



Acta Ludologica

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Acta Ludologica is a scientific journal in the field of games and 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 and scientific reviews of digital games.

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Cinematography May Have Finally Found a Recipe for Games

Adapting games to other narrative media, especially movies, has always been a challenge and in addition has been one of the arguments within the ludology and narratology dispute during the establishment of game studies. History is full of such attempts, but only a few achieved greater successes without a significant negative response from the given games' fans, particularly due to the different requirements of these media (such as interactivity level). However, games have recently more intensively and naturally crossed over into other areas, and it seems a paradigm in the approach to making films from games has also shifted, which can positively skew the scales within this issue. Since just the beginning of the year, we have already witnessed the release of several movies and TV shows based on games, which were unusually very well received by viewers, players, and critics, even though they were based on completely various game types, motifs, genres, and narrative forms.

The first was the anxiously anticipated TV series *The Last of Us*, an adaptation of the digital game of the same name that belongs to one of the most acclaimed by critics and gamers. The production of this gripping storytelling survival drama set in a post-apocalyptic 'zombie-like' world was under the scrutiny of gamers and fans who were worried whether the adaptation even had a chance to reach the quality of its original. The show was followed by a less conspicuous historical-biographical artwork about the path of the Soviet game legend, *Tetris*, today one of the most famous and best-selling games of all time, into the hearts of gamers all over the world. In addition, the movie finally answered a question that arose years ago with the first rumours about preparing an adaptation of this game: How can a game without any narrative be adapted into a film? The movie *Dungeons & Dragons: Honor Among Thieves* brought the iconic tabletop role-playing game to the screen, enchanting viewers with epic fantasy quests, magical creatures, and intricate character development (featuring a diverse ensemble cast), appealing to both long-time enthusiasts and newcomers to this non-digital game. And soon after, the full-length animated film *The Super Mario Bros. Movie* arrived in cinemas and treated viewers with its colourful vibrant animation, humour, and nostalgic tribute to the timeless game series during this amusing adventurous journey with Mario and other iconic gaming characters.

Considering such a diverse and small sample, it is difficult to find common attributes behind their successes, however, at least for the narrative games among these four, greater involvement in the adaptation process of the companies (in one case even specific people), who created them or own their licenses, is evident. This tendency is also supported by the current trend of establishing studios to oversee film and TV adaptations at major game companies (e.g., PlayStation Productions) or the 'format unification', noticeable in streaming services, which have already offered game content (e.g., Netflix, Amazon Prime). In any case, it will be interesting, as well as possibly cinematically enriching the gaming experience, to continue monitoring this phenomena's development.

Just as the subjects of mentioned film adaptations were diverse, so the presented issue of the journal *Acta Ludologica* offers a wide range of topics in the field of games and digital games. Dimitrios Charitos and Eleni Timplaxi focus on immersive theatre in terms of pervasive games and gamification. Radoslav Baltezarević, Vesna Baltezarević, and Ivana Baltezarević examine the role of digital marketing in the eSports industry, specifically in promoting brands on digital platforms. A systematic review of the literature on improving team cohesion via digital games is carried out by Juraj Kovalčík, Magdaléna Švecová, and Michal Kabát. Dave Havey deals with the importance of understanding the professional knowledge of digital game artists for game development. Key features of the game development and publishing processes, which influence the quality of digital game localization, are presented by Marián Kabát. Finally, Zuzana Kvetanová applies R. Caillois' typology to the strategy games genre.

In the interview, science historian Victor Monnin discusses interconnections between digital games and palaeontology with palaeontologists Caitlin Syme and Jake Atterby. The reviews section offers scientific assessments of a Japanese cyberpunk supernatural role-play game, *Soul Hackers 2*, a highly anticipated action role-play game from the Harry Potter universe, *Hogwarts Legacy*, and the already mentioned HBO series *The Last of Us*. Vajk Pomichal concludes the issue by determining the essential questions for future research on the utilization of board and digital games within education.

On behalf of *Acta Ludologica's* editorial office, I wish the readers an enriching experience while reading the contributions in this issue.

Mgr. Zdenko Mago, PhD.

Acta Ludologica's Editor-in-Chief

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Tracing the Impact of the Digital Virtual Ludic on Immersive Theatre: A Case of Theatre Gamification

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ABSTRACT:

Immersive theatre, a theatrical form emerging at the beginning of the 21st century, invites spectators to become immersed in interactive theatre performances. The use of the term immersive indicates a strong influence from digital media, particularly from virtual worlds (VWs). Immersive theatre and VWs appear to share characteristics. A systematic comparative approach tracing the presence of characteristics shared by immersive theatre and VWs (i.e., virtuality, worldliness, information intensity), among others, still unique to VWs (i.e., agency, ergodicity), reveals that immersive theatre has assimilated some VWs characteristics while still being in the process of negotiating others. The paradigm of pervasive games is brought into the conversation to claim immersive theatre as a partially successful case of theatre gamification, revising theatrical and dramatic conventions, towards what could be called a digitally and ludically inspired neo-dramatic. New inter-medial forms of expression could benefit from the adoption of a game/play frame.

KEY WORDS:

digital games, immersive theatre, pervasive games, theatre gamification, virtual worlds.

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Introduction

Immersive theatre is a trend of performances “which use installations and expansive environments, which have mobile audiences, and which invite audience participation”.¹ It tends to resist any straightforward definition as a genre with fixed codes and conventions, since it refers to “pluralities of practice”.² These pluralities are manifest so that immersive theatre is often referred to as immersive ‘shows’, ‘performances’, ‘performance installations’, ‘events’ and ‘experiences’, with no special concern for accuracy in the use of terminology. Instead, what seems to matter is spontaneity and the impulse of the spectators’ urge to share their impressions, together with any effects the immersive practices have had on them. This imprinting of powerful, mesmerizing experiences upon spectators’ memories by immersive theatre performances is said to occur, using a metaphor of transportation,³ as an outcome of immersion, a sense of diving into a universe, mingling with it and its inhabitants. Typical immersive theatre creators include Punchdrunk, Third Rail Projects, Speakeasy Dollhouse and many more.⁴

1 WHITE, G.: On Immersive Theatre. In *Theatre Research International*, 2012, Vol. 37, No. 3, p. 222.

2 MACHON, J.: *Immersive Theatres: Intimacy and Immediacy in Contemporary Performance*. London : Palgrave Macmillan, 2013, p. 15-16.

3 RYAN, M-L.: *Narrative as Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media*. Baltimore, MD : John Hopkins University Press, 2015, p. 66.

4 For more information, see: *Punchdrunk*. [online]. [2023-03-16]. Available at: <<https://www.punchdrunk.com/>>; *Third Rail Projects*. [online]. [2023-03-16]. Available at: <<https://thirdrailprojects.com/>>; *Speakeasy Dollhouse*. [online]. [2023-03-16]. Available at: <<http://speakeasydollhouse.com/>>.

It is difficult to demarcate a prototype for immersive theatre, especially as current scholarship and media use terminology at will, rather than by contemplating criteria about what constitutes an immersive theatre performance. This terminological fluidity becomes evident with immersive theatre productions and creators resisting classification under the category of 'immersive theatre'. Dreamthinkspeak, for example, has been established in the 'collective psyche' as immersive theatre creators, a viewpoint not always supported by them in interviews.⁵ Rift consider their work "experiential" rather than "immersive", although media may refer to it by the latter term.⁶ Furthermore, an artist may create an immersive theatre performance, but not be self-defined as an immersive theatre maker until the very performance takes place. Such is the case of A. Hoepfner, who is self-defined as "a touring musician before falling in love with the form of immersive theater".⁷

The sample of immersive theatre performances that sparked this analysis mostly comprises ones that are primarily acknowledged by their makers as such and form a medi-ally distinct qualified genre, such as Punchdrunk's. This immersive theatre paradigm usually builds unique dense and inviting worlds, sometimes in a site-specific logic, to be experienced as navigable environments, in physically open or closed spaces, where performers and spectators interact *within* a fictional frame. These worlds are often illustrated through the massive use of intense scenography and costumes. The scenic environment becomes a lived space and the spectators in it, ideally, accomplices. A central linear dramatic plot is abandoned for what appears to be a constellation of procedural, fragmental, ergodic⁸ narrative strands.

The explosive expansion of the ludosphere means that practices and concepts relating to play and games become ubiquitous in all kinds of cultural spheres.⁹ The use of the term *immersive* itself indicates an obvious influence from digital media, also verified in a theatre studies perspective.¹⁰ The aforementioned traits of immersive theatre are clearly met in the intersections between the fields of *human-computer interaction* (HCI) and game studies, *virtual worlds* (VWs), especially those of digital role-playing games, but also *virtual environments* (VEs)¹¹ and *virtual reality* (VR).¹² The term VW signifies "a synchronous, long lasting network of people, represented as avatars, facilitated by networked computers".¹³ VWs include an array of types from game-oriented to socially oriented worlds, such as *massively multiplayer online* (MMOs), *massively multiplayer online games* (MMOGs), and *massively multiplayer online role-playing games* (MMORPGs) "and then they include everything

5 HANRA, H.: *We Took a Ride on the You Me Bum Bum Train*. Released on 19th June 2015. [online]. [2023-03-30]. Available at: <<https://www.vice.com/en/article/dp5pdv/you-me-bum-bum-train-378>>.

6 Rift. *Stories Without Boundaries*. [online]. [2023-03-16]. Available at: <<http://www.r-ft.co.uk/>>.

7 *Houseworld Immersive*. [online]. [2023-03-16]. Available at: <<http://houseworld.nyc>>.

8 For an introduction to the notion of the *ergodic*, see: AARSETH, E.: *Cybertext: Perspectives On Ergodic Literature*. Baltimore, MD: Johns Hopkins University Press, 1997.

9 STENROS, J., KULTIMA, A.: On the Expanding Ludosphere. In *Simulation & Gaming*, 2018, Vol. 49, No. 3, p. 345.

10 CARLSON, M.: Postdramatic Theatre and Postdramatic Performance. In *Revista Brasileira de Estudos da Presença*, 2015, Vol. 5, No. 3, p. 586.

11 Remark by the authors: VEs are computer-generated and sustained synthetic environments, to be experienced at the level of both representation and presence.; See: NAZIR, S. et al.: *Virtual Reality and Augmented-Virtual Reality as Tools to Train Industrial Operators*. In BOGLE, I. D. L., FAIRWEATHER, M. (eds.): *22nd European Symposium on Computer Aided Process Engineering*. Oxford: Elsevier, 2012, p. 1397-1401.

12 Remark by the authors: "A high-end user-computer interface that involves real-time simulation and interactions through multiple sensorial channels"; BURDEA, G., COIFFET, P.: *Virtual Reality Technology*. New York, NY: Wiley, 2003, p. 3.

13 BELL, M. W.: Toward a Definition of "Virtual Worlds". In *Journal of Virtual Worlds Research*, 2008, Vol. 1, No. 1, p. 2.

in-between”.¹⁴ A VW is necessarily accessible through an avatar and aspires to incorporate the subject in the game world, whereas a VE may just imply a first-person perspective without perceivable embodiment. A VR may not have role playing capacities.¹⁵

Could immersive theatre be an instance where the theatrical metaphor, the *modus operandi* of *theatrum mundi* (“all the world’s a stage”) merges with that of *ludus mundi* (life as a [computer] game),¹⁶ thus justifying the use of terms such as ‘events’ and ‘experiences’ to also describe immersive theatre performances? Is immersive theatre truly a theatrical or a hybrid intermedial form occurring at the intersections between performance, play/games and VWs, somewhat hastily being labelled ‘theatre’?

Approaching immersive theatre from a game studies/digital media perspective may have a lot of potential. First of all, some theoretical approaches framing such an impact and indicative manifestations are presented, followed by an attempt to discuss the digital virtual ludic in the example of VWs and immersive theatre, in relation to key notions, such as virtuality. A systematic examination of major key characteristics shared by both medial forms leads to the conclusion that at least some of them are found to be *imported* from the digital virtual ludic to immersive theatre. The process of negotiating, assimilating and adapting such distinct characteristics in immersive theatre is revealed to convey a more specific prototype, that of pervasive games, a digital virtual ludic medial form which draws upon a mixed notion of physicality/virtuality.

The aims of the article are to i) trace the impact of the digital virtual on immersive theatre by focusing on its assimilated characteristics as well as those posing diachronic challenges for immersive theatre ii) locate the digital virtual gaming form that possibly serves as a prototype for immersive theatre iii) explore the conceptual implications and paradoxes emerging from the use of the term ‘theatre’ to describe immersive performances and iv) propose that immersive theatre is a case of theatre gamification that revises theatrical and dramatic conventions towards what could be called a digitally and ludically inspired *neo-dramatic*.

In order for this problematic to be explored, a conceptual rather than a morphological approach appeals, because taking a specific example as a paradigm for the whole could lead to generalizations about the rest of the immersive practices. Some examples of immersive theatre performances are, of course, mentioned to better situate the reader within the problematic, but the focus of the article remains on the conceptual interrelations between immersive theatre and digital virtual gaming. The discussion involves mostly VWs as an example of the digital virtual ludic that appears to facilitate a comparative analysis with immersive theatre more than, for example, a digital game with no clear role-playing element, like *Pacman*¹⁷, or a disembodied training simulation with basic ludic references.

14 Remark by the authors: The term will, from now on, be used as a generic one to convey digital virtual play/gaming, unless otherwise stated. Both VR and VEs partially overlap with VWs, as VWs may become VR through the use of technical gear.; COX, A. M. et al.: Virtual Worlds, Virtual Reality, and Augmented Reality: Differences in Purchase Intentions Based on Types, Users, and Sex. In *Journal of Virtual Worlds Research*, 2017, Vol. 10, No. 1, p. 2.

15 Remark by the authors: However, VR is elsewhere considered to include “Desktop VR” systems that display the virtual environment on a 2-D desktop computer screen and “second-person VR” systems that represent the user as an avatar (or figure) on the screen, without a first-person perspective, thus seen as a broader category than VWs.; For more information, see: SCHROEDER, R.: Networked Worlds: Social Aspects of Multi-User Virtual Reality Technology. In *Sociological Research Online*, 1997, Vol. 2, No. 4, p. 89-99.; Remark by the authors: Furthermore, while VEs may be technical simulations for operational or training reasons, the term VR may strongly refer to the use of equipment, such as headgear.; COX, A. M. et al.: Virtual Worlds, Virtual Reality, and Augmented Reality: Differences in Purchase Intentions Based on Types, Users, and Sex. In *Journal of Virtual Worlds Research*, 2017, Vol. 10, No. 1, p. 2.

16 STAMPFL, N. S.: *Gamification: Life As A (Computer) Game?*. Released on November 2013. [online]. [2023-03-30]. Available at: <<https://www.goethe.de/ins/bd/en/kul/tec/amd/20371175.html>>.

17 NAMCO: *Pac-Man*. [digital game]. Tokyo, Chicago, IL : Namco, Midway, 1980.

Indicative Manifestations of the Impact of the Digital Virtual Ludic onto Immersive Theatre

The time period marking the rise of immersive theatre, according to M. Carlson, is the beginning of 21st century,¹⁸ synchronous to the wider social and cultural impact of the digital revolution. The ways in which immersive theatre companies try to reproduce VWs' liveness and presence and bring them into physical space have not remained unnoticed..¹⁹ R. Biggin provides examples where the overlap between games and immersive productions received some attention in the past.²⁰ Her reframing of the narrative vs. ludology debate²¹ within an immersive theatre context, as well as her systematic presentation of the *Sleep No More* (2003) project by Punchdrunk and MIT Media Lab,²² one of the more admired immersive theatre performances, adheres to the certainty of M. Carlson's suggestion. Interestingly enough, E. Pérez and L. S. Coterón suggest correspondences between HCI and Human-to-Human-Interaction (H2HI) within a game design context.²³ E. Pérez's doctoral analysis,²⁴ in fact, focuses on the impact of digital media on contemporary mixed-media performance. Empirical data in the field of interest further whet the appetite:

Since the boom of large-scale immersive performances such as those of Punchdrunk, or so-called by media such as those of You Me Bum Bum Train, Shunt, and Dreamthinkspeak, various reviewers have compared their experience of such work with their experience of playing digital games and navigating VR. T. Bosanquet states: "There's a computer game-like experience offered by immersive theatre that really appeals to a younger generation".²⁵

Immersive theatre sometimes directly converses with the use of digital technology to generate and enhance its experiences. When it does, digital technology is usually embedded within the concept, function and/or narrative of the performance. Such a case appears to be *Somnai* (2018) by Dotdotdot, which aspires to create a layered reality using VR, augmented reality (AR) and projection mapping, while exploring lucid dreaming and the subconscious. Other cases, rather 'unclassifiable' immersive performances that are not

18 CARLSON, M.: Postdramatic Theatre and Postdramatic Performance. In *Revista Brasileira de Estudos da Presença*, 2015, Vol. 5, No. 3, p. 586.

19 OWEN, D.: *Player and Avatar: The Affective Potential of Videogames*. Jefferson, NC : McFarland, 2017, p. 46.

20 BIGGIN, R.: *Immersive Theatre and Audience Experience: Space, Game and Story in the Work of Punchdrunk*. London : Palgrave Macmillan, 2017, p. 157.

21 Remark by the authors: This debate was 'hot' in 00's, when radical ludology was seen by 'narrativists' as wanting to dispose of the notion of story in games. See also: FRASCA, G.: Ludologists Love Stories, Too: Notes from a Debate that Never Took Place. In COPIER, M., RAESSENS, J. (eds.): *Proceedings of the 2003 DiGRA International Conference: Level Up*. Utrecht : Utrecht University, 2003, p. 92-99.

22 BIGGIN, R.: *Immersive Theatre and Audience Experience: Space, Game and Story in the Work of Punchdrunk*. London : Palgrave Macmillan, 2017, p. 157-175.

23 For example, see: PÉREZ, E., COTERÓN, L. S.: Performance Meets Games: Considering Interaction Strategies in Game Design. In *Digital Creativity*, 2013, Vol. 24, No. 2, p. 157-164.

24 For more information, see: PÉREZ, E.: *The Impact of Digital Media on Contemporary Performance: How Digital Media Challenge Theatrical Conventions in Multimedia Theatre, Telematic and Pervasive Performance*. [Dissertation Thesis]. Trondheim : Norwegian University of Science and Technology, 2016.

25 KLICH, E.: Playing a Punchdrunk Game: Immersive Theatre and Videogames. In FRIEZE, J. (ed.): *Reframing Immersive Theatre: The Politics and Pragmatics of Participatory Performance*. Basingstoke : Palgrave Macmillan, 2017, p. 221.

necessarily defined by their makers as immersive theatre, such as *Kidnap* (1998) by Blast Theory. *Best Before* (2010) by Rimini Protokoll and *Symphony of a Missing Room* (2012) by Lundahl & Seidl, flirt strongly with the use of digital technology.²⁶

Positioning VWs and Immersive Theatre on the Virtual Continuum

The term *virtual* has come to signify *digital* or computer generated and sustained. Despite the fact that a wide audience is nowadays acquainted with VR experienced through various systems, such as desktop or immersive ones,²⁷ the term virtual is not exhausted in the case of VWs, VEs or VR, but stretches along an axis delimited by two poles; at one end is the optical sense, the virtual as fake, with the negative connotations of illusion, and, at the other, there is the scholastic sense, with the virtual as potential, connected to productivity, openness and diversity.²⁸ This latter approach is supported by P. Lévy who explains that the virtual is a “powerful mode of being that expands the process of creation, opens up the future, injects a core of meaning beneath the platitude of immediate physical presence”.²⁹ Hence, the term virtual, signifying the experience of being in any mediated environment, may apply in quotidian contexts or ‘virtual realities’ of painting, writing or even thinking, and can be met in literature, arts, philosophy and dreaming.³⁰ Computer related virtual realities are not then the sole virtual ones.³¹ The notion of the virtual can thus be conceived as a continuum, upon which various media, including artistic forms, may be anchored.

