phenomenon of engage-ability. This chapter provides an overview of three engage-ability pillars for Game UX and the game flow model from Sweetser and Wyeth is analysed here. They recognize "that player enjoyment, the most important goal for video games, had similarities with the concept of flow, which outlines what makes experiences enjoyable and people happy" (p. 136). The following subchapter deals with human motivation that is the motor to satisfy our drives, needs and desires. A part of the chapter is devoted to motivation and serious games, where the author presents readers with the fact that serious games are usually not played for the pleasure of the activity itself but to gain benefits. Each benefit could be different in every serious game. Based on the perspective of self-determination theory, "a game should aim to satisfy the basic psychological needs of competence, autonomy, and relatedness to be engaging" (p. 138). The above mentioned three most important ways to satisfy players' need for motivation are described in more detail. The author points out that "if you have strong power motives, you might design a game that is highly competitive, therefore targeting players with strong power drives while alienating others" (p. 152). The pictures in the chapter try to make readers better understand the author's statements. *Chapter thirteen* analyses design thinking. The chapter is focused on strategies applied to build the design. In the next section of the chapter, John Ballantyne (Oculus Story Studios) gives an interesting example of a UX design challenge in virtual reality. *Chapter fourteen* entitled *Game User Research* is dedicated to scientific methods and user research methodologies and tools. As the author states, the main role of user research is to evaluate a game in terms of its ease of use and its propensity to engage players (p. 185). The author describes some of the experiments in the field of game research focused on players. The last part of the chapter discusses personas – fictional players who will represent the core audience for the game. Actually, this method is an excellent start for having a solid UX strategy.

Chapter fifteen, focused on game analytics, is about game data. Game studios use telemetry (i.e. gathering data remotely) which is a tool to collect anything possible about players' behaviour and what they are really doing once the game is live. The author explains the important role of user experience managers in building bridges among analytics. One subchapter is devoted to the wonders and dangers of telemetry and that 'big data' has become a buzzword nowadays. What is most important is to analyse data and seek improvement. It is worth pointing out that just having terabytes of data does not automatically mean a solution to improve something in a game. *Chapter sixteen* defines UX strategy, and explains the brain's general concepts and skills an individual needs to acquire to get into game development and land a job. The chapter further deals with UX in the production pipeline, and with conception and preproduction. There is an illustration of the Keikendo maturity model integrated in the text that offers a very usable visualization of the different maturity stages, which is helpful when discussing UX strategy with upper management– it clearly explains the benefits and barriers at each level and how to overcome the latter (p. 214). The last chapter of the book represents *Concluding remarks.* As the author herself points out, "the focus of this book is to identify the most impactful ingredients contributing to the success of a video game" (p. 219). One part of the chapter brings more information about serious games and gamification, e.g. how to transfer and make game-based learning truly educational, e.g. by putting cute animations. The author suggests that serious games should always be considered for the playful learning experience they provide.

This book is designed for students, game developers, academics, journalists, and other professionals, it describes processes and provides experiences with UX and neuroscience. Insights from this book could be helpful when preparing a unique gaming recipe for everyone and useful recommendations about UX strategy, game analytics etc. can be found here.

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Michal Kabát

There have been a lot of books about games history written so far. Some better than others, but none with such an interesting and moving story behind its creation as *CRPG Book: A Guide to Computer Role-Playing Games*. It all started in 2014 when Felipe Peppe (@felipepepe), a Brazilian emigrant, currently living in Japan, published a list of the70 best RPG games on the RPG Codex forum. It was received so well within the community that he decided to further enrich this list of games with short descriptions which he managed to put together with help of the forum members. And so he did. It took him far more time than he expected but the result is amazing and available for free to download for anyone under the Creative Commons Attribution – NonCommercial License.