VWs/VEs/VR are based upon the same abstract notion shared by any synthetic environment created for the framing of a certain activity, situation or experience, during which information is conveyed to the human subject who actively experiences this environment.³² Furthermore, the virtual and the fictional partly overlap and share the need of immersion in textual or iconic worlds.³³ L. Doležel builds upon U. Eco’s concept of “furnished” human constructs and describes possible fictional worlds as “ensembles of non-actualized possible

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- 26 See: *London's New Immersive Theatre Production Somnai | First Look | Time Out*. Released on 24th January 2018. [online]. [2023-03-17]. Available at: <<https://www.youtube.com/watch?v=-yzbDKA-D4s>>. ; *Blast Theory*. [online]. [2023-03-16]. Available at: <<https://www.blasttheory.co.uk/>>. ; *Rimini Protokoll*. [online]. [2023-03-16]. Available at: <<https://www.rimini-protokoll.de/website/en/>>. ; *Lundahl & Seidl*. [online]. [2023-03-16]. Available at: <<http://www.lundahl-seidl.com/>>. ; Remark by the authors: This immersive experience was also held at the Acropolis Museum within the framework of the 2012 *MIRfestival*.; See also: *MIRfestival 2012*. 2012. [online]. [2023-03-16]. Available at: <<http://www.mirfestival.gr/12/en/programme.html#>>>.
 - 27 For more information, see: SCHROEDER, R.: Networked Worlds: Social Aspects of Multi-User Virtual Reality Technology. In *Sociological Research Online*, 1997, Vol. 2, No. 4, p. 89-99.
 - 28 RYAN, M-L.: *Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media*. Baltimore, MD : Johns Hopkins University Press, 2001, p. 27.
 - 29 LÉVY, P.: *Becoming Virtual*. New York, NY : Plenum, 1998, p. 16.
 - 30 OTTO, P.: *Multiplying Worlds: Romanticism, Modernity and the Emergence of Virtual Reality*. New York, NY : Oxford University Press, 2011, p. 5-7.
 - 31 Remark by the authors: In fact, as their rich pan-sensorial representations and simulations are organized around partially actualized entities and predicted scenarios during the programming phase, they partially tend to resolve the knot of tendencies that the virtual is, rendering it contextualized, specific and eventful for the user.; LÉVY, P.: *Becoming Virtual*. New York : Plenum, 1998, p. 171.
 - 32 CHARITOS, D.: Dytitiki Pragmatikotita: Ena Proothimeno Systema Diepafis Anthropou-Ypologisti I Ena Neo Meso Epikoinonias?. In *Zitimata Epikoinonias*, 2005, Vol. 2, No. 1, p. 97.
 - 33 RYAN, M-L.: *Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media*. Baltimore, MD : Johns Hopkins University Press, 2001, p. 89-91.

particulars – persons, states, events, and so on”.³⁴ Besides, VWs can be created to simulate the physical world or represent a totally fictional, imaginable or conceptual space.³⁵ From a Theatre Studies perspective, dramatic theatre offers an excellent paradigm of the virtual at work as it is based on the tension between the literal and the metaphorical, the physical and the fictional, giving rise to ever-changing and shape-shifting knots of tendencies. The core function of dramatic theatre is the layering of a concrete fictional possible world, a fragile, vulnerable but also persistently adaptive state upon the stage, by means of mutual complicity between actors and spectators.³⁶

Immersive theatre may seem to be an extreme materialized manifestation of the virtual. Its thematic fictional cores ‘bleed into’ its expanded theatrical magic circle as they get visually, aurally and tactily incarnated, embodied, and deluge the spectators’ perceptual and performative fields. However, a closer look at immersive theatre reveals that the fictional and the physical have merged into one sole hybrid representational entity: the fictional has become partly physical, it has been *authored* as physical, it does not stand for the fictional anymore, but feels more grounded in the ‘real’. The immersive theatre fictional feels somehow more ripped off from its metaphorical dynamic. A bit like A. Artaud messing with super-naturalism, void of expressionistic cosmogonic explosivity and surrealist uncanniness; alarming, but also descriptive, of manageable human proportions.³⁷ In this process of the literal physical and fictional modal collision in one hybrid form, theatre loses part of its virtuality, a loss which further augments with its so-called ‘interactive’ dimension. The latter, through small ‘events’ occurring between spectators, the environment and the performers, renders specific the timeless and non-localized virtual.³⁸ In this respect, immersive theatre cannot claim to be more virtual than non-immersive theatre, despite its hermeticity and the promise of detachment from the quotidian,³⁹ conditions undoubtedly facilitating the virtual, as in VR, for example, but not virtual in themselves.

Tracing the Impact of the Digital Virtual Ludic on Immersive Theatre

The following analysis evolves around two axes. On one hand, it explores the major assimilated key characteristics of the ludic digital virtual, as manifesting exemplarily in VWs, met in immersive theatre. On the other, it also traces the digital virtual ludic characteristics *being* assimilated by immersive theatre. The restricted absorbance of those elements should not be considered as an, objectively speaking, ‘failure’ of immersive theatre; on the contrary, they should be seen as reflective elements, rising from an awareness of performative utterances,⁴⁰ posing challenges to which immersive theatre tends to respond by the creative adoption of strategies.

34 DOLEŽEL, L.: Possible Worlds of Fiction and History. In *New Literary History*, 1998, Vol. 29, No. 4, p. 787.

35 LEPOURAS, G. et al.: *Anaptyxi Systimaton Eikonikis Pragmatikotitas*. Athens : Kallipos, 2015, p. 3.

36 ELAM, K.: *The Semiotics of Theatre and Drama*. London, New York, NY : Routledge, 2003, p. 88-103.

37 For more information, see: ARTAUD, A.: *The Theatre and Its Double*. London : Calder and Boyars, 1970.

38 Remark by the authors: Philosophically speaking, the two terms *virtual* and *interactive* can be used together, but only under the restrictions imposed by the virtualization and actualization processes.; LÉVY, P.: *Becoming Virtual*. New York, NY : Plenum, 1998, p. 171.

39 GRAU, O.: Into the Belly of the Image: Historical Aspects of Virtual Reality. In *LEONARDO*, 1999, Vol. 32, No. 5, p. 365.

40 AUSTIN, J. L.: *How to Do Things with Words*. Oxford : University Press, 1962, p. 16.

1. The digital virtual ludic /VWs assimilated characteristics in immersive theatre

The following discussion refers to the major and key characteristics that VWs immersive theatre has more or less assimilated, such as immersion, worldliness and role playing, as well as sheds light on the details of their assimilation process.

a) Worldliness: a space becoming a world

A *topos* where the virtual, the fictional and the physical meet is that of space/world. M.-L. Ryan talks about textual and iconic worlds,⁴¹ U. Eco about 'furnished' ones⁴² and L. Doležel of possible fictional worlds.⁴³ J. Huizinga's magic circle is a space where the development of temporary worlds within the ordinary is feasible.⁴⁴ M. Heim notes that "a world is not a collection of fragments, nor even an amalgam of pieces. It is a felt totality or whole [...] not a collection of things but an active usage that relates things together, that links them. [...] World makes a web-like totality [...] World is a total environment or surround space".⁴⁵

The very term *cyberspace* implies a spatial metaphor. The notion of 'world' is crucial in ludic digital gaming examples such as VWs. This worldliness is an outcome of VWs in general, which are environments, spatial representations, inviting us to inhabit them and experience them as 'real', to have an impact on them and to receive back constant sensorial input. We come to inhabit them as virtual ecologies, as "miniature gardens",⁴⁶ discover their affordances and augment their representational load with a somatic, physical experience, expanding the horizon of our intentionality.⁴⁷ The sense of the 'worldliness' of VWs feels seductive but is also fragile. Any irrelevant stimuli in the form of sensorial input from the physical world, not designed to contribute to VWs, are in tension with them and cause a destabilization of presence and immersion in the VW. A major characteristic of the VWs worldliness that pervades immersive theatre performances is that of 'persistence'.⁴⁸ In VWs, the users feel that the world existed before them, awaited them to inhabit it and will exist and evolve even without them. Immersive theatre performance spaces have exactly the same feeling. The importance of space *becoming* a world to be inhabited is prominent. Everything is ready for the spectator to perceive, explore and occupy.

b) Information Intensity

VWs achieve sustaining their worlds by means of *information intensity*. Information intensity is related not only to the richness and the density of information, but also to its variability in terms of the sensorial modality and *how* information reaches the user (visually, aurally or otherwise).⁴⁹ It is one of the three most important elements of VR in that only through intense information may the digital virtual world be sustained.⁵⁰

41 RYAN, M.-L.: *Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media*. Baltimore, MD : Johns Hopkins University Press, 2001, p. 89-91.

42 For example, see: ECO, U.: Producing signs. In BLONSKY, M. (ed.): *On Signs*. Baltimore, MD : Johns Hopkins University Press, 1985, p. 176-183.

43 DOLEŽEL, L.: Possible Worlds of Fiction and History. In *New Literary History*, 1998, Vol. 29, No. 4, p. 787.

44 HUIZINGA, J.: *Homo Ludens: A Study of the Play-element in Culture*. London : Routledge & Kegan Paul, 1949, p. 10.

45 HEIM, M.: *Virtual Realism*. Oxford : Oxford University Press, 1998, p. 89-91.

46 GINGOLD, C.: *Miniature Gardens & Magic Crayons: Games, Spaces, & Worlds*. [Dissertation Thesis]. Atlanta, GA : Georgia Institute of Technology, 2003, p. 7-8.

47 GIBSON, J. J.: *The Ecological Approach to Visual Perception*. London : Psychology Press, 1986, p. 138-140.

48 See: ZHANG, K., KEMME, B., DENAULT, A.: Persistence in Massively Multiplayer Online Games. In CLAYPOOL, M. (ed.): *NetGames 2008. Network and Systems Support for Games*. Worcester, MA : Worcester Polytechnic Institute, 2008, p. 53-58. [online]. [2023-03-16]. Available at: <<http://www.cs.mcgill.ca/~adenau/pub/persistence.pdf>>.

49 ELLESTRÖM, L.: The Modalities of Media II: An Expanded Model for Understanding Intermedial Relations. In ELLESTRÖM, L. (ed.): *Beyond Media Borders. Volume 1*. Cham : Palgrave Macmillan, 2021, p. 49.

50 HEIM, M.: *Virtual Realism*. Oxford : Oxford University Press, 1998, p. 7.

The highly realized, materialized iconicity of immersive theatre, haptically inviting, and potentially interactive, often goes hand-in-hand with the provision of extreme detail in the scenic environment. This super-naturalistic trend of environments is not as much an aesthetic choice, but can be attributed to the need of addressing the attribute of information intensity in order for immersion to be sustained. The corpus of the information intensity category in immersive theatre performances is shaped as in thematic scenic environments, atmospheres, performers' polytopic actions – rather than actions on a monotopic stage, multisensorial invitations to visual, aural, tactile, even smell and taste stimulation. Immersive theatre rephrases information intensity as rich iconicity and abundance of pan-sensorial stimuli. An immersive theatre performance usually adopts a navigational point of view for the spectator, rephrasing, by physical means, the assimilation of VWs and digital role-playing games, in particular.

c) Immersion: taking the plunge into a diegesis?

When we come face-to-face with a sensorially intense, rich in information and provocative world, our exploratory navigational instinct prompts us to enter and experience it as an environment. A prerequisite for immersion is an alternate state of things into which we take the plunge, separated by the observing subject with a material and/or conceptual membrane. Indeed, a frame separating the two worlds is needed; on one hand, there is the world where the subject is literally situated, and, on the other, another world into which the subject wishes to be metaphorically transported. In immersive theatre, the transportation is both conceptual and/or material, symbolically validating the subject's visit to the immersive universe as literal.

Immersion is a term with which the wide audience came in contact with VR applications before immersive theatre. The term describes the involvement of a user in a VW during which the user's awareness of 'real' time and the world often becomes irrelevant, because another world absorbs the user's focus. L. Freina and M. Ott define this term as a "perception of being physically present in a non-physical world by surrounding the user in the VR system created with images, sound, or other stimuli", so that a participant feels he or she is actually 'there'. The user feels somehow disconnected from reality, also gaining a sense of 'being' in the task environment instead.⁵¹ The degree of immersion indicates the level to which users feel they 'really are' situated within the virtual environment and not in the physical one.⁵²

Immersion is simultaneously the prerequisite and ideal key for breaking through towards a fictional or virtual world. From a more narratological point of view,⁵³ immersion is also said to occur in a narrative script, a text⁵⁴ and in role-play,⁵⁵ because fiction is "diegesis". M. Montola simplifies demanding concepts of narratology by explaining that "a diegesis means a fictional world or the truth about what exists in a fictional world. Something within a diegesis is called diegetic, something outside it is called non-diegetic".⁵⁶ Following this perspective, immersion is the 'plunge in diegesis', be it VR, a book, *live action role playing/games* (LARP) or immersive theatre. In LARP, as in dramatic theatre, immersion is embodied, in that the *larper* physically performs that plunge: the character and the individual 'share' the same skin.

51 RADIANTI, J. et al.: A Systematic Review of Immersive Virtual Reality Applications for Higher Education: Design Elements, Lessons Learned, and Research Agenda. In *Computers & Education*, 2020, Vol. 147, No. 1, p. 2. [online]. [2023-03-30]. Available at: <<https://psycnet.apa.org/record/2020-07373-001>>.

52 LEPOURAS, G. et al.: *Anaptyxi Systimaton Eikonikis Pragmatikotitas*. Athens : Kallipos, 2015, p. 3.

53 For more information, see: HÉBERT, L.: *An Introduction to Applied Semiotics: Tools for Text and Image Analysis*. New York, NY : Routledge, 2019.

54 RYAN, M-L.: *Narrative as Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media*. Baltimore, MD : John Hopkins University Press, 2015, p. 64-66.

55 MONTOLA, M.: Role-Playing as Interactive Construction of Subjective Diegeses. In GADE, M., THORUP, L., SANDER, M. (eds): *As Larp Grows Up*. Copenhagen : Projektgruppen KP03, 2003, p. 85.

56 Ibidem, p. 82.

Immersive theatre tends to integrate the spectator, to offer embodiment in its blended universe. It invites to disconnect and inhabit its promising unique world. It brings the narrative world onstage and places spectators within it, compelling them to interact. However, it does so not through the usual narrative mode – by inviting the reader to execute the text into a ‘reality model’ – but by physically ‘realizing’ fiction *a priori* and serving it ready.⁵⁷

d) Role playing: frames, roles and the avatar

VWs such as digital role-playing games are ‘laminated’ or ‘layered’,⁵⁸ in that many different frames interact in their experiencing process. Users shift between frames, and the VW frame can be seen as a ‘keyed’ one: “Keying means the transformation of something that is already meaningful on its own terms into something that the participants will see as something different”.⁵⁹ Indeed, instead of seeing a VW as a meaningful representation or a simulation of some sort, we soon perceive it as a whole environment, a total fictional universe.

Analogue⁶⁰ and digital role-playing games, in general, are said to be a limit case between play and games, in that they lack a quantifiable outcome and a single endpoint.⁶¹ Digital role-playing games differ from digital games in that their game worlds are accessible through avatars and they require their players to play their characters in role. Role playing can be a frame of mind rather than an embedded element within the game mechanics.⁶² In avatar-based play, the environment is perceived via the vicarious body of the avatar. The principle of the avatar offers a playful and exploratory mode of being-in-the-world; it temporarily transforms our situation at the level of perception and action, allowing us to try out and struggle with new bodily spaces.⁶³ Levels of role playing in avatar-based play involve engagement in character control which can be enhanced via voice, actions and attitudes. This playing of roles may vary from mere operational character control (over-distanced role play) to holistic, ‘immersed’ role-playing, which is manifested in even getting dressed like characters and producing text or speech in role.

Immersive theatre blends physical, scenic and fictional spaces further through the promise of physically being-in-its-world. This is achieved through the invitation to become actively embodied. The spectator is offered the role of the inhabitant of that environment, a role analogous to the avatarial entity of VWs and digital role-playing games.⁶⁴ The unique

57 Remark by the authors: VR is perceptually three-dimensional, whereas immersive theatre usually literally ‘shapes’ three-dimensional environments, with the excessive use of detailed objects and labyrinth-like spatial concepts, thus attempting at remediating VR perspective.

58 GOFFMAN, E.: *Frame Analysis: An Essay on the Organization of Experience*. Boston, MA : Northeastern University Press, 1986, p. 82.

59 LINDEROTH, J.: The Effort of Being in a Fictional World: Upkeyings and Laminated Frames in MMORPGs. In *Symbolic Interaction*, 2012, Vol. 35, No. 4, p. 477.

60 Remark by the authors: Analogue role-playing games, especially tabletop but also LARP, preceded the advent of digital role-playing games. This impacted on immersive theatre; but as argued in the article, mostly through digital role-playing games and VWs, which have had a massive impact on culture altogether. Immersive theatre’s infatuation with immersion comes in a VR/VW/VE manner (detachment of spectator from the quotidian, hermeticity, multisensorial stimulation) in indication of the direct impact of VWs on immersive theatre. Besides, pervasive games andLARPs used to conceptually and morphologically overlap.; MONTOLA, M., JONSSON, S.: *Prosopopeia. Playing on the Edge of Reality*. In FRIZON, T., WRIGSTAD, T. (eds.): *Role, Play, Art: Collected Experiences of Role-Playing*. Stockholm : Föreningen Knutpunkt, 2006, p. 85-90.

61 SALEN, K., ZIMMERMAN, E.: *Rules of Play: Game Design Fundamentals*. Cambridge, MA: MIT Press, 2003, p. 81.

62 HELIÖ, S.: Role-Playing: A Narrative Experience and a Mindset. In MONTOLA, M., STENROS, J. (eds.): *Beyond Role and Play: Tools, Toys and Theory for Harnessing the Imagination*. Helsinki : Ropecon Ry, 2004, p. 65-72.

63 KLEVJER, R.: *What Is the Avatar? Fiction and Embodiment in Avatar-Based Single Player Computer Games*. [Dissertation Thesis]. Bergen : University of Bergen, 2006, p. 89-96.

64 LINDEROTH, J.: *Animated Game Pieces. Avatars as Roles, Tools and Props*. In KLEVJER, R. (ed.): *Aesthetics of Play*. Bergen : University of Bergen, 2005. [online]. [2023-03-19]. Available at: <<https://www.aestheticsofplay.org/papers/linderoth2.htm>>; JUUL, J.: The Game, the Player, the World: Looking for a Heart of Gameness. In COPIER, M., RAESSENS, J. (eds.): *Proceedings of the 2003 DiGRA International Conference: Level Up*. Utrecht : Utrecht University, 2003, p. 32-42.

performative peculiarity of immersive theatre facilitates active embodiment by means of entry into a 360° synthetic hybrid physical/fictional environment and of a promise to act, interact with it and within it with others (performers and spectators). In other words, it promises an experience in a first-person perspective analogous to the first-person digital virtual avatariar embodiment. The tendency of immersive theatre to remediate the avatar becomes evident with the adoption of a physical navigable point of view, that dislocates the spectating subject from familiar and conventional positioning, and with the provision of affordances that make sense both on a physical as well as a fictional level in the performance universe, such as touching/grasping items or opening doors.

Hence, the role-playing mode in immersive theatre indeed appears to rephrase the avatariar role playing mode within the hybrid physical/fictional world of immersive theatre. Does it succeed? It is one thing for immersive theatre to be inspired by the use of avatariar embodiment, and another to assign ergodic status and agency to the spectators that would give them access to 'mod the fiction', to author the experience. Spectators' partaking in the performance remains cognitively extra-diegetic, despite their co-presence in the same physical space as the performers, with interactivity being felt often as an illusion. Things may 'happen' to spectators, as they dance, eat, drink, are put in fridges, but their embodiment remains mostly on a somatic level. More rarely, performers genuinely co-develop fiction with the spectators. However, part of the deal of immersive theatre is actually to offer various modes of participation to the spectator, varying from full embodied participation, possibly including the co-development of fiction, to basic spectatorship in an immersive environment.

2. The digital virtual ludic/VWs characteristics under assimilation in immersive theatre

The following part of the analysis highlights VWs characteristics that have remained less assimilated in immersive theatre, such as interactivity and agency. It also underlines the strategies immersive theatre invents to renegotiate these characteristics. With the aid of these strategies, the state of imperfect assimilation, rather than leading to 'failures', gives rise to idiosyncratic performative utterances.

a) Interactivity in VWs, interactive theatre and immersive theatre

In HCI, the user is offered the power to control the computer in real-time by manipulating information which is displayed on the screen;⁶⁵ modify content and see actions instantaneously alter the mediated environment.⁶⁶ In a VWs context, the term refers to the capacity of the computer to shape the synthetic world, depending on the user's movements, actions and decisions.

L. Manovich calls for vigilance in any ontological attribution of interactivity solely to new media, as the category should be examined as applying to art forms and older media too, raising the issue of psychological interaction being rather neglected.⁶⁷ C. Wessely reminds the reader that 'interactivity' refers not only to the interaction between computer and player in determining the course of a game, but also involves the decision of *whether* and *how* the game becomes visible to the player.⁶⁸

65 MANOVICH, L.: *The Language of New Media*. Cambridge, MA : MIT Press, 2001, p. 55.

66 STEUER, J.: Defining Virtual Reality: Dimensions Determining Telepresence. In *Journal of Communication*, 1992, Vol. 42, No. 4, p. 83-84.

67 MANOVICH, L.: *The Language of New Media*. Cambridge, MA : MIT Press, 2001, p. 57.

68 WESSELY, C.: Columns of Figures as Sources of Aesthetic Illusion Browser-Based Multiplayer Online Games. In WOLF, W., WALTER, B., MAHLER, A. (eds.): *Immersion and Distance: Aesthetic Illusion in Literature and Other Media*. Amsterdam, New York, NY : Rodopi, 2013, p. 352.

Long before contemporary immersive theatre, participatory and interactive theatre invited the audience to get involved in some way in the performance,⁶⁹ to hold scenic items, make decisions on the plot, mingle with the actors and express themselves physically and orally. The 'breaking' of the fourth wall⁷⁰ was achieved through interactive theatrical and performative forms, such as *Epic Theatre*, the *Happening*, *Theatre of the Oppressed* and many more, designed to encompass the participation of the audience in the designing of the performance.

Interactive and immersive theatre partially overlap on the grounds of spectator participation, to such a degree that it feels often almost impossible to tell the difference, as there do not exist established rigid typological borders between the two. Their difference is mostly conceptual and functional. Interactive theatre invites the spectator to 'break' the fourth wall, enter the stage, or the performer to conquer the auditorium, and somehow interact. Immersive theatre intends to demolish *a priori* the fourth wall. It invites the spectator to enter, inhabit a world or the aesthetic of the work and become immersed.⁷¹ In interactive theatre, which conceptually contains a considerable degree of alienation, of critical distance, the magic circle of the stage is breached by the quotidian. In immersive theatre, the magic circle expands and becomes literal and hermetic, like that of Virtual Reality.⁷² A thematic world is usually already installed by the artists. Both theatres use spectator participation, but, interactive theatre does so in a critical or theatrical way, exploiting the distance between individual and character in order to achieve its aesthetic or political goals. Immersive theatre, on the other hand, uses spectator participation to render its world navigable, populated and experienced as 'real'. A. Alston characterizes this process as productive participation. Audience productivity in immersive theatre equals the objectification of experience as art and an entitlement "to proximate and intimate liaisons with performers or other audience members that are paid for and expected", a presumptive intimacy.⁷³

The rise of immersive theatre might be approached as the return of techniques of audience involvement familiar to the 1960s and 1970s, but this time "shorn of political imperatives and allegiances"⁷⁴ The position of change, at least in political and sociological terms, in the problematic of immersive theatre remains totally peripheral, almost irrelevant. As A. Lavender puts it: "You don't change the event, here; you merely complete it. Nor do you change yourself [...] the spectator is implicated, even incorporated, rather than emancipated."⁷⁵

b) Ergodicity

The term *ergodicity* comes from the term *ergodic*, introduced by E. Aarseth in 1997 and is used in Game Studies to describe the process of performing and shaping reading paths through cybertext. The Greek words *ergon* and *hodos*, meaning 'work' and 'path' respectively, implying the mechanical organization of cybertext, reveal that, apart from the level of cognitive performance inherent in the practice of reading, "the user of cybertext also performs in an extra-noematic sense. During the cybertextual process, the user will have effectuated a semiotic sequence, and this selective movement is a work of physical

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- 69 SHANI, H.: The Theatrical Event: from Coordination to Dynamic Interactivity. In CREMONA, V. A. et al. (eds.): *Theatrical Events: Borders, Dynamics, Frames*. Amsterdam, New York, NY: Rodopi, 2004, p. 111-114.
- 70 JULLIEN, J.: *Le théâtre vivant: Essai Théorique et Pratique*. Paris: Bibliothèque Charpentier, 1892, p. 11.
- 71 BIGGIN, R.: *Immersive Theatre and Audience Experience: Space, Game and Story in the Work of Punchdrunk*. London: Palgrave Macmillan, 2017, p. 61.
- 72 GRAU, O.: Into the Belly of the Image: Historical Aspects of Virtual Reality. In LEONARDO, 1999, Vol. 32, No. 5, p. 365-366.
- 73 ALSTON, A.: *Beyond Immersive Theatre: Aesthetics, Politics and Productive Participation*. London: Palgrave Macmillan, 2016, p. 8.
- 74 WHITE, G.: On Immersive Theatre. In *Theatre Research International*, 2012, Vol. 37, No. 3, p. 222.
- 75 LAVENDER, A.: *Performance in the Twenty-First Century: Theatres of Engagement*. London: Routledge, 2016, p. 156.

construction".⁷⁶ In other words, ergodicity is a characteristic that signifies the transformation of extra-noematic, physical movement into diegetic action. In non-ergodic literature as we know it, the effort to traverse the text signifies no extra-noematic responsibilities placed on the reader except, for example, hints of eye movement and the periodic or arbitrary turning of pages.⁷⁷ E. Aarseth concludes that cybertext resembles a labyrinth, a game, or an imaginary world, in which the reader can explore at will, get lost, discover secret paths, play around, follow the rules, and so on: "The cybertext reader *is* a player, a gambler; the cybertext *is* a game-world or world-game".⁷⁸

How true this appears to be in the case of immersive theatre, where spectators' navigation through space and choices shape their unique performance experience. Spectators appear to perform spatiotemporal, physical, cognitive and fictional choice and "find their way" as shaped through the unique path they choose to follow.

Immersive theatre is marketed as being 'interactive' but not as being 'ergodic'. However, part of what is promised with the use of the term 'immersive theatre', apart from interactive, is also ergodic. Spectators' movement and navigation aspires at becoming diegetic. This form of theatre is willing to offer all that a digital virtual world can offer, only literally within arm's reach; there is the sensation of an ergodic, virtual, cybertextual potential waiting to be actualized, in its atmospheric labyrinths, similar to those of VWs, but literally tangible in the physical world. Ergodicity in immersive theatre usually remains at a phenomenal level or is greatly constrained, even if dealt with in different ways. For example, a visit to *Houseworld*, entering rooms and interacting with the performers acquires a restricted diegetic dimension echoing a LARP performance installation practice,⁷⁹ whereas *Sleep no more* feels like "plunging inside a living movie".⁸⁰ No dynamic model, such as the one at work in VWs, may massively be embedded in the fabrication of immersive theatre performance. There is no 'recipe'. Its world is realized and the performance is set up and rehearsed in physical space, it contains room for choices, responding to or neglecting affordances but more solid-like, fully shaped, not as 'fluid' as in VWs. VWs have a Morpheus-like quality, due to the nature of the representation being bits of information *acquiring* shapes, that immersive theatre fails to imitate. Besides, a player, during an MMORPG gameplay, usually authors in real time changes in the system and for the other players. Immersive theatre spectators cannot, for example, 'mod' the performance by setting fire to an actor's wig, as the actor will not be able to carry through with the same sequence and the performance may have to stop both for diegetic as well as safety reasons. Hence, authoring a new plot path by modding a gaming world causes diegetic changes,⁸¹ whereas modding an immersive theatre performance in the same way causes also severe extra-diegetic ones.

Despite the tendency to simulate the ergodicity of VWs, not only do the paths taken in immersive theatre performances have to be predictable, safe and socially convenient, but also restricted in number so that actors may prepare for them. The best feasible case for an immersive theatre production to simulate an ergodic paradigm is to achieve, or, at least, offer the potential for a multi-linear narrative structure and looping strategy.

76 AARSETH, E.: *Cybertext: Perspectives On Ergodic Literature*. Baltimore, MD : Johns Hopkins University Press, 1997, p. 1.

77 Ibidem, p. 1-2.; Remark by the authors: However, the fact that the extra-noematic effort to read a book is thought as trivial becomes problematic. A miniscule performance still is performance. Also, all cognitive performance taking place when reading a book is physical.

78 Ibidem, p. 4.

79 Brooklyn's '*Sleep No More*' is '*Houseworld*,' *New Immersive Theater | BK Stories*. Released 15th December 2015. [online]. [2023-03-17]. Available at: <<https://www.youtube.com/watch?v=OaAtOhvIbul>>.

80 Felix Barrett on "*Sleep No More*". Released 28th July 2015. [online]. [2023-03-17]. Available at: <<https://www.youtube.com/watch?v=CKxtDQI5hfQ>>.

81 For more information, see: SCACCHI, W.: Modding as an Open Source Approach to Extending Computer Game Systems. In HISSAM, S. A. et al. (eds.): *Open Source Systems: Grounding Research. 7th IFIP 2.13 International Conference, OSS 2011*. Heidelberg : Springer Berlin, 2011, p. 62-74.

Perhaps the biggest proof that ergodicity is somehow still hindered in immersive theatre comes from the negotiation of the so-called 'blind spots'. Aarseth identifies the inaccessibility of some parts of the text also as a distinctive characteristic of cybertext. The paths not taken, the voices not heard form another world, missed in the ergodic process. This inaccessibility "does not imply ambiguity but, rather, an absence of possibility--an aporia".⁸² It could be argued that immersive theatre ergodicity attempts at becoming analogous to its digital counterpart through the step-by-step active plot-making, through navigational and interacting choices made by the spectators. However, if the concept of blind spots receives a more literal reading, this reveals them as all that the spectators choose not to do because of convention or choice. In the digital world, there are entities invested with affordances by their designers and some that on purpose are not, while in the physical world all partake in the dance of affordances "for benefit or injury".⁸³ A. Alston describes the non-diegetic experience of making a mistake in exploring space in an immersive performance.⁸⁴ These blind spots in space are not, physically speaking, totally inaccessible by spectators. Thus, the "aporia" in immersive theatre is a convention for plot to emerge safely, without malicious consequences. In digital worlds, non-diegetic spaces may not be visited by users, except perhaps for expert ones, whereas in immersive theatre they should not be visited for safety or diegesis sustainability reasons.

c) Agency

Ergodicity is often discussed along with agency. J. Murray identifies agency as "the satisfying power to take meaningful action and see the results of our decisions and choices"⁸⁵ This pleasure is discussed in relation to interaction with digital environments, where the interacting agents "can act within the possibilities that have been established by the writing and programming".⁸⁶ M. Mateas and A. Stern claim that a balance between choice and constraints is said to result in the desired sense of agency.⁸⁷ What the 'authors' of any interactive dramatic instance embed as affordances in their universes, the users perceive as terrain for exercising freedom of choice; however, simultaneously, they feel their actions are constrained by the material and formal causes (in Aristotelian terms) of that environment.⁸⁸ K. Tanenbaum et al. propose a shift from the notion of agency as representing choice or freedom, to one of agency as representing commitment to meaning.⁸⁹

According to J. Machon, in order to respond to the invitation for participation put forward by immersive theatres, explicit and/or implicit "contracts for participation" are shared between the spectator and the artist. These contacts are said to enable creative agency, involving processual interaction through the event. However, this form of agency should be understood as related to the aesthetic experience rather than having an impact on the whole performance.⁹⁰

82 AARSETH, E.: *Cybertext: Perspectives On Ergodic Literature*. Baltimore, MD : Johns Hopkins University Press, 1997, p. 3.

83 GIBSON, J. J.: *The Ecological Approach to Visual Perception*. London : Psychology Press, 1986, p. 132.

84 ALSTON, A.: Making Mistakes in Immersive Theatre: Spectatorship and Errant Immersion. In *Journal of Contemporary Drama in English*, 2016, Vol. 4, No. 1, p. 63-67.

85 MURRAY, J.: *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Cambridge, MA : MIT Press, 1997, p. 123.

86 Ibidem, p.142.

87 See: MATEAS, M., STERN, A.: Interaction and Narrative. In SALEN, K., ZIMMERMAN, E. (eds.): *The Game Design Reader: A Rules of Play Anthology*. Cambridge, MA : MIT Press, 2005, p. 642-669.

88 Ibidem.

89 For example, see: TANENBAUM, K., TANENBAUM, T. J.: Commitment to Meaning: A Reframing of Agency in Games. In PENNY, S. (ed.): *DAC 09: After Media: Embodiment and Context. Proceedings of the Digital Arts and Culture Conference, 2009*. Irvine, CA : University of California, 2009, p. 1-9. [online]. [2023-03-21]. Available at: <<https://escholarship.org/uc/item/6f49r74n>>.

90 MACHON, J.: Watching, Attending, Sense-making: Spectatorship in Immersive Theatres. In *Journal of Contemporary Drama in English*, 2016, Vol. 4, No. 1, p. 35-37.

Actions taking place within the frame of an immersive theatre performance usually follow a certain etiquette. When spectators 'do' things in immersive theatre performances, they come face-to-face with a paradox. On one hand, the fictional environment and its inhabitants, like non-player characters, are explicitly realized. They exist literally, materially; on the other, the actors' actions still retain a metaphorical dimension. This results not only in a restricted fragmental sense of agency, but to an overall 'blocked agency', exactly because the spectators' choices do not usually have an effect on the structure and conduct of the whole performance. A true cybertextual narrative comprises the undeniable impact of the user/player on it, a mark that constructs the narrative, not for *the* spectator but for *any* spectator.

It soon becomes clear that agency in immersive theatre is just a simulation of it, or everything could irreversibly be put in danger, even spectators' psychological and physical security. This results in a normalization of the spectators' choices to avoid harm or self-harm. When actors on the social stage of everyday life are invited to inhabit a fictional world, they must consent to the level of the metaphor or risk acting without being protected by a framework of action.⁹¹ Agency in immersive theatre is then inevitably different to VWs agency, where any choice designed to be accommodated within the virtual environment could be beyond an ethical dimension, without imminent or dangerous results. Nonetheless, even if immersive theatre cannot produce VWs agency experience, it simulates it.

Discussion: Immersive Theatre as a Case of Theatre Gamification

Hopefully, the comparative analysis between VWs, a prominent example of the ludic digital virtual and immersive theatre has proven so far fruitful. Immersive theatre indeed appears as having received considerable impact from the digital virtual ludic as well as rephrasing some of VWs characteristics to suit its context and practices. Such characteristics, like information intensity, have been assimilated, while others, such as ergodicity, tend to be assimilated, but have not been yet; they are dealt with idiosyncratically by theatre creators on each occasion.

Dramatic expressions and performances of the past, such as the ones occurring at folk rituals, dances, carnivals, have diachronically offered the prospect of embodied immersion for highly engaged role-players. In some avant-garde interactive experimentations, there has been space for the exploration of the spectators' literally embodied immersion (in A. Artaud's or R. Schechner's performances, for example) but that was a method rather than a genre. Theatre did not systematically aspire to offer spectators embodied immersion nor was advertising this in its name, at least not before the advent of digital media.

As said before, in immersive theatre, digital game design elements are functionally and conceptually rephrased to form a theatrical *genre*. *Gamification* should then be at work,⁹² because design elements from games are used to produce non-game experiences. The term 'gamification' signifies the use of digital game design elements in non-game

91 WILSHIRE, B.: *Role Playing and Identity: The Limits of Theatre as Metaphor*. Bloomington, IN : Indiana University Press, 1982, p. 262.

92 WALZ, S. P., DETERDING, S.: *Gameful World: Approaches, Issues, Applications*. Cambridge, MA : MIT Press, 2015, p. 7.

contexts.⁹³ The use of digital game design elements in theatre, such as the intentional or non-intentional import of elements of VWs and digital role-playing games into immersive theatre should then be considered a case of 'theatre gamification'. In this process, of course, theatre itself becomes incorporated in the ludosphere, assimilated by VWs and digital culture.

Immersive theatre brings forth the fictional by pervading the physical world. Even when VWs are experienced by spectators via goggles in an immersive theatre performance, the overall analogue frame of the physical performance encircles diegetically the use of digital technology.⁹⁴ VR, VEs and VWs on the other hand, call upon the notion of telepresence so that the users may experience embodied immersion. While VR seduces us to get immersed by getting transported 'somewhere else' (although graphically generating this 'somewhere else'), the hybrid physical/fictional entities of immersive theatre summon us to experience their presence 'right here, right now'. In the first case the users 'take the trip', in the second case the agents and entities do so and become available at an arm's reach for the spectator. It is worth examining whether or not there is a phenomenon in the field of digital gaming that could have served as a prototype for immersive theatre, at least in terms of the embodied pervasiveness of its hybrid physical/fictional entities.

'Pervasive performance', a term used by E. Pérez,⁹⁵ is used to describe a mixed-media phenomenon whose intention is to engage participants in collaborative events through a combination of game play, media and performance.⁹⁶ Pervasive games,⁹⁷ a result of the convergence of the fields of ubiquitous computing and experimental game design,⁹⁸ use digital technology but also contain a physical, analogue element, as they take place in the physical world and are performed physically by the players. Games such as *Uncle Roy All Around You*⁹⁹ by Blast Theory and *Prosopopeia* by M. Ericsson, S. Jonsson and A. Skarped, in 2005 in collaboration with IPerG project¹⁰⁰ are more on the physical side of pervasive gaming – *Prosopopeia* is also referred to as a 'pervasive LARP'.

In an attempt at tracing the genealogy of pervasive games and immersive theatre, we need to pay attention to live action role playing. M. Montola explains that a pervasive game was primarily conceived in 2000 as an 'augmented LARP game', with computing and communication technology that brings the physical and digital space together.¹⁰¹ However, pervasive gaming became separated from LARP as the former implies games that "utilize

93 See also: DETERDING, S. et al.: Gamification: Toward a Definition. In DETERDING, S. et al. (eds.): *CHI 2011 Workshop*. Vancouver : Vancouver Convention Centre, 2011, p. 1-4. [online]. [2023-03-16]. Available at: <<http://gamification-research.org/wp-content/uploads/2011/04/01-Deterding-Sicart-Nacke-OHara-Dixon.pdf>>.

94 Remark by the authors: For example, in Dotdotdot's *Somnai* (2018) wearing goggles is part of the diegesis.

95 PÉREZ, E.: *The Impact of Digital Media on Contemporary Performance: How Digital Media Challenge Theatrical Conventions in Multimedia Theatre, Telematic and Pervasive Performance*. [Dissertation Thesis]. Trondheim : Norwegian University of Science and Technology, 2016, p. 16-19.

96 PÉREZ, E.: The Expansion of Theatrical Space and the Role of the Spectator. In *Nordic Theatre Studies*, 2015, Vol. 26, No. 2, p. 40.

97 Remark by the authors: Alternate reality, augmented, location-based games are mixed-reality games.; MONTOLA, M.: A Ludological View on the Pervasive Mixed-reality Game Research Paradigm. In *Personal & Ubiquitous Computing*, 2011, Vol. 15, No. 1, p. 4.; Remark by the authors: Their participants must agree that the activities within the magic circle are interpreted 'playfully' as a part of the game, and not as part of quotidian life.; See: JONSSON, S. et al.: *Prosopopeia: Experiences from a Pervasive Larp*. In ISHII, H. et al. (eds): *ACE '06: Proceedings of the 2006 ACM SIGCHI International Conference on Advances in Computer Entertainment Technology*. New York, NY : ACM, 2006, p. 23-es. [online]. [2023-03-16]. Available at: <<https://doi.org/10.1145/1178823.1178850>>; Remark by the authors: Pervasive games are preferred in this article as a term for discussion because they constitute an umbrella term.

98 MCGONIGAL, J. E.: *This Might be a Game: Ubiquitous Play and Performance at the Turn of the Twenty – First Century*. [Dissertation Thesis]. Berkeley, CA : University of California, 2006, p. 1.

99 BLAST THEORY: *Uncle Roy All Around You*. [digital game]. Portslade : Blast Theory, 2003.

100 For more information, see: MONTOLA, M., JONSSON, S.: *Prosopopeia. Playing on the Edge of Reality*. In FRIZON, T., WRIGSTAD, T. (eds.): *Role, Play, Art: Collected Experiences of Role-Playing*. Stockholm : Föreningen Knutpunkt, 2006, p. 85-99.

101 MONTOLA, M.: *On the Edge of the Magic Circle. Understanding Role-Playing and Pervasive Games*. [Dissertation Thesis]. Tampere : University of Tampere, 2012, p. 120.

pervasive or ubiquitous computing technologies, such as wearable computers, computationally augmented artifacts and various handheld devices". E. Nieuwdorp identified this perspective on pervasive gaming as the *computing discourse*, despite the fact that only two out of ten definitions involve digital technology.¹⁰²

Pervasive games are said to expand the contractual magic circle of play spatially, temporally or socially, by bending and blurring the traditional boundaries of game, "bleeding from the domain of the game to the domain of the ordinary".¹⁰³ As 'domain of the game' we should understand everything diegetic, fictional, and as 'ordinary' everything in the quotidian, physical world. More specifically, spatial expansion refers to the breaking of the game spatial limits and expanding in the physical world. Temporal expansion is said to be at work when the in-game and out-of-game time merge in one temporal mode. The game may reach you, or you may reach the game anytime. Social expansion is of special interest here, since people who are not players of the game and may be unaware of their role in the game, become a resource for it. This social expansion may vary from "mere spectatorship to full participation in an aware or unaware state".¹⁰⁴ How close this is to efficiently describe the mode of audience involvement in immersive theatre, the ultimate aim of which is to take spectators into a level of full participation in an aware state, is a bit ambiguous at times.