According to the official website, the goal of the project is to gather all the knowledge currently spread across countless websites, books, forums and minds in a single, accessible and visually pleasing tome – for free. It shares the Internet Archive's belief that *"access drives preservation"* and aims to demystify gaming history, offering a reliable and attractive resource for people seeking information – or just a fun game to play.[1]

Across its 528 pages one can find information about over 400 RPGs, from the early PLATO games to modern AAA releases grouped into 8 chronological chapters with short introductions (similar to how Matt Barton's 2008 book *Dungeon and Desktops*[2] is divided) and one chapter containing early Japanese JRPG's and a selection of Fan-Translations, hidden gems and curiosities. The reviews written by a team of 112 volunteers from all around the globe are accompanied by Articles & Guides section with basic info on how to use the book, FAQ and some well-written texts giving the reader broader context on RGP genre specifics and some technological background information. The book was originally published in February as a well-formatted PDF file that can directly be downloaded by anybody without any payment, subscription or registration. It might seem strange at first but Peppe provided a sound explanation on why he decided to make it free for Forbes magazine: "I find it amusing how people are used to getting excellent roguelikes and massive game mods for free, but think a book like this should be sold. Truth is, I believe something like this can ONLY be made as a free project. Just imagine how many copies I would have to sell to pay over 100 writers, including famous developers like Chris Avellone and Tim Cain. Even if I wrote it all by myself (a massive decline in quality) and sold 1 000 physical copies (a decent number for this kind of book) at a 10 USD profit, I would only be paid about 200 dollars per month of work. Now, meeting hundreds of people from all over the world, spreading my hobby, getting over 100 000 downloads in the first week and even helping charity – that's a much more valuable and interesting reward."[3]

Indeed, it sounds reasonable to produce a collaborative work this way but there is more to it. The book was first released as a 1.0 version. Texts were edited, but not properly proofread and contained many small imprecisions and errors due to various sources and the volume of information gathered. Thanks to the enormous number of people who downloaded the file, it was collaboratively checked and corrected to a 1.0.4 version. During the process, Peppe was bombarded with requests to make a printed version (with some people already printing their own copy). To address this demand, he considered various crowdfunding platforms, but then signed a contract for a limited number of hardcover copies with Bitmap Books, a renowned publisher of retro gaming books. Part of the deal was the temporary removal of the PDF from the website (although direct links shared by many websites were kept functional) until the book goes through professional proofreading and gets printed. After that, the final version will be available for free download again. As he puts it, this is a fair deal.[4] The book (with cover art from Jan Pospíšil) will be available for pre-order in January 2019. According to Peppe, all profits from its sale will be donated to Vocação, an award-winning NGO in Brazil that helps kids and teenagers from poor communities to advance their education and find a job.[5]

If you are interested in books about videogames and you like how the community is coming together to help authors, you should also take a look at another project by Richard Moss who is preparing a comprehensive book to be released via Unbounders – a crowd funding publishing platform. It will bring together information on the era of shareware games in early days of the Internet. The full title of the book will be *Shareware Heroes: Independent Games at the Dawn of Internet* and it will explore resources. To get more information, go to and pledge at *unbound.com.* While you are there be sure to also check the hilarious *Things I Learned from Mario's Butt* by Laura Kate Dale.

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Gotland Game Conference and HEVGA European Symposium[1]

The Department of Game Design at Uppsala University, Campus Gotland, has been teaching Game design and development since 2001. The Gotland Game Conference (GGC) is annual conference, which presents and evaluates their work and the general public, international industry, academia and press are invited too. The conference aims to push the boundaries of the field, cares about the culture and human expression – so even the most far-reaching presenters remain accessible to a wide audience of non-experts. The students open the event with presentations of their projects, exposing themselves and the education to insightful critique from an experienced panel of developers, designers, thinkers and artists. It is then proceed with a two day conference. Wide-ranging talks from brilliant people are interspersed with networking on the show floor, among the student's games.

The GGC, held on June 5-6, 2018, invited speakers from Chicago, Pittsburgh, Berlin, Malmö and Warsaw and discussed empathy and emotion in video games. It focused on concepts like emotional intelligence, empathy, social interaction, identity and all sorts of personal- and human interaction. Heidi McDonald has looked at the narrative burden for creating empathy, Doris C. Rusch has talked about the existential game design and Bartosz Sobolewski has looked at the empathy of games through art. Albertina Sparrhult has talked about the practical leadership for a healthy and productive studio culture. Finally Malena Klaus has looked at the kick started intimacy of how to design intimate spaces for strangers.

Since 2017, the Department of Game Design also hosts the Game Educators Summit. In 2018, it was The HEVGA European Symposium that took place on June 7-8, 2018, as a part of the GGC. The Higher Education Video Game Alliance (HEVGA) supports higher education in digital games through information-sharing, resource development, and community engagement. In present, it has associates from 180 universities and other higher education institutions in the field of digital games from 18 countries around the world. Regarding Slovakia, the Faculty of Mass Media Communication at the University of Ss. Cyril and Methodius in Trnava is the only member of HEVGA, but it plans to expand in other Central and Eastern European countries in the near future, as mentioned at the Central and Eastern European Game Studies Conference 2018 in Prague.