Hence, immersive theatre may have assimilated and still be in the process of assimilating the digital virtual ludic characteristics, as they, for example, manifest in VWs, but also, in terms of its strategy of realizing the fictional world, immersive theatre appears to draw inspiration specifically from the phenomenon of pervasive gaming.

It is now time to consider whether or not the term 'immersive theatre' effectively conveys the mechanism at work integrated in its fabrication and deriving from digital virtual gaming and pervasive games specifically. The term suffices to reveal what immersive theatre intends to do rather what it actually does 'successfully'. Just like high or low engagement in role play, immersion is a matter of scale: one may or may not be immersed in an immersive theatre performance. Furthermore, it should also be clear that immersive theatre operates through pervasive mechanisms, 'bringing forth to life', actualizing its hybrid physical/fictional agents and entities. 'Immersive pervasive theatre' may sound too long but could be in fact more accurate.

However, even the use of the term 'theatre' should be questioned. Despite the fact that immersive theatre may be referred to as 'performance', 'experience' or 'event', in media categorizations, for example, or academic literature, the term 'immersive theatre' is prominent. True, immersive theatre feels more like a theatre performance than, let us say, a game. Why?

One possible reason could be that the presence of theatre professionals and 'stage' action is very frequent in immersive theatre – though it is not a pre-requisite, but the involvement of professionals denotes a more guaranteed aesthetic pleasure than that of amateurs or mere performers. So, one reason could be that theatre professionals do it, design it, organize it for us. And we go there as spectators, as we usually go to the theatre, a night out, a familiar social practice, only a bit different, alternative, experimental.

102 See also: NIEUWDORP, E.: *The Pervasive Discourse: an Analysis*. In *Computers in Entertainment*, 2007, Vol. 5, No. 2, p. 2-17. [online]. [2023-03-30]. Available at: <<https://doi.org/10.1145/1279540.1279553>>; For a better understanding of pervasive games, see also: MONTOLA, M.: *A Ludological View on the Pervasive Mixed-reality Game Research Paradigm*. In *Personal & Ubiquitous Computing*, 2011, Vol. 15, No. 1, p. 4.; For more information, see: KASAPAKIS, V., GAVALAS, D., BUBARIS, N.: *Pervasive Games Research: A Design Aspects-based State of the Art Report*. In CHATZIGEORGIOU, A., ELEFTHERAKIS, G., STAMELOS, I. (eds.): *PCI '13: Proceedings of the 17th Panhellenic Conference on Informatics*, 2013. New York, NY : ACM, 2013, p. 152-157.; MCGONIGAL, J. E.: *This Might be a Game: Ubiquitous Play and Performance at the Turn of the Twenty – First Century*. [Dissertation Thesis]. Berkeley, CA : University of California, 2006.

103 MONTOLA, M.: *Games and Pervasive Games*. In MONTOLA, M., STENROS, J., WAERN, A. (eds.): *Pervasive Games: Theory and Design*. Burlington, MA : Morgan Kaufmann Publishers, 2009, p. 12.

104 SVAHN, M.: *Persuasive Pervasive Games: The Case of Impacting Energy Consumption*. [Dissertation Thesis]. Stockholm : Stockholm School of Economics, 2014, p. 17-21.

Another more subtle reason could be that when the term 'immersive' is combined with the term 'theatre', the latter does not undergo any ontological transformation; the coined combo term draws upon the cognitive, conceptual space dedicated to theatre and projects it upon intermedial performative forms, thus gaining *a priori* recognition and some artistic status. Neither the nature of theatre, nor the established social practice of going to the theatre – nor the transaction it also signifies – are put under stress. For example, should the term 'immersive' be combined with the term 'game', it would directly denote a game/play instance, where artists and professionals such as actors, directors and set designers are not particularly favoured. Could the use of the term 'theatre' inhibit the realization of the fact that, although spectators may feel -and think- that they are taking part in a theatrical performance, they may instead be taking part in a game/play?¹⁰⁵ Or, on the contrary, could we conceive immersive theatre as 'immersive pervasive gaming offered by theatre professionals'?

Maybe we could, but that would signify an interaction between actors and spectators on a total level, without many blind spots, contracts and etiquette. Immersive theatre could then be seen as a 'restricted immersive pervasive gaming offered by theatre professionals'. Pérez suggests that for pervasive performance "space does not only need to be able to contain or accommodate spectators, it must also be able to support and respond to actions by spectators",¹⁰⁶ a remark that could apply to immersive theatre too. E. Klich's assignment of epistemic immersion to the experience of 'adventuring' through Punchdrunk's *Masque of the Red Death* (2007) clearly does not lack passion and enthusiasm but reveals the need for a theoretical approach, backing up empirical data.¹⁰⁷ The use of the term 'theatre' is after all prudent enough to convey the retention of a certain passivity on behalf of the spectator, like that of non-immersive theatre, changing what a scene, a stage means, while also keeping some of the traditional contract between actor and spectator alive. In immersive theatre, spectators may be tempted to do more than they can actually do. This blocked agency and ergodicity would be a dissonance, if immersive theatre was called a 'game' instead of theatre, whereas by being called 'theatre' it attains a certain air of frivolity and freedom. Hence, immersive theatre is a term that succeeds in making an ergodic and agency disadvantage appear as an advantage.

Conclusion: Towards a Neo-dramatic Theatre?

When theatre came in contact with the digital, it was affected on many levels, with the spectacular aspect easier to grasp (projections, 3D mapping). However, there have also been influences on a functional, systemic level. Immersive theatre is such a case, where the ludic digital virtual, as in VWs, affected theatre performance functionally. Such theatre constitutes a cultural paradigm of the theatre's assimilation of ludic digital virtual/VWs game design characteristics, lately also encapsulating VR technology in performance (goggles, projections, holograms).

105 Remark by the authors: Immersion has also be discussed in relation to play and games, especially with regards to role-playing practices. For an introduction to such a discussion, see: WHITE, W. J., HARVIAINEN, T., BOSS, E. C.: *Role-Playing Communities, Cultures of Play, and the Discourse of Immersion*. In TORNER, E., WHITE, J. W. (eds.): *Immersive Gameplay: Essays on Participatory Media and Role-Playing*. Jefferson, NC: McFarland, 2012, p. 71-86.

106 PÉREZ, E.: The Expansion of Theatrical Space and the Role of the Spectator. In *Nordic Theatre Studies*, 2015, Vol. 26, No. 2, p. 42.

107 KLICH, E.: Playing a Punchdrunk Game: Immersive Theatre and Videogames. In FRIEZE, J. (ed.): *Reframing Immersive Theatre: The Politics and Pragmatics of Participatory Performance*. Basingstoke : Palgrave Macmillan, 2017, p. 224.

It appears that the notions shared both by VWs and theatre, such as worldliness, immersion and interactivity have been updated because of the use of VR technology by immersive theatre. Additionally, notions unique to VWs, such as information intensity, have been transcribed within immersive theatre with a certain success. However, virtuality, agency, ergodicity and the assignment of true player status to spectators appear as problematic notions in immersive theatrical contexts and still pose challenges for creative solutions on behalf of the theatre makers. Avatarial embodiment, in particular, serves as a source of inspiration for the designing of immersive theatre performances, so that a space allowing role playing by the spectator is provided, leading to various levels of spectator participation. Passive spectatorship simulating the experience of VR, taking part in a simulation of diegetic interaction, an aware state of spectatorship or even a state of full participation¹⁰⁸ are all on the menu.

A closer look at the manifestations of the latter notions within immersive theatre crashes upon compulsive materiality and the personal responsibility of the social actor within the fictional immersive theatre world. M. Carlson explains this when contemplating immersive theatre productions, varying from what could be called promenade or polytopic productions to productions like *Sleep No More*, which offer "a collection of decorated spaces through which the audience is free to wander as they choose [...] occasionally an actor will pull an audience member into a private space and speak to them intimately. Not all audience members have this experience, and those that do can neither initiate the experience nor change it. The actor remains in complete control".¹⁰⁹

Hence, the presence of VWs criteria to such a degree in immersive theatre qualifies it as a case of theatre gamification, drawing inspiration specifically from pervasive gaming. However, where immersive theatre does differ from pervasive gaming, through the use of the term 'theatre' in its name, is the generic exclusion of the unaware state of participation of the spectator. Theatre overall pre-requires the aware role of the spectator. The Invisible Theatre paradigm does not suffice to subvert the established role of the aware but passive spectator. Examples of immersive theatre performances that are designed on the basis of the unaware mode of spectators' participation are definitely worth examining. Such an example of an immersive theatre practice would shed even more light on the relationship between pervasive games and immersive theatre, but would also pose a challenge for accuracy in the use of terminology, conveying what could effectively signify an 'immersive pervasive gaming performance'.

Aspirations for embedding a performative interactive, ergodic dynamic model inspired by VWs within the central performative strategy of immersive theatre draws it away from traditional theatre, not towards the post-dramatic, but towards what we could call a *neo-dramatic*.¹¹⁰ In the middle between dramatic and ergodic, a 'dramatic-wanna-be-ergodic', gamified theatre. In other words, towards a dramatic that has had the impact of VWs imprinted on it.

In conclusion, immersive theatre has been affected by VWs and creatively reproduces this impact. It may have lost part of the power of theatre, its metaphorical capacity to transform, as, by assimilating VWs, it also inevitably assimilates part of the actualized nature

108 SVAHN, M.: *Persuasive Pervasive Games: The Case of Impacting Energy Consumption*. [Dissertation Thesis]. Stockholm: Stockholm School of Economics, 2014, p. 21.

109 CARLSON, M.: Postdramatic Theatre and Postdramatic Performance. In *Revista Brasileira de Estudos da Presença*, 2015, Vol. 5, No. 3, p. 587-588.

110 Remark by the authors: The term neo-dramatic has been used before to signify a shift in post-late 20th century dramatic writing.; SIDIROPOULOU, A.: The Challenge of Neo-dramatic Writing in the Anglo-Saxon Theater. In *Gamma: Journal of Theory and Criticism*, 2009, Vol. 17, No. 1, p. 93-95.; Remark by the authors: It is here used in a different perspective, referring mostly on immersive theatre infatuation with VWs and its aspiration at performing immersive interactivity, ergodicity and agency.

of the digital virtual, rendering it physical and suffocatingly 'real'. What in theatre appears to be virtual, a knot of tendencies in all respects, in immersive theatre is already resolved right from the start, awaiting for the spectator to be virtualized. Issues referred to earlier, such as those occurring with agency and ergodicity, stand in the way of its full virtualization. In the theatre gamification process, theatre may be losing depth but gaining a wider spectrum for experimentation. As theatre intertwines further with digitality, a new space for dialogue between the analogue and the digital prevails. This dialogue could lead to a revision of the theatrical communicational transaction between performer and audience as well as new dramatic, theatrical, performative and gaming mixed reality phenomena, whose quality may not be proven as 'artistic' or marketed as such, but as experimental and playful. 'Playful expression' may make more sense as a frame for generating and exploring new intermedial forms, rather than the tendency to classify hybrid, performative phenomena located between theatre and gaming as 'cutting edge theatre'.

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The Role of Digital Marketing in the Esports Industry

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ABSTRACT:

The eSports industry, supported by the accelerated development of digital technologies, is becoming more and more interesting to companies, as a potential place where products and services can be advertised. Given that consumers, who follow or actively engage in playing digital games and eSports, are mostly younger men, digital marketing strategies seem like a logical choice. This paper provides several theoretical viewpoints on the function of digital marketing in the industry of eSports. The authors attempted to make this topic more accessible to professionals with expertise in this field by assessing the views of 113 respondents and highlighting the possible advantages of adopting digital marketing in the eSports industry. The aim of this study is to show that companies should focus on promoting brands on digital platforms dedicated to eSports, because such activities, which are intended for players and audiences, are generally acceptable activities of business entities. Also, when carrying out brand promotion on these platforms, it is advisable to hire credible eSports influencers on social media to recommend their brands, and ultimately, to support the spread of eWOM about the company's brand.

KEY WORDS:

consumers, digital games, digital marketing, eSports industry, eSports influencers, eWOM.

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Introduction

With the development of digital technologies, a whole set of new digital marketing tools have appeared, which enable companies in the modern environment to operate more efficiently and reduce costs, but also enable them to communicate more accurately and adequately with their target market, which enables the establishment of an emotional connection in the brand-consumer relationship.¹ The rise of eSports has made the future of digital marketing much more optimistic. Today, many world-famous brands are investing in eSports, and different digital marketing strategies can be seen within this industry. This trend is certainly not surprising, if we consider that in 2020 there were close to half a billion people who watched eSports on streaming platforms, or on their television sets. By 2025, eSports is expected to have 640.8 million viewers worldwide, which is certainly a sign that its audience is rapidly increasing.² Also, according to estimates, revenues in the global eSports market will exceed 2 billion USD by 2025.³

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- 1 BALTEZAREVIĆ, R., RAVIĆ, N.: Sinteza između digitalnih marketinških strategija i strategija u igri šah. In *Baština*, 2020, Vol. 29, No. 52, p. 228.
 - 2 GOUGH, Ch.: *eSports Audience Size Worldwide from 2020 to 2025*. Released on 22nd March 2023. [online]. [2023-05-13]. Available at: <<https://www.statista.com/statistics/1109956/global-esports-audience/>>.
 - 3 GOUGH, Ch.: *eSports Market Revenue Worldwide from 2020 to 2025*. Released on 3rd May 2023. [online]. [2023-05-13]. Available at: <<https://www.statista.com/statistics/490522/global-esports-market-revenue/>>.

Investing in digital marketing activities, within the eSports industry, can be considered a very effective way for a company to communicate with its consumers.⁴ The audience for eSports is mainly young adult men (between 17 and 25 years old), who are passionate about digital technology and digital games, which is essential information in the process of planning a digital marketing strategy and how to communicate with the target market.⁵ It is believed that there are two main factors in the rapid development of eSports. The first is certainly the ever-growing popularity of digital games in general, and the second factor is the constant change and development of technology.⁶ eSports can provide a company with a quick entry into a new market, rebrand and provide a new positioning of products or services, but also stimulate the sale of goods. All this, along with increasing turnover, can lead to better competitiveness and functioning of the company's activities.⁷

Today, many cities are racing to host eSports competitions because they can stimulate economic growth and employment. In Atlanta, which is considered the capital of eSports and an example of a city that has capitalized on the growth of eSports, hosted an eSports event in 2019 which was attended by 35,000 players and audience members. This event employed 12,000 workers and had a positive economic impact of half a billion USD.⁸ The eSports industry is increasingly incorporating virtual reality (VR) and launching more VR-only leagues (such as the VR league). In order for eSports to reorient itself towards VR in the future, and to offer players experiences similar to those in real life, much still needs to happen. First of all, problems such as the broadcasting of such VR tournaments must be solved. Perhaps one of the biggest problems is the fact that virtual reality systems are extremely expensive and not everyone (at least for now) can afford them. Finally, virtual reality in eSports requires more physical activity from players, which nevertheless appeals to a different demographic, than is the case with today's eSports, which are played on computers and consoles.⁹

However, the phenomenon of eSports constantly shows its ability to develop and evolve, and experts predict that in a few years it will become the most profitable financial industry. The eSports industry is becoming increasingly powerful, and therefore an ideal place for effective consumer persuasion, which can and must be used, first of all, for marketing purposes.¹⁰

Esports: Definition and Conceptualization

A general definition of eSports is quite difficult to produce because eSports is not a 'normal' sport. It consists of several components such as technology, sports, business,

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- 4 SUŃGA, C. A.: *The Rise of Esports (And How It Affects Digital Marketing)*. Released on 11th March 2021. [online]. [2023-05-15]. Available at: <<https://www.oom.com.sg/the-rise-of-esports-and-how-it-affects-digital-marketing/>>.
 - 5 BALTEZAREVIĆ, R., BALTEZAREVIĆ, I.: Uloga instagrama u poslovanju mladih. In *Megatrend Revija*, 2021, Vol. 18, No. 2, p. 23.
 - 6 SEO, Y.: Electronic Sports: A New Marketing Landscape of the Experience Economy. In *Journal of Marketing Management*, 2013, Vol. 29, No. 13-14, p. 1544.
 - 7 ALTON, L.: *How Big Will ESport Really Get?*. Released on 12th September 2019. [online]. [2023-04-18]. Available at: <<https://community.connection.com/how-big-will-esports-really-get/>>.
 - 8 DUNN, J.: *The Rise of Esports*. Released on 24th August 2022. [online]. [2023-03-08]. Available at: <<https://www.stlouisfed.org/open-vault/2022/aug/rise-of-esports-industry>>.
 - 9 BRYAN, Y.: *Can Virtual Reality and Esports Coexist?*. Released on 14th May 2023. [online]. [2023-05-14]. Available at: <<https://readyesports.com/vr-and-esports/>>.
 - 10 BALTEZAREVIĆ, R. et al.: Political Marketing in Digital Games: 'Game Over' for Traditional Political Marketing Methods. In *Acta Ludologica*, 2019, Vol. 2, No. 2, p. 38.

and unlike e.g., baseball or ice-hockey, combines multiple platforms together.¹¹ Not to be confused with recreational digital gaming (playing for fun), eSports is organized competitive digital gaming typically played via a game console, computer, or mobile device.¹² A broader definition for the eSports industry based on W. Collis' model of the entire eSports ecosystem divides eSports revenue into six categories: (a) teams, professionals and streamers, (b) streaming platforms, (c) game publishers, (d) physical products, (e) leagues and tournaments, and finally (f) digital tools. All these sectors overlap and, in some way, represent eSports.¹³ Approximately 8 million people stream content on Twitch today. Over 1.3 trillion minutes of video were viewed by Twitch users last year. This interactive live streaming service had an annual average of nearly 2,500,000 concurrent viewers in 2022. North America and Asia currently have the largest eSports markets. The Latin American region is expected to have 130 million gamers and eSports viewers by the year 2025. China leads the way in terms of eSports participation. The eSports industry has a 47% engagement rate among Chinese citizens.¹⁴

In the late 1990s, South Korea was the first country to recognize eSports as an official sport. The Korean Esports Federation was extremely active during that period in trying to get official eSports recognition from various nations around the world. Currently, eSports is recognized as a sport in many countries, such as China, Italy, South Africa, Russia, Nepal, Finland, Denmark and the USA. Competitive gaming has developed a huge fan base and is under consideration to make its official debut as a discipline at the 2024 Paris Olympics.¹⁵ If we compare traditional sports tournaments with eSports tournaments, we can conclude that the construction behind them is quite similar. Esports teams are also built much like normal sports teams. First of all, there is the owner of the team, and behind the team is the management that organizes trips, league matches or tournaments. Viewership of eSports is also extremely high, due to the fact that it is hosted online, thus allowing easy access for everyone. One platform on which it is broadcast is ESPN (an American cable sports channel).¹⁶ Through several platforms, such as YouTube or Twitch, eSports gamers have the ability to broadcast their games and communicate directly with their audience in a digital environment. The eSports championships "Worlds" showed the great popularity of competitive games with a viewing rate of over 32 million people.¹⁷

In the sea of eSports streamers and players, those who stood out as the most prominent, and therefore the most interesting for companies to hire to promote their brands, in top five order are (highest followed Twitch streamers): Ninja (Tyler Blevins) with 16.9 million followers, Tfue (Turner Tenney) 10 million followers, Shroud (Michael Grzesiek) 9 million followers, Rubius (Ruben Doblas) 8.2 million followers and XQC (Felix Lengyel) with 7.6 million followers. Felix Lengyel is also considered to be the streamer who earns the most on the platform (it is estimated that he has earned more than 2 million USD to date). On the other hand, the highest paid eSports player is N0tail (Johan Sundstein), a Team OG player, who earned over 7 million USD.¹⁸

11 JENNY, S. E. et al.: eSports Venues: A New Sport Business Opportunity. In *Journal of Applied Sport Management*, 2018, Vol. 10, No. 1, p. 35.

12 Ibidem.

13 For more information, see: COLLIS, W.: *The Book of Esports*. New York, NY : RosettaBooks, 2020.

14 RUBY, D.: *44+ eSports Statistics for 2023 (Trends, Facts & Insights)*. Released on 10th March 2023. [online]. [2023-06-02]. Available at: <<https://www.demandsage.com/esports-statistics/>>.

15 DIFRANCISCO-DONOGHUE, J., BALENTINE, J. R.: Collegiate eSport. In *Current Sports Medicine Reports*, 2018, Vol. 17, No. 4, p. 117-118.

16 KANE, D., SPRADLEY, B. D.: Recognizing eSport as a Sport. In *The Sports Journal*, 2017, Vol. 13, No. 1. [online]. [2023-04-04]. Available at: <<https://thesportjournal.org/article/recognizing-esports-as-a-sport/>>.

17 DIFRANCISCO-DONOGHUE, J., BALENTINE, J. R.: Collegiate eSport. *Current Sports Medicine Reports*, 2018, Vol. 17, No. 4, p. 117-118.

18 JAIN, K.: *The Inspiring Evolution & Growth Of eSports*. Released on 20th June 2021. [online]. [2023-03-08]. Available at: <<https://www.iuemag.com/u21/ed/the-inspiring-evolution-growth-of-esports>>.

The expansion of eSports around the world has drawn the attention of educational practitioners and researchers. In the United States alone, the number of high schools participating in eSports is 1200, which is six times more than in previous years.¹⁹ Engaging in eSports can provide students with opportunities to learn basic life skills, such as communication, coordination, and team cohesion, but also to develop more general transferable abilities such as critical thinking skills and technological competence. In any case, eSports is a sphere in which an individual's skills are likely to reflect well on playing success. Many universities today offer eSports scholarships to students who are ready to compete and pursue their passion in the technology field.²⁰

Digital Marketing in the Esports Industry

The development of digital technology has changed the way we buy, sell, socialize, manage our health, learn and have fun.²¹ Of course, digital media for mass communication are increasingly used in business as well,²² with their help, more efficient, more direct, faster, and cheaper communication with consumers is possible. Esports events that are broadcast live on the Internet and television channels and attract huge audiences are an excellent marketing tool for promoting company brands. Furthermore, according to research conducted by eSports streaming platform Twitch, the eSports audience is considered extremely engaged and loyal, with 90% of fans being able to recall at least one non-gaming sponsor within eSports.²³ Heat mapping and eye tracking technology is used to measure and predict the reality of visual engagement.²⁴ Companies using eSports today provide access to 21- to 35-year-old consumers anywhere in the world. The audience is growing at a rapid rate. A few years ago, the number of spectators at the finals of the League of Legends World Championship (commonly abbreviated as 'Worlds') exceeded the number of people watching the finals of the NBA season.²⁵ The final match of the 'Worlds' had almost 100 million viewers.²⁶ Many global companies have begun to pay more attention to this industry and its incredible marketing potential, primarily due to the huge audience of eSports competitions.²⁷

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- 19 HENNICK, C.: *eSports Programs Start to Pop up in K-12 Schools*. Released on 11th January 2019. [online]. [2023-03-08]. Available at: <<https://edtechmagazine.com/k12/article/2019/01/eSports-programs-start-pop-k-12-schools>>.
- 20 PLUSS, M. et al.: *eSports: The Chess of the 21st Century*. In *Frontiers in Psychology*, 2019, Vol. 10, No. 1, p. 4. [online]. [2023-04-04]. Available at: <<https://doi.org/10.3389/fpsyg.2019.00156>>.
- 21 SAFIEDDINE, F., BALTEZAREVIĆ, R.: *Advances in Technologies Evolving New Dimensions in E-Society*. In BALTEZAREVIĆ, V., BALTEZAREVIĆ, R., BALTEZAREVIĆ, B. (eds.): *The Internet as a Tool of Modern Business and Communication*. Saarbrücken : Lap Lambert Academic Publishing, 2016, p. 43.
- 22 BALTEZAREVIĆ, R., BALTEZAREVIĆ, I.: *The Role of Personal Branding in the Digital Environment on Career Development During the Covid-19 Pandemic*. In ĐORĐEVIĆ, B. (ed.): *The Impact of the Covid 19 Pandemic on Economy, Resources and Sustainable Development*. Belgrade : Faculty of Management Zaječar, Megatrend university Belgrade, 2022, p. 186.
- 23 MURPHY, M.: *Why Big Brands NEED to Shift Their Focus to eSports*. Released on 19th December 2018. [online]. [2023-05-14]. Available at: <<https://medium.com/instant-sponsor/why-big-brands-need-to-shift-their-focus-to-esports-4deb6a1dea31>>.
- 24 BIRMINGHAM, A.: *Cover Story: The Business of Gaming Will Reshape Marketing, Technology*. Released on 7th December 2022. [online]. [2023-03-08]. Available at: <<https://www.digitalnationaus.com.au/video/cover-story-the-business-of-gaming-will-reshape-marketing-technology-588682>>.
- 25 DAVIS, J.: *eSports Industry Has Unique Opportunity for Sports Expansion*. Released on 6th May 2020. [online]. [2023-05-15]. Available at: <<https://esportsinsider.com/2020/05/esports-sports-expansion/>>.
- 26 MURPHY, M.: *Why Big Brands NEED to Shift Their Focus to eSports*. Released on 19th December 2018. [online]. [2023-05-14]. Available at: <<https://medium.com/instant-sponsor/why-big-brands-need-to-shift-their-focus-to-esports-4deb6a1dea31>>.
- 27 HALLMANN, K., GIEL, T.: *eSports – Competitive Sports or Recreational Activity?*. In *Sport Management Review*, 2018, Vol. 21, No. 1, p. 16.

Advertising during the online broadcast of major eSports events has become a widespread practice. So, for example, the highest number of simultaneous viewers during the international competition, The International (Dota 2 Championships) event – (in 2018) had 1.2 million viewers worldwide,²⁸ while in 2022 the same event, which was held in Singapore, had 1.7 million concurrent viewers.²⁹ A few years ago, the Coca-Cola company announced a partnership with Riot Games, the organizer of the most popular eSports competition in the world in playing the game League of Legends – ‘Worlds’, and became a sponsor of the Challenger Series, a newly created professional league that is held every year. According to Coca-Cola’s internal research, after only one year of cooperation, this company has become the ‘number one’ (FMCG – fast moving consumer goods) brand associated with the ‘Worlds’. The study showed that about 80% of the players expressed an optimistic mood regarding this sponsorship campaign.³⁰ Another study, conducted to better understand how eSports fans perceive the existence of brands in eSports, whether playing, watching, or both, found that 85% of study participants expressed positive agreement with the following statements: “I always appreciate when brands try to reach me through the gaming world. [...] I might even be more likely to buy from them in the future [and] I usually appreciate when brands try to reach me through the gaming world, but it has to be done right”.³¹

Digital games and technologies are becoming an integral part of the market and now we can see a tendency for large multinational companies to enter this market and sometimes organize their own tournaments, such as the Mountain Dew League. The company Mercedes, which mainly manufactures luxury cars, sponsors major tournaments hosted by ESL, also provides its S-class cars for the best eSports players. Of course, IT companies are the ones who find this market the most interesting and have already occupied a large segment.³² Esports is a huge business for them, and the biggest IT/computer industry sponsors today, HP and Intel, were among the first to start sponsoring eSports events. Competing players play digital games exclusively on these companies’ computers.³³ It is an interesting fact that today 55% of the brands that support the gaming and eSports sector are not directly related to games and, moreover, 94% of the companies that sponsor events, teams, players or competitions are not companies that are directly related to the gaming (or eSports) industry.³⁴ Almost three-quarters of eSports revenue comes from advertising and marketing that brands invest in eSports events.³⁵ A study conducted by A. Elasmir-Ejjaberi, S. Rodriguez-Rodriguez and P. Aparicio-Chueca showed that sponsoring an eSports league has a very positive effect on a sponsor’s brand by influencing consumers to be more aware of the sponsor’s brand communication actions, thus getting to

28 Newzoo Global Esports Market Report 2020 / Light Version. Released on 25th February 2020. [online]. [2023-05-14]. Available at: <<https://newzoo.com/insights/trend-reports/newzoo-global-esports-market-report-2020-light-version/>>.

29 ŠIMIĆ, I.: The International 2022 Becomes the Third Most-watched Dota 2 Event Ever. Released on 31st October 2022. [online]. [2023-05-16]. Available at: <<https://esportsinsider.com/2022/10/the-international-2022-third-most-watched-dota-2-event-ever>>.

30 OZANIAN, M., SETTIMI, C., PEREZ, M.: *The World’s Most Valuable eSports Companies*. Released on 23rd October 2018. [online]. [2023-05-15]. Available at: <<https://www.forbes.com/sites/mikeozanian/2018/10/23/the-worlds-most-valuable-esports-companies-1/#1d3194396a6e>>.

31 ROSENBERG, D.: *eSports Marketing: Start with the Consumer*. [online]. [2023-05-19]. Available at: <<https://sports.cioreview.com/cxinsight/esports-marketing-start-with-the-consumer-nid-24249-cid-107.html>>.

32 DAVIS, J.: *eSports Industry Has Unique Opportunity for Sports Expansion*. Released on 6th May 2020. [online]. [2023-05-15]. Available at: <<https://esportsinsider.com/2020/05/esports-sports-expansion/>>.

33 ERICKSON, B. et al.: *eSports: Business Models, How an eSport Team Makes Money*. 2021. [online]. [2023-05-16]. Available at: <<https://mercercapital.com/article/esports-business-models-article/>>.

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know the brand better. Also, in this way the image of the particular brand is strengthened. Finally, those consumers who claim to know about the sponsored eSports competition are better able to characterize the brand.³⁶ Sponsoring an eSports team means that the company is responsible for some of the team's expenses in exchange for positive publicity and brand awareness. Companies that opt for this strategy usually have their logo on the uniforms of the players or the teams agree to consume their product whenever they are in front of the media. In this way they keep their brand fresh in the minds of their consumers. Companies such as Twitch, Red Bull, and Puma regularly sponsor eSports teams at competitions, in this way, they want to remind consumers that their favourite brands support eSports. However, this strategy is not recommended for smaller companies, which are not so internationally known. Other marketing strategies, such as advertisements describing their services or products, are a much more acceptable option.³⁷

Companies are increasingly using digital games to connect with their consumers, due to the fact that the eSports industry is showing an upward trend.³⁸ Influencer marketing has become very popular in recent years, according to estimates, close to 90% of marketers are currently using an influencer marketing plan to increase or maintain their investment.³⁹ Companies are aware that successful eSports players are also influencers who are perceived by their followers as credible sources of information. As such, in direct communication with consumers (during video streams) they can directly or indirectly influence consumer purchasing decisions. Among the marketing activities, if demographics are taken into account (18-24 age group), the endorsement of athletes and celebrities is the most effective marketing strategy.⁴⁰ In addition to engaging eSports influencers, the suggestion for companies is to select and optimize the best social channels (such as Twitch, YouTube Gaming, Hitbox and GosuGamers). Also, starting a company's own eSports team to promote paid advertising for their brands can be a very useful digital marketing strategy in the eSports industry. Furthermore, the creation of partnerships would allow access to an even larger audience and if the partner is carefully chosen, it can have a positive impact on the credibility of the brand.⁴¹ For example, Red Bull, Samsung and Hershey are some of the brands that have partnered with Ninja, the most followed gaming streamer on Twitch.⁴² Organizing team events, mini-tournaments, giving gifts to consumers, promoting social responsibility, along with precise and timely creation and posting of content on social networks, can further improve consumer perception of the brands represented by these companies. If consumers are satisfied with a product or service, they will continue to spread the word-of-mouth (WOM) to other Internet users. This kind of communication in a digital environment is known as *electronic word-of-mouth* (eWOM). And very often it can have a viral effect, that is, the content posted by one user (company, influencer or ordinary internet user) is multiplied exponentially through cyber

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space (reposted at high speed). It describes any positive or negative statement made by current or potential consumers about an organization or its products using the Internet. This concept can appear in various environments such as discussion forums, weblogs, review websites and social networking sites, where consumers can post their comments, opinions and reviews regarding products and services.⁴³ Technological flexibility enables the expression of eWOM content (in forms such as opinions, online ratings, feedback, reviews, comments and online experience sharing) not only using textual information, but also using rich multimedia such as images, videos and animations. eWOM is not limited to geographical boundaries, does not disappear with time, and it can be said that the duration of eWOM content is infinite. Content is not deleted at regular intervals, unless there are legal issues related to it.⁴⁴ Electronic word-of-mouth differs from traditional WOM because it offers a higher speed of message transmission between users, with messages available online and visible at any time. However, eWOM can also have a negative impact on the credibility of information, as information communicators and information recipients are sometimes anonymous.⁴⁵

Whether players will decide to play a game or watch a streamer is influenced by emotional factors, such as the desire to improve game playing skills, or simply sympathy for the player, who streams while playing a certain game, as well as material factors (because often streamers receive free digital bonuses in various games).⁴⁶ Key factors for the growth of eSports are social media platforms that provide users with easy access and no location-related boundaries.⁴⁷ In recent years, access to competitive entertainment has gradually shifted from television to the Internet. Streaming platforms, which allow audiences to watch digital games in real time, have become important and for this reason eSports organizations are trying to incorporate streaming into their digital marketing strategies to influence consumer purchasing decisions. Also, they allow consumers to create new content, socialize around it, and thus, reduce the distance between consumers and producers.⁴⁸ One study showed that 55% of young internet users want to engage with their favourite brands through social apps,⁴⁹ which is information that confirms the justification of such a digital approach to consumers. Gaming brands are increasingly developing their digital strategies. A multi-channel approach and data analytics to gain a better understanding of consumers are believed to be key factors in driving long-term growth.⁵⁰ In-game advertising can be a powerful and unique marketing strategy. With this strategy, it is possible to differentiate a brand from the competition, increase brand awareness and collect precise data on consumers.⁵¹

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Marketing investment in eSports leagues is much cheaper in terms of impact per viewer than traditional sports. As for the investment risk, it is lower if the brand sponsors the competition. Companies in the industry rightly believe that investing in eSports will result in more fans mass- watching the teams play on TV and the Internet, which will lead to them buying products associated with the brand.⁵² The eSports market revenue globally reached around \$1.8 billion in 2022.⁵³ In the coming years, based on the revenue model, the global eSports market that includes media rights, merchandise, tickets, advertising and sponsorships is predicted to grow at a CAGR (compound annual growth rate) of 22% by 2030 (representing the largest market share).⁵⁴ Such predictions and the potential of the eSports industry will certainly not remain under the radar of global companies. The growing cultural influence of eSports and gaming, with its massive reach, interactivity and frequency, presents many advertising opportunities for brands. On a global level, games and eSports already enjoy the interest of some of the biggest brands in all sectors, such as Intel, Monster, Red Bull, Pepsi, MTV, etc. Average advertiser spending growth of 30 percent annually in this industry implies that gaming companies are constantly expanding and can reach a diverse audience. The introduction of Web3/Metaverse-related innovations in the gaming ecosystem will enable players to experience new virtual forms of entertainment.⁵⁵

In the near future, marketing experts may also include sensory marketing strategies in the digital environment. Haptic gloves will make it possible to touch virtual objects and feel their texture, while the sense of smell will be stimulated with special headphones that will cover the consumer's nose, and when the user interacts with the object (product), the scents in the cartridges of this device will be activated. In this way, consumers' senses will be stimulated, almost as in a real environment. This approach will cause emotions in consumers, which will have a positive effect on their purchasing decisions. With the development of VR (virtual reality), players can really communicate with each other almost as in real life. The possibilities are now at such a level that a user can punch a person or give 'high five'. It is undeniable that VR games add a new dimension to the world of competitive gaming.⁵⁶

Methodological Framework

In order to carry out research for the needs of this paper, we created a close-ended questionnaire that consisted of two parts: in the first part, we asked for data on the sex, age, and education of the respondents, and asked for an answer to the question whether the respondents are players or part of the audience? The second part contained 15 statements

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that were defined with the intention of ascertaining the attitudes of the respondents. The questionnaire was sent to 248 electronic addresses that are contained in the database of the Megatrend University in Belgrade, Serbia. These are the addresses of students and former students, as well as teaching staff of the University. After receiving answers from respondents, we used a total of 113 completed questionnaires for processing through SPSS software. In order to conduct empirical research, we defined three research questions that are based on the theory that we analysed in this paper:

- RQ1: Is the promotion of brands on digital platforms intended for eSports acceptable to players and audiences?
- RQ2: Should companies hire credible eSports social media influencers to recommend their brands as part of their campaign?
- RQ3: Do companies that want to advertise their brands through digital marketing have to strive to achieve positive eWOM communication?

Results

Based on the conducted analysis, we concluded that the survey included 67 (59.3%) male respondents and 46 (40.7%) female respondents. As for their age structure, most of the respondents belong to the youngest age group of 18-25 years, a total of 41 (36.3%). The majority of the respondents have college education - 54 (47.8%).

The next question that is of particular importance for this research was the question of whether the respondents participate in playing digital games from the field of eSports, that is, are they players or part of the audience? Based on their answer, we conclude that 18 (15.9%) of the respondents are players, while 95 (84.1%) declared that they are part of the audience. Further analysis shows the following characteristics of players and audiences:

- Table 1 shows that of the total number of respondents, 18 (15.92%) are players and 95 (84.08%) are part of the audience. In relation to the gender structure, 57 male respondents are part of the audience and 10 are players, 38 female respondents are part of the audience and 8 are players;
- Table 2 gives us the information that the majority of players are from the age group 26-35, 7 of them (38.8%);
- Table 3 shows that most players have a college education, 7 (38.8) of them.

Table 1: Gender * Audience/Player

Gender		Audience	Player	Total
Gender	Male	57	10	67
	Female	38	8	46
Total		95	18	113

Source: own processing

Table 2: Age * Audience/Player Crosstabulation

Age		Audience	Player	Total
Age	18-25	37	4	41
	26-35	21	7	28
	36-45	3	4	7
	46-55	17	3	20
	56-65	17	0	17
Total		95	18	113

Source: own processing

Table 3: Education * Audience/Player Crosstabulation

Education		Audience	Player	Total
Education	Primary school	1	0	1
	High school	20	9	29
	College education	47	7	54
	Master	25	1	26
	Doctorate	2	1	3
Total		95	18	113

Source: own processing

We tested all three research questions using statements for which we asked the respondents to express their views by providing answers on a modified Likert scale from 1 to 5. RQ1:

- Table 4 shows that 49 (43.4%) respondents agree with the statement and 4 (3.5%) strongly agree;
- Table 5 provides the answer about the acceptance of the statement for testing RQ1 in relation to whether the respondent is a player or an audience member. 41 (43.15%) respondents said they agree with the statement, out of a total of 95 respondents belonging to the audience segment, and 8 (44.4%) out of a total of 18 players. 4 of them (4.2%) from the audience segment stated that they strongly agree with the statement, and none from the player's segment.

RQ2:

- Table 6 shows that 46 (40.7%) respondents agree with the statement and 9 (8.0%) strongly agree;
- Table 7 gives the answer about the acceptance of the statement for testing RQ2 in relation to whether the respondent is a player or an audience member. 39 (41.05%) out of a total of 95 respondents belonging to the audience segment and 7 (38.8%) out of a total of 18 players agreed with the statement. Strongly agree 8 (8.42%) from the audience and 1 (5.55%) from the player's segment.

Table 4: Attitudes of respondents to the statement that tests RQ1

RQ1				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	8	7.1	7.1	7.1
Disagree	28	24.8	24.8	31.9
Neither agree nor disagree	24	21.2	21.2	53.1
Agree	49	43.4	43.4	96.5
Strongly agree	4	3.5	3.5	100.0
Total	113	100.0	100.0	

Source: own processing

Table 5: RQ1 * Audience/Player Crosstabulation

RQ1				
		Audience	Player	Total
RQ1	Strongly disagree	7	1	8
	Disagree	23	5	28
	Neither agree nor disagree	20	4	24
	Agree	41	8	49
	Strongly agree	4	0	4
Total		95	18	113

Source: own processing

Table 6: Attitudes of respondents to the statement that tests RQ2

RQ2				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	14	12.4	12.4	12.4
Disagree	14	12.4	12.4	24.8
Neither agree nor disagree	30	26.5	26.5	51.3
Agree	46	40.7	40.7	92.0
Strongly agree	9	8.0	8.0	100.0
Total	113	100.0	100.0	

Source: own processing

Table 7: RQ2 * Audience/Player Crosstabulation

RQ2		Audience	Player	Total
RQ2	Strongly disagree	13	1	14
	Disagree	10	4	14
	Neither agree nor disagree	25	5	30
	Agree	39	7	46
	Strongly agree	8	1	9
Total		95	18	113

Source: own processing

RQ3:

- Table 8 shows that 36 (31.9%) respondents agree with the statement and 4 (3.5%) strongly agree;
- Table 9 gives the answer about the acceptance of the statement for testing RQ3 in relation to whether the respondent is a player or an audience member. 27 (28.4%) out of a total of 95 respondents belonging to the audience segment and 9 (50.0%) out of a total of 18 players agreed with the statement. Strongly agree - 4 (4.21%) from the audience segment and none from player's segment.