The Gotland summit itself brought together educators from across Europe to discuss the structure of game educations. The first day featured presentations across a wide variety of areas such as research, game educations, pedagogy, game design, games, institutional barriers and successes, within and across borders barriers and successes, and programs or initiatives unique to Europe. The second day consisted of a working meeting designed to bring together diverse institutions and individual backgrounds to take stock of where games and game educations in Europe are at now. The working meeting explored how to create a platform that could further establish a European games community in higher education across borders. Specific topics included: how to secure funding, creating a network that connects educations, amplifying local achievements globally, and avenues for unified advocacy.

1 Information is published with permission of the official conference organisers from Uppsala University.

Slovakia is Finally Jammin'

Game jams are popular and well established forms of creating games in a fun and accessible way. During a game jam, similarly to a music jam, people from all kinds of environments from within and outside the industry gather to develop games in a short time period. There are thousands of different jam types (vary in size, rules, etc.) and dozens of them are happening around the globe at any given time.

In Slovakia, game jams have a rather short history. Although, some people participated in international events, Slovakia didn't organize any on its own. There were a few company based jams and creative happenings tied to other events, especially on the demo scene, but generally, there is a great gap behind the 'western world', including the Czech Republic or Poland. For example, the biggest worldwide happening Global Game Jam (GGJ) started in 2009 with 53 participant countries. The Czech Republic joined in 2011, Slovakia in 2018 together with 11 African countries. The first GGJ took place at the University of Ss. Cyril and Method in Trnava in January 2018, and the next one is planned for January 25-27, 2019.

However, Slovak jamming has not started there. The first event solely dedicated to creating games during a short period of time was the Bratislava Game Jam (BGJ) in 2015. This year, it took place for the fourth time with 23 teams and an international jury. The main theme was 'Weather control' and all 17 finished games are available at www.bgj.sk. After the success of BGJ and an increase in overall awareness about game jams they quickly became a part of game related festivals. In 2016 there was the first jam connected to Game days of Fest Anča Festival in Žilina, and from 2018 there is the jam associated with the Comic Salon in Bratislava. In 2019, Game Days will become a separate event that will take place in Trnava, accompanied with a game jam and hardware hackathon.

It seems that Trnava, partly due to having the first game related academic study program, is becoming a hub for most of the game related events. Regarding game jams, it is worth mentioning that, in May, Trnava hosted the so far biggest international jam, as a part of the LAG Festival, connecting almost 100 students from Poland, the Czech Republic and Slovakia. Eight teams worked on their games based on a randomly generated theme for 5 days and the results were presented during the game festival in Cieszyn.

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The Game is Out There

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Dr. Wojciechowski deals with issues of necromarketing, semiotics, guerrilla marketing, the history of cinema and photography. He has practical experience in film production as a photographer. He graduated from the Institute of Literary and Artistic Communication of Constantine the Philosopher University in Nitra and the Institute of Creative Photography of the Silesian University in Opava. He is currently a lecturer at the University of Ss. Cyril and Methodius in Trnava. He has won several awards such as photographic Grand-Prix (theater photography). He has had over 20 exhibitions and he has published photography in media and movie posters.

Glitch represents an unexpected event, an occurrence during which the system swings away from planned operation or behavior. The term doesn't reflect only the syntactic, logical or semantic error in the code but also an error caused by an external factor.[1] An audiovisual glitch brings in a phenomenon reflected theoretically, critically and artistically as an object of aesthetical interest mainly for its character of randomness in occurrence and appearance. Pure glitch uncovers something important to an unsuspecting user – it reveals otherwise invisible parts of the system hidden within the functional user interface. Glitch provides a counterbalance by introducing irrational or spontaneous elements into otherwise perfectly operating systems. Indeed, glitch really offers the user an introduction to the gnoseology and ontology of a machine by uncovering what should have been hidden. In line with the terminology of theoreticians Grusin and Bolter – immediate elements are suddenly subjected to hypermediacy.[2] Uncalled-for transmedia[3] *residuum of War of the Worlds* from H. G. Wells in the interpretation of Tomohiro Nishikado from 1978 is now attacking.

Picture 1: "The Game is Out There"
Source: own processing, ©Photo: Łukasz P. Wojciechowski, 2017.

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