Table 8: Attitudes of respondents to the statement that tests RQ3

RQ3				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	13	11.5	11.5	11.5
Disagree	29	25.7	25.7	37.2
Neither agree nor disagree	31	27.4	27.4	64.6
Agree	36	31.9	31.9	96.5
Strongly agree	4	3.5	3.5	100.0
Total	113	100.0	100.0	

Source: own processing

Table 9: RQ3 * Audience/Player Crosstabulation

RQ3		Audience	Player	Total
RQ3	Strongly disagree	10	3	13
	Disagree	25	4	29
	Neither agree nor disagree	29	2	31
	Agree	27	9	36
	Strongly agree	4	0	4
Total		95	18	113

Source: own processing

Given that the results of the research indicated that there is no significant difference in the opinions expressed by the respondents in relation to whether they belong to the audience or to the players, we performed a check using the T-test of independent samples, which confirmed this assumption:

- RQ1: (Sig. .795, $p > .05$), Mean difference .071 (Lower: .466, Upper: .608). The result indicates that there is no statistically significant difference between the attitudes of the players and the audience;
- RQ2: (Sig. .520, $p > .05$), Mean difference .033 (Lower: .554, Upper: .621). The result indicates that there is no statistically significant difference between the attitudes of the players and the audience;
- RQ3: (Sig. .860, $p > .05$), Mean difference .050 (Lower: .605, Upper: .506). The result indicates that there is no statistically significant difference between the attitudes of the players and the audience.

Discussion and Conclusion

In the near future, companies will achieve a great competitive advantage if they recognize the huge opportunities of the eSports industry in terms of easy access to a large number of consumers, who can be directly communicated with, primarily in the digital environment, and whose attitudes and purchasing decisions can be influenced. This is supported by the results of studies that show that young people prefer to deal with their favourite brands through digital technologies. This target group does not use or very rarely uses traditional media; therefore, it is necessary to design marketing communication according to their needs and adapt it to the digital environment. Young audiences trust their eSports idols and want to emulate them. Companies who are also aware of this fact, hire eSports influencers (popular gamers) to recommend their products and services to their followers on social networks, or during gaming streaming sessions, which has turned out to be a very effective digital marketing method in recent years. Previous research has shown that with the younger population, hiring influencers by companies (athletes, gamers or other celebrities) is the most effective marketing strategy. In such cases, a positive image of the sponsoring company (and its brands) is built in the minds of young consumers. As can also be concluded from previous studies, consumers will always appreciate when brands try to reach them through the 'world of games', and there is a higher chance that they will buy such brands in the future. Sponsoring an eSports league has also been shown to have a very positive effect on the sponsor's brand and directly reinforces that brand's image.

The analysis of research question RQ1 showed that 43.15% of the respondents belonging to the audience segment and 44.4% of players agree with the statement that the promotion of brands on digital platforms intended for eSports is acceptable. 4.2% of the audience and none of the players strongly agreed. No significant difference was observed in the acceptance of the statement between the players and the audience.

The analysis of research question RQ2 showed that the statement that companies should hire credible eSports social media influencers to recommend their brands as part of their campaign is acceptable to 41.05% of respondents who belong to the audience segment and to 38.8% of players. 8.42% of the audience and 5.55% of players strongly agreed. No significant difference was observed in the acceptance of the statement between the players and the audience.

The analysis of research question RQ3 showed that the statement that companies that want to advertise their brands through digital marketing must strive to achieve

positive eWOM communication is acceptable to 28.4% of respondents who belong to the audience segment and to 50.0% of players. 4.21% of the audience and none of the players strongly agreed. No significant difference was observed in the acceptance of the statement between the players and the audience.

The research conducted in this paper confirmed all three statements with which we tested the justification of the formulated research questions, and the following conclusions were reached: Companies should focus on promoting brands on digital platforms intended for eSports, because such activities are for players and the audience generally acceptable activities of business entities; During the implementation of brand promotion on these platforms, it is desirable to engage credible eSports social media influencers to promote and recommend their brands, as well as to strive to achieve positive eWOM communication.

The results obtained by the authors can explain why digital marketing strategies are increasingly taking precedence over traditional strategies. However, strategies must be creative and precisely designed, because only then will they have the power to enable companies to differentiate themselves from the competition in today's turbulent market conditions, and be perceived by consumers in the desired way. The near future will most likely bring great innovations in the eSports industry. Virtual reality will cause a revolution in gaming and eSports, but the target group will also shift towards those gamers who are oriented towards more demanding physical activities, because VR games require serious physical efforts and skills. It remains to be seen how digital marketing will adapt to these new conditions in the eSports industry.

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Viability of Using Digital Games for Improving Team Cohesion: A Systematic Review of the Literature

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ABSTRACT:

Team cohesion, teamwork and team building are important constructs regarding teams and their performance in various organizations and environments. In this review, we summarize the current state of research on the influence of digital games on team cohesion and related constructs. We found a total of 7 studies that fit the criteria, resulting in 18 outcomes. Among the 18 outcomes that improved throughout the intervention, 15 reported significant improvement from the intervention and 3 reported no significant differences. Specifically, team communication, task delegation, atmosphere, trust, team flow, team performance and goal commitment were the most improved sub-constructs by team building video gaming interventions. The majority (n = 9) of those with significant improvements post-test were from randomly controlled trials (RCTs) with single or two control groups. Overall, we found that team video gaming may be effective in supporting team cohesion or team building; however, to enhance the understanding of the relationship between digital games and team cooperation, it is recommended to extend or vary gameplay intervention times, prioritize diverse outcome measures, address reporting biases, conduct follow-up assessments, include diverse populations and report demographics, and recognize the specific effects of different game features on outcomes.

KEY WORDS:

digital games, review, team building, team cohesion, team performance, teamwork.

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Introduction

A well-developed effective team is an asset to any business enterprise¹ and can be defined as a group of individuals who come together to work collaboratively towards a common goal or objective.² Moreover, the team is characterized by interdependence, shared responsibility and role specification.³ One of the basic parameters of a well-functioning team is team cohesion. Cohesion, in general, mirrors a particular system of attraction or bond – driven by either the team members or the team tasks and encourages the team to persevere together.⁴ Team cohesion is an essential element for teams, since the lack of a sense of cohesion within a team can result in unmotivated behaviour and a lack of participation by its members.⁵ There have been several meta-analyses of team

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- 1 HIRIYAPPA, B.: *Team Building and Group Dynamics Management*. Bloomington, IN : Booktango, 2013, p. 8.
 - 2 For more information, see: DYER Jr., W. G., DYER, J. H., DYER, W. G.: *Team Building Proven Strategies for Improving Team Performance*. San Francisco, CA : John Wiley and Sons, 2013.
 - 3 See: ZHANG, X., KWAN, H. K.: Team behavioral integration links team interdependence with team performance: an empirical investigation in R&D teams. In *Frontiers of Business Research*, Vol. 13, No. 7, p. 193-211.
 - 4 See also: CASEY-CAMPBELL, M., MARTENS, M. L.: Sticking it all together: A critical assessment of the group cohesion-performance literature. In *International Journal of Management Reviews*, 2019, Vol. 11, No. 2, p. 223-246.
 - 5 For example, see: MYSIRLAKI, S., PARASKEVA, F.: Virtual Team Effectiveness: Insights from the Virtual World Teams of Massively Multiplayer Online Games. In *Journal of Leadership Studies*, 2019, Vol. 13, No. 1, p. 34-55.

cohesion⁶ suggesting team cohesion is positively related to team effectiveness, and that the relationship is strengthened by task interdependence, such as the relationship between cohesion and effectiveness is stronger when team members are more interdependent.⁷ Team cohesion has a positive relationship with team performance.⁸ For instance, previous studies have shown that group cohesion can improve athletes' sports performance,⁹ in project teams¹⁰ or among students.¹¹

One way to increase team cohesion is to organize team-building activities. Team building refers to a systematic and intentional process aimed at enhancing the effectiveness and cohesiveness of a team.¹² Team building involves a wide range of activities, designed for improving team performance.¹³ Current research is inclined to the idea that team building does improve team outcomes. Specifically, process and affective outcomes were most improved by team-building interventions. Moreover, all the components (i.e., role clarification, goal setting, interpersonal relations, and problem solving) of team building had a moderate effect on outcomes but the goal-setting and role-clarification components had the largest effect.¹⁴ Traditional team-building activities are often conducted in physical settings. In today's rapidly evolving work landscape, where remote teams have become increasingly prevalent, it may be challenging to implement traditional team-building activities. However, the rise of digital games with competitive or cooperative elements offers a promising alternative for fulfilling the role of classic team-building activities. As the number of global users of digital games is rising (with an estimated 3.1 billion users in 2027), there is a chance that employees will use them as a team development activity and also that they will be digitally skilled to operate them.¹⁵ Due to their capabilities around easy communication, emotional engagement, and social interaction, 3D virtual worlds and team video gaming (TVG) offer a potential avenue for fostering (virtual) team development.¹⁶ Also, according to a survey conducted in Slovakia, respondents perceive

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- 6 BEAL, D. J. et al.: Cohesion and performance in groups: a meta-analytic clarification of construct relations. In *Journal of applied psychology*, 2003, Vol. 88, No. 6, p. 989.; For more information, see: CARRON, A. V. et al.: Cohesion and Performance in Sport: A Meta Analysis. In *Journal of Sport and Exercise Psychology*, 2002, Vol. 24, No. 2, p. 168-188.; EVANS, C. R., DION, K. L.: Group cohesion and performance: A meta-analysis. In *Small Group Research*, 1989, Vol. 22, No. 3, p. 175-186.; GULLY, S. M., DEVINE, D. J., WHITNEY, D. J.: A Meta-Analysis of Cohesion and Performance: Effects of Level of Analysis and Task Interdependence. In *Small Group Research*, 1995, Vol. 26, No. 2, p. 497-520.
 - 7 COOKE, N. J., HILTON, M. L.: *Enhancing the effectiveness of team science*. Washington, D.C. : National Academies Press, 2015, p. 56.
 - 8 See: GROSSMAN, R. et al.: The team cohesion-performance relationship: A meta-analysis exploring measurement approaches and the changing team landscape. In *Organizational Psychology Review*, 2022, Vol. 12, No. 2, p. 181-238.
 - 9 See: GU, S., XUE, L.: Relationships among Sports Group Cohesion, Psychological Collectivism, Mental Toughness and Athlete Engagement in Chinese Team Sports Athletes. In *International Journal of Environmental Research and Public Health*, 2022, Vol. 19, No. 9, p. 1-14. [online]. [2023-02-15]. Available at: <<https://doi.org/10.3390/ijerph19094987>>.
 - 10 For example, see: CHIOCCHIO, F., ESSIEMBRE, H.: Cohesion and Performance: A Meta-Analytic Review of Disparities Between Project Teams, Production Teams, and Service Teams. In *Small Group Research*, 2009, Vol. 40, No. 4, p. 382-420.
 - 11 For more information, see: LENT, R. W., SCHMIDT, J., SCHMIDT, L.: Collective efficacy beliefs in student work teams: Relation to self-efficacy, cohesion, and performance. In *Journal of Vocational Behavior*, 2006, Vol. 68, No. 3, p. 73-84.
 - 12 See also: BELBIN, R. M.: *Management Teams: Why they succeed or fail*. London, New York, NY : Routledge, 2010.
 - 13 See: FAPOHUNDA, T. M.: Towards Effective Team Building in the Workplace. In *International Journal of Education and Research*, 2013, Vol. 1. No. 4, p. 1-12. [online]. [2023-02-15]. Available at: <<https://www.ijern.com/images/April-2013/23.pdf>>.
 - 14 For example, see: KLEIN, C. et al.: Does Team Building Work?. In *Small Group Research*, 2009, Vol. 40, No. 2, p. 181-222.
 - 15 CLEMENT, J.: *Number of users of video games Worldwide 2017-2027*. Released on 1st June 2023. [online]. [2023-02-22]. Available at: <<https://www.statista.com/statistics/748044/number-video-gamers-world/>>.
 - 16 ELLIS, J. B. et al.: Games for Virtual Team Building. In MARSDEN, G., LADEIRA, I., KOTZÉ, P. (eds.): *DIS '08: Proceedings of the 7th ACM conference on Designing interactive systems*. New York, NY : ACM, 2008, p. 295.

these gaming and gamification aspects to be important for the future to a greater extent than they have actually applied them in the present.¹⁷

Thanks to continuous research in this area, the image of digital gaming as a negative phenomenon and a pointless activity is also gradually changing and its positive aspects are coming to the forefront of public opinion.¹⁸ Authors like J. McGonigal promote their research communicating gamers as expert problem solvers and collaborators, since they cooperate with other players to overcome daunting virtual challenges.¹⁹ Also, players' in-game motivational experiences can contribute to affective well-being, but they do not affect the degree to which play time relates to well-being.²⁰ Many features have been shown to have a positive impact on the development of various skills not only in children, but also in adults.²¹ Moreover, compared to conventional learning, game-based learning has several benefits that make it effective such as control over gaming experience, a sense of immersion and involvement, practicing knowledge and skills repeatedly, collaboration and knowledge-sharing among players and quantifiable achievements.²² Naming particular skills, game-based learning is not only about increasing motivation to learn,²³ improving cognitive abilities²⁴ and gaining hard skills, but also a wide range of soft (including social) skills. The positive impact of digital games on social behaviour has been proven and players seem to acquire important prosocial skills when they play games that are specifically designed to reward effective cooperation, support, and helpful behaviour.²⁵ Another research suggests that researchers and practitioners should consider using prosocial digital games to promote a variety of prosocial behaviours and skills that are crucial for young people's social-emotional development and the well-being of society.²⁶ Studies have also associated altruistic personality and helpful behaviours in cooperative or competitive video game play.²⁷

It goes without saying, therefore, that this potential of digital games has already been used to promote team cohesion and various teamwork skills as well, for instance team efficiency, leadership, etc.²⁸ G. S. Anderson and S. Hilton demonstrated in their study that engagement in collaborative video games has the potential to enhance team cohesion.²⁹ Also, the promotion of cohesion through cooperative team-play activates trust norms,

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- 17 STACHO, Z. et al.: Gamefikácia v procese adaptácie zamestnancov. In *REFLEXIE – Kompendium teórie a praxe podnikania*, 2022, Vol. 6, No. 2, p. 84.
 - 18 For more information, see: GRANIC, I., LOBEL, A., ENGELS, R. C. M. E.: The Benefits of Playing Video Games. In *American Psychologist*, 2014, Vol. 69, No. 1, p. 66-78.
 - 19 For example, see: MCGONIGAL, J.: *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*. New York, NY : Penguin Books, 2011.
 - 20 See also: JOHANNES, N., VUORRE, M., PRZYBYLSKI, A. K.: Video game play is positively correlated with well-being. In *Royal Society Open Science*, 2021, Vol. 8, No. 2, p. 1-14. [online]. [2023-02-15]. Available at: <<https://doi.org/10.1098/rsos.202049>>.
 - 21 For more information, see: CONNOLLY, T. M. et al.: A systematic literature review of empirical evidence on computer games and serious games. In *Computers & Education*, 2012, Vol. 59, No. 2, p. 661-686.
 - 22 See: BOWMAN Jr., R. F.: A "Pac-Man" Theory of Motivation: Tactical Implications for Classroom Instruction. In *Educational Technology*, 1982, Vol. 22, No. 9, p. 14-17.
 - 23 WICHADDEE, S., PATTANAPICHET, F.: Enhancement of Performance and Motivation through Application of Digital Games in an English Language Class. In *Teaching English with Technology*, 2018, Vol. 18, No. 1, p. 87-88.
 - 24 VICKERS, S. W.: *Digital gaming as a learning tool : a literature review*. [Master Thesis]. Cedar Falls, IA : University of Northern Iowa, 2012, p. 30.
 - 25 See also: GRANIC, I., LOBEL, A., ENGELS, R. C. M. E.: The Benefits of Playing Video Games. In *American Psychologist*, 2014, Vol. 69, No. 1, p. 66-78.
 - 26 SALEME, P. et al.: Prosocial digital games for youth: A systematic review of interventions. In *Computers in Human Behavior Reports*, 2020, Vol. 2, No. 1, p. 4-6. [online]. [2023-02-15]. Available at: <<https://doi.org/10.1016/j.chbr.2020.100039>>.
 - 27 VELEZ, J. A., EWOLDSSEN, D. R.: Helping Behaviors During Video Game Play. In *Journal of Media Psychology Theories Methods and Applications*, 2013, Vol. 25, No. 4, p. 198.
 - 28 RIIVARI, E., KIVIJÄRVI, M., LÄMSÄ, A.-M.: Learning teamwork through a computer game: for the sake of performance or collaborative learning?. In *Educational Technology Research and Development*, 2021, Vol. 69, No. 3, p. 1765.
 - 29 ANDERSON, G. S., HILTON, S.: Increase team cohesion by playing cooperative video games. In *Software Education Today*, 2015, Vol. 28, No. 1, p. 36.

resulting in an increase in cooperative behaviour.³⁰ The issue of the involvement of digital games in the development of team spirit, with an emphasis on improving team cohesion, is evolving gradually with the rise of esports, which are very closely linked to this issue. There is evidence that involvement in esports helps young players to develop skills that are needed in 21st century societies and which are increasingly valued by employers.³¹ Mostly, competitive or cooperative digital games which are the foundation of electronic sports are a way to improve team functions through play. In gameplay scenarios involving teams competing against each other or solving specific challenges, the inclusion of agents as mechanisms to influence team behaviour becomes a significant factor. Additionally, game environments are particularly suitable for situations where manipulation of resource constraints, such as decision-making time, is desirable.³² Also, esports players have experience which leads to significant benefits for communicative competencies.³³

Due to the positive effects of esports and competitive play on behaviour in the context of increasing commitment and the formation of cohesive teams therefore, positive effects can also be assumed in the organizational environment. In addition, esports, and digital competitive gaming in general, develop necessary soft-skills, for example, problem-solving, schematic and conceptual thinking, working under pressure and leadership.³⁴ For this reason, we decided to design a research project called Using Competitive Digital Games to Develop Team Cohesion and Social Adaptation in Generation Z. Its aim is to develop a methodology for the effective use of competitive digital games. As part of the sub-objectives of this project, we are creating a competitive digital game that will be used for research purposes, in particular, conducting an experimental play of a competitive game, based on which we will investigate the degree of increase in team cohesion in the research sample. For this reason, we have decided to conduct this pre-research in the form of a literature review. The main aim of this study is to provide an overview and to summarize current data on the issue, what experiments on team video gaming have been carried out so far and what results they have produced in relation to team cohesion. We therefore formulated our research question as follows: What has been found so far in the literature about the impact of digital games on team cohesion and team building?

Methods

The literature review is conducted in relation to the research project mentioned above and in accordance with the principles of systematic reviews as described by J. Hendl and J. Mareš.³⁵ We have followed the PRISMA guidelines to ensure transparent

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- 30 GREITEMEYER, T., COX, C.: There's no "I" in team: Effects of cooperative video games on cooperative behavior. In *European Journal of Social Psychology*, 2013, Vol. 43, No. 3, p. 227.
 - 31 ZHONG, Y. et al.: The impact of esports participation on the development of 21st century skills in youth: A systematic review. In *Computers & Education*, 2022, Vol. 191, No. 8, p. 11. [online]. [2023-03-01]. Available at: <<https://doi.org/10.1016/j.compedu.2022.104640>>.
 - 32 DI PIETRANTONIO, J., MENDONCA, D.: Opening the Black Box of Team Performance with Open-source Games: A Review and Recommendations. In *IEEE Transactions on Games*, 2022, Vol. 14, No. 2, p. 175-177.
 - 33 HANGHØJ, T., NIELSEN, R. K. L.: Esports skills are people skills. In ELEAEK, L. et al. (eds): *13th European Conference on Games Based Learning (ECGBL 2019)*. Reading : Academic Conferences and Publishing International Limited, 2019, p. 541.
 - 34 See: HEWETT, K. J. E.: Embracing Video Games for Strategic Thinking, Collaboration, and Communication Skills Practice. In KHOSROW-POUR, M. (ed.): *Research Anthology on Fandoms, Online Social Communities, and Pop Culture*. Hershey, PA : IGI Global, 2022, p. 296-314.
 - 35 HENDL, J.: *Kvalitativní výzkum: Základní metody a aplikace*. Prague : Portál, 2005, p. 349-369.; MAREŠ, J.: Přehledové studie: jejich typologie, funkce a způsob vytváření. In *Pedagogická orientace*, 2013, Vol. 23, No. 4, p. 429-434.

and comprehensive reporting of our review process.³⁶ For inclusion in the review, papers were required to (a) evaluate the effects of a digital game on team cohesion, teamwork or team building; (b) include measurable, quantitative outcomes in the design and purpose of the study; (c) be published in or translated into English; (d) be peer-reviewed; (e) date from January 2010 to November 2022; and (f) have a nonclinical study population over the age of 18. As we were interested in teams forming and functioning in professional or higher education environments, we excluded studies focused on children or adolescents. Non-peer-reviewed reports, such as unpublished manuscripts or conference abstracts, were not eligible for inclusion.

The electronic databases searched for this review were Scopus and Web of Science. The search was conducted in November 2022. Search terms included (“team cohesion” OR “teamwork” OR “team building”) AND (“video game” OR “digital game”). Applying the snowballing method, reference lists cited in study reports included in the review were also searched. Titles and abstracts were reviewed for eligibility and relevant articles were obtained in full and assessed against the inclusion criteria described above.

Each record’s title and abstract were screened by one researcher, each retrieved report was then screened independently by two researchers, and any disagreements were resolved by discussion. Two reviewers working independently collected data from each report identified as eligible at the full text level. Discrepancies in the full-study coding were resolved by discussion.

Study factors were coded based on coding from past reviews of game-based social skill development³⁷. Reports were coded in terms of: name of authors and date published; the main aims of study; the team outcomes; study design, follow-up, and duration; details of participants, their mean age, age range, education level, gender split, ethnicity breakdown; presence of facilitator; game creator involvement.

Results

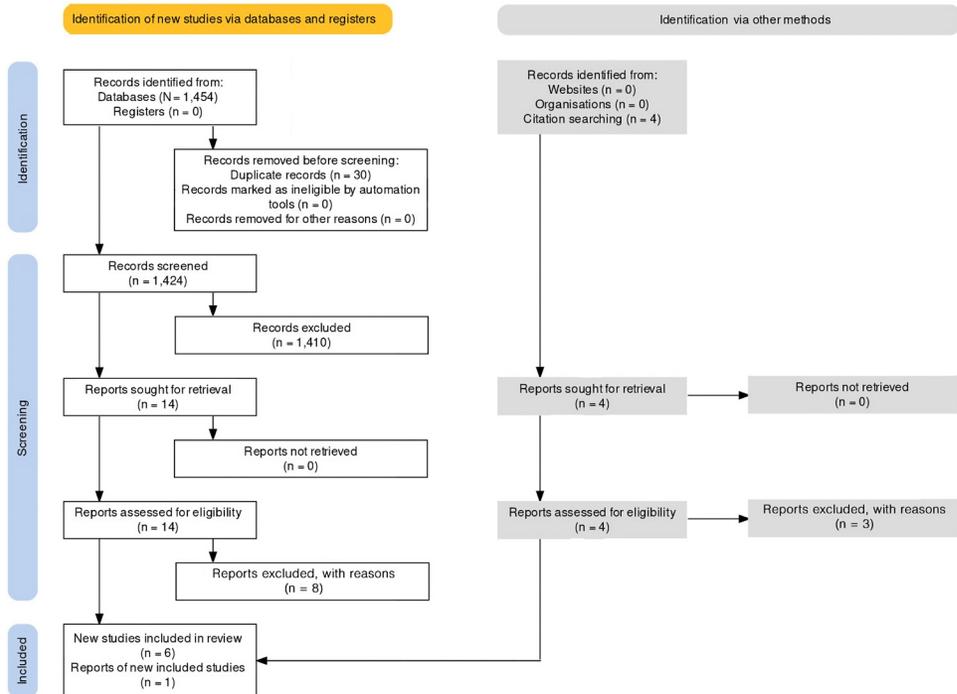
The number of records at all stages of the review is reported using the PRISMA flow diagram (Picture 1). Among the reports assessed for eligibility, eleven were excluded from the final review for the following reasons: the games selected to study their effects on team cohesiveness, teamwork engagement/competence and/or team building were not digital games;³⁸ studies reported early versions of an ongoing research or used identical

36 PAGE, M. J. et al.: The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. In *International Journal of Surgery*, 2021, Vol. 372, No. 71, p. 6. [online]. [2023-01-17]. Available at: <<https://doi.org/10.1016/j.ijssu.2021.105906>>.

37 JANUARY, A. M., CASEY, R. J., PAULSON, D.: A Meta-Analysis of Classroom-Wide Interventions to Build Social Skills: Do They Work?. In *School Psychology Review*, 2011, Vol. 40, No. 2, p. 246-247.; CONNOLLY, T. M. et al.: A systematic literature review of empirical evidence on computer games and serious games. In *Computers & Education*, 2012, Vol. 59, No. 2, p. 663-664.; ABDUL JABBAR, A. I., FELICIA, P.: Gameplay Engagement and Learning in Game-Based Learning: A Systematic Review. In *Review of Educational Research*, 2015, Vol. 85, No. 4, p. 748-749.; CLARK, D. B., TANNER-SMITH, E. E., KILLINGSWORTH, S. S.: Digital Games, Design, and Learning: A Systematic Review and Meta-Analysis. In *Review of Educational Research*, 2016, Vol. 86, No. 1, p. 89-90.; QIAN, M., CLARK, K. R.: Game-based Learning and 21st century skills: A review of recent research. In *Computers in Human Behavior*, 2016, Vol. 63, No. 1, p. 52-53.; ZHENG, L. R. et al.: Serious Games as a Complementary Tool for Social Skill Development in Young People: A Systematic Review of the Literature. In *Simulation & Gaming*, 2021, Vol. 52, No. 6, p. 690-692.

38 See: BOZANTA, A. et al.: Effects of serious games on perceived team cohesiveness in a multi-user virtual environment. In *Computers in Human Behaviour*, 2011, Vol. 59, No. 1, p. 380-388.; MARTÍN-HERNÁNDEZ, P. et al.: Fostering University Students’ Engagement in Teamwork and Innovation Behaviors through Game-Based Learning (GBL). In *Sustainability*, 2021, Vol. 13, No. 24, p. 1-16. [online]. [2023-02-02]. Available at: <<https://doi.org/10.3390/su132413573>>.

experiments to other studies included in the final review;³⁹ studies researched the influence of team cohesion on in-game team performance, not the effects of playing games on team cohesion;⁴⁰ studies reported pilot studies, trial runs or preliminary research and/or did not include quantifiable outcomes.⁴¹



Picture 1: PRISMA flow diagram of the study selection process

Source: own processing; HADDAWAY, N. R. et al.: PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis. In *Campbell Systematic Reviews*, 2022, Vol. 18, No. 2, p. 5. [online]. [2023-05-12]. Available at: <<https://doi.org/10.1002/cl2.1230>>.

- 39 See also: ANDERSON, G.: *The Impact of Cooperative Video Games on Team Cohesion*. [Dissertation Thesis]. Terre Haute, IN : Indiana State University, 2010.; GREITEMEYER, T., TRAUT-MATTAUSCH, E., OSSWALD, S.: How to ameliorate negative effects of violent video games on cooperation: Play it cooperatively in a team. In *Computers in Human Behaviour*, 2012, Vol. 28, No. 4, p. 1465-1470.; KEITH, M. J. et al.: Team Video Gaming for Team Building: Effects on Team Performance. In *AIS Transactions on Human-Computer Interaction*, 2018, Vol. 10, No. 4, p. 205-231.
- 40 For more information, see: MAYER, I. et al.: Stealth Assessment of Teams in a Digital Game Environment. In DE GLORIA, A. (ed.): *Games and Learning Alliance: Second International Conference, GALA 2013*. Cham : Springer, 2014, p. 224-235.; MAYER, I.: Assessment of Teams in a Digital Game Environment. In *Simulation & Gaming*, 2018, Vol. 49, No. 6, p. 602-619.
- 41 For example, see: WATTS, C., SHARLIN, E., WOYTIUK, P.: Exploring Interpersonal Touch-Based Interaction and Player Socialization in Prism Squad: GO!. In PRAKASH, E. C. (ed.): *Proceedings of the 3rd annual International Conference [on] Computer Games, Multimedia & Allied Technology (CGAT 2010)*. Singapore : APTF, 2010, p. 1-8. [online]. [2023-06-02]. Available at: <<https://utouch.cpsc.ucalgary.ca/docs/PrismSquadGO-CGAT2010-CW.pdf>>; VON THIENEN, J. et al.: Leveraging Video Games to Improve IT-Solutions for Remote Work. In PREUSS, M. (ed.): *2021 IEEE Conference on Games (CoG)*. Piscataway, NJ : IEEE, 2021, p. 1-8. [online]. [2023-03-12]. Available at: <https://www.researchgate.net/publication/353482804_Leveraging_Video_Games_to_Improve_IT-Solutions_for_Remote_Work>; NELSON, M., AHN, B.: Use of games to teach teamwork and communication skills to engineering students. In *2021 IEEE Frontiers in Education Conference (FIE)*. Piscataway, NJ : IEEE, 2021, p. 1-9. [online]. [2023-03-16]. Available at: <<https://doi.org/10.1109/FIE49875.2021.9637377>>; PRATTICÓ, F. G. et al.: Asteroid Escape: A Serious Game to Foster Teamwork Abilities. In CIGNONI, P., MIGUEL, E. (eds.): *40th Annual Conference of the European Association for Computer Graphics, Eurographics 2019 – Short Papers*. Eindhoven : The Eurographics Association, 2019, p. 53-56.

We found a total of 7 studies that fit the criteria, resulting in 18 outcomes. Study characteristics are included in Table 1. The studies resulted in the following outcomes related to team cohesion, teamwork or team building: team cohesion,⁴² social relationships, i.e. cohesion, communication, task delegation (giving and taking), atmosphere,⁴³ cooperative behaviour,⁴⁴ trust,⁴⁵ team flow,⁴⁶ goal commitment,⁴⁷ team performance,⁴⁸ teamwork skills.⁴⁹

Table 1: Characteristics of studies included in literature review (n = 7)⁵⁰

Type of study		N	Total
Randomly controlled trials	Waitlist control	0	4
	Single control	3	
	Two control	1	
Quasi-experimental	Single control	1	4
	No control	3	

- 42 See: ANDERSON, G. S., HILTON, S.: Increase team cohesion by playing cooperative video games. In *CrossTalk*, 2015, Vol. 28, No. 1, p. 33-37.; GREITEMEYER, T., COX, C.: There's no "I" in team: Effects of cooperative video games on cooperative behavior. In *European Journal of Social Psychology*, 2013, Vol. 43, No. 3, p. 224-228.; KEITH, M. J. et al.: The Effects of Video Gaming on Work Group Performance. In ÅGERFALK, P. J., LEVINA, N., KIEN, S. S. (eds.): *Proceedings of the International Conference on Information Systems – Digital Innovation at the Crossroads, ICIS 2016*. Atlanta, GA: Association for Information Systems, 2016, p. 1-20. [online]. [2023-06-02]. Available at: <<https://aisel.aisnet.org/icis2016/HumanBehavior/Presentations/21/>>; KEITH, M. J. et al.: Team Building Through Team Video Games: Randomized Controlled Trial. In *JMIR Serious Games*, 2021, Vol. 9, No. 4, p. 1-16. [online]. [2023-02-02]. Available at: <<https://doi.org/10.2196/28896>>.
- 43 For example, see: GARCIA, M. B. et al.: Promoting Social Relationships Using a Couch Cooperative Video Game: An Empirical Experiment with Unacquainted Players. In *International Journal of Gaming and Computer-Mediated Simulations*, 2022, Vol. 14, No. 1, p. 1-18. [online]. [2023-06-03]. Available at: <<https://doi.org/10.4018/IJGCMS.303106>>.
- 44 See also: GREITEMEYER, T., COX, C.: There's no "I" in team: Effects of cooperative video games on cooperative behaviour. In *European Journal of Social Psychology*, 2013, Vol. 43, No. 3, p. 224-228.; WENDEL, V. et al.: Designing A Collaborative Serious Game For Team Building Using Minecraft. In VAZ DE CARVALHO, C., ESCUDEIRO, P. (eds.): *Proceedings of the 7th European Conference on Games Based Learning*. Reading: Academic Conferences Limited, 2013, p. 569-578.
- 45 Ibidem.
- 46 See: KEITH, M. J. et al.: The Effects of Video Gaming on Work Group Performance. In ÅGERFALK, P. J., LEVINA, N., KIEN, S. S. (eds.): *Proceedings of the International Conference on Information Systems – Digital Innovation at the Crossroads, ICIS 2016*. Atlanta, GA: Association for Information Systems, 2016, p. 1-20. [online]. [2023-06-02]. Available at: <<https://aisel.aisnet.org/icis2016/HumanBehavior/Presentations/21/>>; KEITH, M. J. et al.: Team Building Through Team Video Games: Randomized Controlled Trial. In *JMIR Serious Games*, 2021, Vol. 9, No. 4, p. 1-16. [online]. [2023-02-02]. Available at: <<https://doi.org/10.2196/28896>>.
- 47 For example, see: KEITH, M. J. et al.: The Effects of Video Gaming on Work Group Performance. In ÅGERFALK, P. J., LEVINA, N., KIEN, S. S. (eds.): *Proceedings of the International Conference on Information Systems – Digital Innovation at the Crossroads, ICIS 2016*. Atlanta, GA: Association for Information Systems, 2016, p. 1-20. [online]. [2023-06-02]. Available at: <<https://aisel.aisnet.org/icis2016/HumanBehavior/Presentations/21/>>.
- 48 See: KEITH, M. J. et al.: The Effects of Video Gaming on Work Group Performance. In ÅGERFALK, P. J., LEVINA, N., KIEN, S. S. (eds.): *Proceedings of the International Conference on Information Systems – Digital Innovation at the Crossroads, ICIS 2016*. Atlanta, GA: Association for Information Systems, 2016, p. 1-20. [online]. [2023-06-02]. Available at: <<https://aisel.aisnet.org/icis2016/HumanBehavior/Presentations/21/>>; KEITH, M. J. et al.: Team Building Through Team Video Games: Randomized Controlled Trial. In *JMIR Serious Games*, 2021, Vol. 9, No. 4, p. 1-16. [online]. [2023-02-02]. Available at: <<https://doi.org/10.2196/28896>>.
- 49 For more information, see: WANG, D.-Y., CHEN, Y.-A.: Training Teamwork Skills Using MMORPGs. In *2012 IEEE Fourth International Conference on Digital Game and Intelligent Toy Enhanced Learning*. Piscataway, NJ: IEEE, 2012, p. 94-98.
- 50 Remark by the authors: The studies encompassed various measures and assessments, resulting in a total that does not add up to 7. Types of study also exceed 7, because one study reported two experiments with different control group conditions. In *Mention sample demographics, no breakdown* offers general statement about demographics, *breakdown* specifies the percentage of racial or ethnic groups.

Measure format	<i>Survey</i>	7	11
	<i>Task Assessment</i>	4	
Reporter (survey)	<i>Self-report</i>	7	7
Facilitator present	<i>Reported</i>	1	7
	<i>Not reported</i>	6	
Creator as author		2	2
Follow-up conducted		0	0
Participant age	<i>18-29</i>	5	7
	<i>Mixed</i>	1	
	<i>Not reported</i>	1	
Education	<i>College/university students or higher</i>	5	7
	<i>Not reported</i>	2	
Continent	<i>North America</i>	3	7
	<i>Europe</i>	2	
	<i>Asia</i>	2	
Gender	<i>0-45% female</i>	4	7
	<i>45-55% female</i>	0	
	<i>55-100% female</i>	1	
	<i>Not reported</i>	2	
Mention sample demographics	<i>Yes, no breakdown</i>	0	7
	<i>Yes, breakdown</i>	1	
	<i>No</i>	6	

Source: own processing

Most of the studies (n = 5) used previously designed games: *Halo 3*⁵¹, *Mario Kart: Double Dash!!*⁵², *Halo 4*⁵³, *Rock Band*⁵⁴, *World of Warcraft*⁵⁵, *Minecraft*⁵⁶. One study used a game designed specifically for the purposes of the study (*Quick Fix*⁵⁷) and one used a specifically designed modification of the pre-existing popular game *Minecraft*⁵⁸ (Table 2). All studies used surveys and four of them added task assessment as another measure of outcome. None of the studies included follow-up and they were conducted in the United States (n = 3), Europe (n = 2) or Asia (n = 2). Study duration was mostly not reported (n = 5). The duration of gameplay in those studies that reported it (n = 4) was between 15 and 45 minutes.

51 BUNGIE: *Halo 3*. [digital game]. Redmond, WA : Microsoft Game Studios, 2007.

52 NINTENDO EAD: *Mario Kart: Double Dash!!*. [digital game]. Kyoto : Nintendo, 2003.

53 343 INDUSTRIES: *Halo 4*. [digital game]. Redmond, WA : Microsoft Studios, 2012.

54 HARMONIX, PI STUDIOS: *Rock Band*. [digital game]. New York, NY : MTV Games, 2007.

55 BLIZZARD ENTERTAINMENT: *World of Warcraft*. [digital game]. Irvine, CA : Blizzard Entertainment, 2004.

56 MOJANG STUDIOS: *Minecraft*. [digital game]. Stockholm : Mojang Studios, 2011.; Remark by the authors: There was used a special game mod for the experiment.

57 Remark by the authors: The game is not available publicly.; See also: GARCIA, M. B. et al.: Promoting Social Relationships Using a Couch Cooperative Video Game: An Empirical Experiment with Unacquainted Players. In *International Journal of Gaming and Computer-Mediated Simulations*, 2022, Vol. 14, No. 1, p. 1-18. [online]. [2023-06-03]. Available at: <<https://doi.org/10.4018/IJGCMS.303106>>.

58 See: WENDEL, V. et al.: Designing A Collaborative Serious Game For Team Building Using *Minecraft*. In VAZ DE CARVALHO, C., ESCUDEIRO, P. (eds.): *Proceedings of the 7th European Conference on Games Based Learning*. Reading : Academic Conferences Limited, 2013, p. 569-578.

Table 2: Description of digital games used in interventions

Title	Description
<i>Halo 3</i>	<i>A commercially available action game and a first-person shooter. One to four players participate on one of four teams thus creating a cooperative environment where team members must defend and protect each other against the enemy. If desired, four teams of four players can participate at one time playing against the other teams</i>
<i>Mario Kart: Double Dash!!</i>	<i>A commercially available racing game. In the cooperative mode, one player controls the kart while the other controls the use of items used to slow down the other competitors or gain an advantage over them. The two players may switch roles at any time by simultaneously pressing a button on their respective controllers. In the single mode, the player controls both the kart and the items.</i>
<i>Halo 4</i>	<i>A commercially available action game and a first-person shooter. In multiplayer mode, the players must coordinate their attacks in order to beat the other group.</i>
<i>Rock Band</i>	<i>A commercially available music game. The players must coordinate their activities to perform the songs correctly.</i>
<i>World of Warcraft</i>	<i>A leader among the current generation of MMORPGs (commercially available). The players are allowed to choose the race and class (profession) of the role they want to play. Every race and every character class has different abilities, and players will be faced with a variety of tasks and situations in the game. In order to achieve high scores, they need to adopt heterogeneous grouping in the game.</i>
<i>Quick Fix</i>	<i>A couch cooperative video game, developed for this study (not commercially available). The game mechanics emulate the model of an auto repair simulator, where players perform repairs and other services on vehicles. In line with the goal, the in-game tasks imitate a sequential team-building design, playable by 2-4 players. Players have the freedom to distribute task assignments. The formulation of teamwork is dependent on how players intercommunicate with one another during gameplay.</i>
<i>Minecraft</i>	<i>A commercially available sandbox game. The players' task is to save the 'last gnome on earth'. Only one player at a time can carry the gnome. This player will continuously slow down until he/she cannot move at all. Furthermore, this player cannot jump. This mechanic forces players to hand the gnome to each other in order to be able to move the gnome forward and to overcome certain obstacles.</i>

Source: own processing

Outcomes that improved throughout the intervention included team cohesion, social relationships, trust, cooperative behaviour, team flow and performance and goal commitment. Team cohesion was the outcome most commonly measured across studies, with five studies including it as an outcome measure. Post-test, out of the 18 outcomes, 15 reported significant improvement from the intervention and 3 reported no significant differences from the intervention. Of those with significant improvements post-test (n = 15), most (n = 9) were from randomly controlled trials (RCTs) with single or two control groups. Details of all studies, measures, and team cohesion improvements are summarized in Table 3.

Discussion

In this review, we summarize the current existing literature on digital games' influence on team cohesion and related constructs (teamwork and team building). We found significant team improvements in studies that targeted team cohesion, team communication, task delegation, atmosphere, trust, team flow, goal commitment and team performance. However, overall few studies have been conducted and peer-reviewed in the literature on the subject. Those few that have been, use considerably different methods and outcome measures that are not easily unifiable. There are also certain contradictory results. In V. Wendel et al., the outcome 'cooperative behaviour' is measured by using self-report surveys and task assessments. While the survey reports improved cooperation after TVG treatment, the assessment of the prisoner's dilemma game shows no significant effect ($p > .20$).⁵⁹ Using a similar measure of two-person give-some dilemma, T. Greitemeyer and C. Cox reported a significant improvement in cooperative behaviour, including the effect size (very large, $d = 1.12$).⁶⁰ The lack of effect in the results of V. Wendel et al. can be explained by familiarity between participants, who knew each other and cooperated before the study, so the 25 minute-long treatment could not make a meaningful impact in this area.⁶¹ D.-Y. Wang and Y.-A. Chen failed to show significant improvement in teamwork skills using World of Warcraft in their quasi-experimental design (no control group). As if to compensate, authors resort to anecdotal evidence: "For instance, one team had a poor atmosphere in the beginning. [...] Afterwards, the team's atmosphere was changed." Based on this and contrary to their own experimental results, they "still believe that games are effective in training teamwork skills." Such a conclusion is obviously uncalled-for.⁶²

The group of researchers around M. J. Keith is represented in our results by two studies. M. J. Keith and his colleagues are consistently interested in the social effects of digital games.⁶³ G. S. Anderson, co-author of another reviewed study from 2015, is also a co-author of both M. J. Keith-led studies. In a sense, this is a review of evolution in their common research, of refinement in their theoretical backgrounds, experimental methods, outcome measures and overall quality of reporting. For example, G. S. Anderson's study from 2015 has quasi-experimental design and does not report effect sizes,⁶⁴ both M. J. Keith-led studies are RCT designs, report effect sizes and the study from 2021 is the only one in this review to analyze the demography of its participants. Remarkably, while both G. S. Anderson's study from 2015 and the M. J. Keith-led study from 2016 report significant improvement in self-reported team cohesion, their latest study from

59 WENDEL, V. et al.: Designing A Collaborative Serious Game For Team Building Using Minecraft. In VAZ DE CARVALHO, C., ESCUDEIRO, P. (eds.): *Proceedings of the 7th European Conference on Games Based Learning. Reading: Academic Conferences Limited*, 2013, p. 575-576..

60 GREITEMEYER, T., COX, C.: There's no "I" in team: Effects of cooperative video games on cooperative behavior. In *European Journal of Social Psychology*, 2013, Vol. 43, No. 3, p. 226.

61 For example, see: WENDEL, V. et al.: Designing A Collaborative Serious Game For Team Building Using Minecraft. In VAZ DE CARVALHO, C., ESCUDEIRO, P. (eds.): *Proceedings of the 7th European Conference on Games Based Learning. Reading: Academic Conferences Limited*, 2013, p. 569-578.

62 WANG, D.-Y., CHEN, Y.-A.: Training Teamwork Skills Using MMORPGs. In *2012 IEEE Fourth International Conference on Digital Game and Intelligent Toy Enhanced Learning*. Piscataway, NJ : IEEE, 2012, p. 96.

63 See: KEITH, M. J. et al.: The Effects of Video Gaming on Work Group Performance. In ÁGERFALK, P. J., LEVINA, N., KIEN, S. S. (eds.): *Proceedings of the International Conference on Information Systems – Digital Innovation at the Crossroads, ICIS 2016*. Atlanta, GA : Association for Information Systems, 2016, p. 1-20. [online]. [2023-06-02]. Available at: <<https://aisel.aisnet.org/icis2016/HumanBehavior/Presentations/21/>>; KEITH, M. J. et al.: Team Building Through Team Video Games: Randomized Controlled Trial. In *JMIR Serious Games*, 2021, Vol. 9, No. 4, p. 1-16. [online]. [2023-02-02]. Available at: <<https://doi.org/10.2196/28896>>.

64 See also: ANDERSON, G. S., HILTON, S.: Increase team cohesion by playing cooperative video games. In *CrossTalk*, 2015, Vol. 28, No. 1, p. 33-37.

2021, based on similar methods and the same outcome measure (Group Environment Questionnaire),⁶⁵ shows no significant results ($p = .49$).⁶⁶ This is not concerning for the authors, because they have developed a different social construct of team flow that, according to their results, is manipulated by TVG (unlike cohesion) and better accounts for heightened team performance (team building).

Our review only relied on self-report surveys in all of the studies, which could provide a limited viewpoint on the impact of the digital game and the changes it may bring. On the whole, studies avoided reporting biases. None of the studies conducted follow-up procedures. As social constructs, team cohesion or team flow may take a longer time to appear in assessment. Team building implies gradual process in its name, but only one study used more than one hour of gameplay time. Without conducting follow-ups, existing literature is unable to say anything about the possible lasting team effects of video gaming.

Only one of the studies included demographic information about its participants. If the backgrounds of participants are not taken into account, the outcomes of interventions could exhibit bias towards particular races or ethnicities.⁶⁷ Most studies ($n = 5$) took place in the United States or Europe. Partly due to the small sample and missing demographic information we could not establish any specific correlation between the outcome of the study and the location or demographics of the study. Acknowledging and addressing the study sample is an essential initial measure in comprehending the variations in how diverse demographics react to interventions.⁶⁸

According to S. L. Marlow et al. the general limitation in studying the impact of games on learning outcomes is the challenge of distinguishing the distinct effects of various game characteristics.⁶⁹ Typically (as in our review), studies employ commercial off-the-shelf (COTS) games that come with predetermined features,⁷⁰ making it difficult to modify attributes according to specific researchers' needs. Improving team cohesion or teamwork can be compared to learning outcomes, therefore this limitation is relevant to our review. On the other hand, even if one attribute can be changed, it often leads to unintentional alterations in other game features.⁷¹ The studies cannot provide the complete mechanism by which digital games enable the desired results and the specific game attributes are not linked to teamwork behaviours.⁷²

The submitted review also has certain limitations in its design. We have focused on quantitative research on the efficacy of digital games for improving team cohesion, while overlooking qualitative studies. Our data synthesis was inadequate for meta-analysis due

65 For more information, see: CARRON, A. V. et al.: Cohesion and performance in sport: A meta-analysis. In *Journal of Sport and Exercise Psychology*, 2002, Vol. 24, No. 2, p. 168-188.

66 KEITH, M. J. et al.: Team Building Through Team Video Games: Randomized Controlled Trial. In *JMIR Serious Games*, 2021, Vol. 9, No. 4, p. 9. [online]. [2023-02-02]. Available at: <<https://doi.org/10.2196/28896>>.

67 DELUCA, S. M., KELMAN, A. R., WAELDE, L. C.: A Systematic Review of Ethnoracial Representation and Cultural Adaptation of Mindfulness - and Meditation-Based Interventions. In *Psychological Studies*, 2018, Vol. 63, No. 2, p. 125.; HOFFMANN, D. M.: Reflecting on Social Emotional Learning: A Critical Perspective on Trends in the United States. In *Review of Educational Research*, 2009, Vol. 79, No. 2, p. 540-542.; MAHFOUZ, J., ANTHONY-STEVENSON, V.: Why Trouble SEL? The Need for Cultural Relevance in SEL. In *Occasional Paper Series*, 2020, Vol. 11, No. 43, p. 61-62.

68 PARRISH, P., LINDER-VANBERSCHOT, J.: Cultural dimensions of learning: Addressing the challenges of multicultural instruction. In *The International Review of Research in Open and Distributed Learning*, 2010, Vol. 11, No. 2, p. 10-16.

69 MARLOW, S. L. et al.: Eliciting teamwork with game attributes: A systematic review and research agenda. In *Computers in Human Behavior*, 2016, Vol. 55, No. 1, p. 421.

70 BOWERS, C. A., JENTSCH, F.: Use of commercial, off-the-shelf, simulations for team research. In SALAS, E. (ed.): *Advances in Human Performance and Cognitive Engineering Research, Vol. 1*. Bingley : Emerald Group Publishing, 2001, p. 296.

71 BEDWELL, W. L. et al.: Toward a Taxonomy Linking Game Attributes to Learning: An Empirical Study. In *Simulation & Gaming*, 2012, Vol. 43, No. 6, p. 734.

72 MARLOW, S. L. et al.: Eliciting teamwork with game attributes: A systematic review and research agenda. In *Computers in Human Behavior*, 2016, Vol. 55, No. 1, p. 421.

to restricted data availability, variations in interventions and constructs evaluated. The instruments employed for some of the outcomes lacked validation or explicit description. As a result, the findings derived from these possibly invalid and unreliable measures may not accurately represent the actual impacts of the intervention.

There are many ways to improve research in digital games' effects on team cohesion. Study design can be improved by extending or varying the gameplay intervention times (or at least reporting them); prioritizing other outcome measures than self-report surveys; reporting biases; conducting follow-ups; sampling from diverse populations; reporting demographics; and recognizing the distinct effects of various game features on the outcomes.

Conclusion

Our literature review highlights the current state of research on the influence of digital games on team cohesion and on related constructs such as teamwork and team building. Although several studies demonstrate significant improvements in team-related factors, there are notable limitations and inconsistencies within the existing literature.

The review revealed that only a limited number of studies have been conducted and peer-reviewed in this area, and they employ diverse methodologies and outcome measures, making it challenging to establish unified conclusions. Contradictory results were observed in certain cases, such as the disparity between self-report surveys and task assessments in measuring cooperative behaviour, or discrepancies in the results regarding self-reported team cohesion between studies using identical methods and outcome measures.

One significant limitation of the reviewed studies is their heavy reliance on self-report surveys, which may offer a limited perspective on the impact of digital games and the changes they bring. Additionally, the absence of follow-up procedures and limited gameplay time hindered the understanding of lasting team effects and the gradual process of team building. Demographic information was lacking in most studies, which raises concerns about potential biases in intervention outcomes concerning certain races or ethnicities. Moreover, the majority of studies were conducted in the United States or Europe. Limitations such as restricted data availability for meta-analysis and insufficient validation or explicit description of outcome measures underscore the need for improved study designs and methodology in future research.

Team video gaming may be effective in supporting team cohesion or team building. However, this finding is only preliminary due to the factors mentioned above. To enhance the understanding of digital games' impact on team cohesion, it is recommended to extend or vary gameplay intervention times, prioritize diverse outcome measures, address reporting biases, conduct follow-up assessments, include diverse populations and report demographics, and recognize the specific effects of different game features on outcomes. By addressing these recommendations, future research can provide more robust and comprehensive insights into the relationship between digital games and team cohesion, facilitating the development of effective interventions and strategies to enhance teamwork and collaboration in various contexts.

Table 3: Study details (n = 7)

Study / game(s)	Participants	Design	Outcome measure(s)
G. S. Anderson, S. Hilton (2015) / Halo 3	56 participants in the United States Age: 18-29 Gender: 13% Female Ethnicity: not reported	Quasi-experimental No control No follow-up Facilitator not reported	Self-report team cohesion Measure: Group Environment Questionnaire (modified from A. V. Carron et al., 2002; validated) Improved at post in all 4 submeasures (ATG-T, ATG-S, GI-T, GI-S) No significant difference in gameplay duration (1h/6h)
M. B. Garcia et al. (2022) / Quick Fix	61 participants in the Philippines Gender: Not reported Education: Not reported, Ethnicity: Not reported Age: Not reported	Quasi-experimental No control No follow-up Facilitator not reported	Self-report social relationships (cohesion, communication, task delegation, atmosphere) Measure: Evaluation of Social Systems Scale (C. Aguilar-Raab, D. Grevenstein, J. Schweitzer, 2015; validated) Improved Cohesion $p = .019$ Task delegation $p = .041$ Communication $p = .041$ Atmosphere $p = .037$
T. Greitemeyer, C. Cox (2013) / Mario Kart: Double Dash!!	56 participants in Great Britain Gender: 63% female Education: University students Ethnicity: Not reported Age: 18-29 (assumed)	RCT Single control – single-player game No follow-up Facilitator not reported	Self-report cohesion Measure: Not specified Self-report trust Measure: Not specified Improved $t(33) = 4.89, p < .001, d = 1.65$ Improved $t(33) = 2.23, p < .05, d = .68$ Improved $\beta = .47, p < .01, d = 1.12$
M. J. Keith et al. (2016) / Halo 4, Rock Band	Experiment 1: 352 participants Gender: 21% Female Experiment 2: 372 participants Gender: 28% Female United States Education: University students Ethnicity: Not reported Age: 18-29 (assumed)	RCT Experiment 1: two controls – individual homework/goal training seminar Experiment 2: single control – individual homework No follow-up Facilitator not reported	Identical outcome measures for Experiments 1 and 2 except for goal commitment (absent from Experiment 2) Self-report team flow (referred to as group flow) Measure: Cognitive absorption (modified from R. Agarwal, E. Karahanna, 2000; validated) Self-report team cohesion (referred to as group cohesion) Measure: Group Environment Questionnaire (A. V. Carron et al., 1985; validated) Self-report (group) goal commitment Measure: not specified (H. J. Klein et al. 1999) Behavioural assessment of team (group) performance Measure: developed for study Experiment 1 Improved $\beta = .30, p < .001$ Improved $\beta = .29, p < .001$ Improved $\beta = .18, p < .05$ Improved $F = 5.282, p = .007$

<p>M. J. Keith et al. (2021) / Halo 4, Rock Band</p>	<p>586 participants in the United States Gender: 24.2% Female Education: University students Age: 22.9 (mean) Ethnicity: 80.4% Caucasian, 10.1% Asian, 7% Hispanic</p>	<p>RCT Single control – no team-building activity No follow-up Facilitator present</p>	<p>Self-report team flow Measure: Cognitive absorption (modified from R. Agarwal, E. Karahanna, 2000; validated) Self-report team cohesion Measure: Group Environment Questionnaire (A. V. Carron et al., 1985; validated) Behavioural assessment of team performance Measure: developed by researchers</p>	<p>Experiment 2 (summarized): All forms of video gaming (including individual, competitive, and cooperative) are an effective strategy for building group flow and group cohesion that in turn improve performance. Improved (via construct of challenge) $\beta = .451, p < .001$ No significant effect $\beta = -.004, p = .49$ Improved $F(1,22) = 8.760, p = .004$ No significant effect</p>
<p>D.-Y. Wang, Y.-A. Chen (2012) / World of Warcraft</p>	<p>32 participants in Taiwan Gender: not reported Education: University students Ethnicity: Not reported Age: 18-29 (assumed)</p>	<p>Quasi-experimental No control No follow-up Facilitator not reported</p>	<p>Self-report teamwork skills Measure: Teamwork Skills Questionnaire (modified from M. C. Chien, 2000; validation N/A)</p>	<p>Improved $F(1,22) = 3.94; p = .060$ No significant effects ($p > .20$)</p>
<p>V. Wendel et al. (2013) / Minecraft (modified for the study)</p>	<p>28 participants in Germany Gender: 8% Female Education: University students and higher Ethnicity: Not reported Age: 21 to 45 years, mean 25.81</p>	<p>Quasi-experimental Single control – solving puzzle No follow-up Facilitator not reported</p>	<p>Self-report cooperative behaviour (referred to as group cooperation) Measure: Group-cooperation Questionnaire developed for study; Not validated Behavioural assessment of trust and cooperative behaviour Measure: Prisoner's dilemma game (modified from B. Sheese, W. Graziano, 2005)</p>	<p>Improved $F(1,22) = 3.94; p = .060$ No significant effects ($p > .20$)</p>

Source: own processing

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Gaining New Insights into Professional Knowledge in Digital Game Art by Taking a Design Perspective

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ABSTRACT:

Although artists contribute a great deal to what digital game players see on the screen, there is a marked absence in the literature of direct studies of artists working in digital game development. We stress the need to understand these artists' professional knowledge in a rich and contextualized manner, and beyond technical expertise. In this paper, we describe the design process carried out by an experienced technical artist during game preproduction. We report findings gained through ethnography/shadowing at the Montreal-based Red Barrels studio. We refer to pragmatist and constructivist theories of professional design practice to make sense of its reflective, collaborative, situated, and transactional aspects. This paper draws conclusions on three ideas: (1) the benefits of using design theory to examine design-like reflective skills in game art practice; (2) the utility of qualitative methods to construct a thorough, holistic, and contextualized understanding of professional practice, and (3) how a richer, more elaborate understanding of 'design' in game development points to a need for further research on the sociocultural aspects of game experience design.

KEY WORDS:

design theory, digital game artists, digital game development, ethnography, professional knowledge.

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Introduction

As in various fields of study, qualitative research has helped over the years to better understand and characterize game developers' general practice. Some studies stress the need to study developers in situated contexts and refer to ethnographic perspective: collecting data through *in situ* observations and direct interviews with developers during sufficiently long stays in studios.¹ Their results point to not only technical, but also non-technical skills (creative, collaborative, inter- and cross-disciplinary, communicative, social, and relational). For instance, though social skills such as conflict resolution are significant for developers in their daily work, these skills remain implicit or enigmatic in industry and academic discourses, in contrast to the widely-promoted technical expertise; this primarily technical focus stems from the great interest in digital games and the technologies for creating them.²

1 For example, see: O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014.; TSCHANG, F. T.: Balancing the Tensions between Rationalization and Creativity in the Video Games Industry. In *Organization Science*, 2007, Vol. 18, No. 6, p. 989-1005.; WHITSON, J.: What Can We Learn From Studio Studies Ethnographies? A "Messy" Account of Game Development Materiality, Learning, and Expertise. In *Games and Culture*, 2018, Vol. 15, No. 3, p. 1-23. [online]. [2023-05-28]. Available at: <<https://doi.org/10.1177/1555412018783320>>.

2 WHITSON, J.: What Can We Learn From Studio Studies Ethnographies? A "Messy" Account of Game Development Materiality, Learning, and Expertise. In *Games and Culture*, 2018, Vol. 15, No. 3, p. 3-20. [online]. [2023-05-28]. Available at: <<https://doi.org/10.1177/1555412018783320>>.

For about 15 years, several game design researchers have referred to design theorists (e.g., D. Schön, N. Cross)³ in order to establish a better dialogue between game studies and general design research. Indeed, these researchers want to move away from theorizations that are too focused on the game, gameplay, and player. Conversely, they want to better theorize the designer, his/her design cognition and design process. They also want to get away from the theorizations offered in canonical works by former industry designers, again mostly focused on the 'game'. In doing so, game design researchers seek to produce knowledge that can better guide game design practitioners. Design theory such as D. Schön's conceptual framework has helped to define game design activity as a situated process⁴ and to make sense of designers' situated creativity.⁵ In addition, while the game designer typically designs, defines, and represents the gameplay and experience of the game in the initial phases of projects, what s/he does in more advanced phases is less clear,⁶ for example during preproduction, when the first playable and complex prototypes are developed using digital production tools and by a multidisciplinary team.⁷ With the rationalization of production, the game designer would play a very important role at the outset, but not necessarily later, and instead, the critical effort of the whole development team would be considered.⁸

So far, little knowledge exists to understand art practice in digital game development, beyond technical expertise, although, this practice has faced many new challenges since the 1990s, due to technological innovations, increased product sophistication and production rationalization.⁹ Nevertheless, the artists ultimately contribute a great deal to the visual result that players see on the screen.¹⁰ This study stresses the need to understand game art practice in a rich and contextualized manner. Moreover, we need to understand professional knowledge by moving beyond technical expertise (e.g., tech know-how, tools, artifacts, workflow, pipeline) and looking at what experienced artists do (how/why) in their real situated studio context. This study describes the design process carried out by an experienced technical artist during game preproduction. We report find-

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- 3 See: CHIAPELLO, L.: Creativity in the Video Game Industry: Using Schön's Constants to Understand Frame Creation. In NELSON, J. et al. (eds.): *11th European Academy of Design Conference: The Value of Design Research*. Paris : Paris Descartes University, Paris Sorbonne University, Paris College of Art, ISTECS PARIS, 2015, p. 1-10. [online]. [2023-05-28]. Available at: <<https://ead.yasar.edu.tr/wp-content/uploads/2017/02/Creativity-in-the-Video-Game-Industry.pdf>>; KUITTINEN, J., HOLOPAINEN, J.: Some Notes on the Nature of Game Design. In NACKE, L. E. et al. (eds.): *DIGRA '09 – Proceedings of the 2009 Digra International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DiGRA, 2009, p. 1-8. [online]. [2023-05-04]. Available at: <<http://www.digra.org/wp-content/uploads/digital-library/09287.49313.pdf>>; KULTIMA, A.: Game Design Research. In TURUNEN, M. (ed.): *AcademicMindTrek '15: Proceedings of the 19th International Academic Mindtrek Conference*. New York, NY : ACM, 2015, p. 18-25.
- 4 KUITTINEN, J., HOLOPAINEN, J.: Some Notes on the Nature of Game Design. In NACKE, L. E. et al. (eds.): *DIGRA '09 – Proceedings of the 2009 Digra International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DiGRA, 2009, p. 1. [online]. [2023-05-04]. Available at: <<http://www.digra.org/wp-content/uploads/digital-library/09287.49313.pdf>>.
- 5 For more information, see: CHIAPELLO, L.: Creativity in the Video Game Industry: Using Schön's Constants to Understand Frame Creation. In NELSON, J. et al. (eds.): *11th European Academy of Design Conference: The Value of Design Research*. Paris : Paris Descartes University, Paris Sorbonne University, Paris College of Art, ISTECS PARIS, 2015, p. 1-10. [online]. [2023-05-28]. Available at: <<https://ead.yasar.edu.tr/wp-content/uploads/2017/02/Creativity-in-the-Video-Game-Industry.pdf>>.
- 6 KUITTINEN, J., HOLOPAINEN, J.: Some Notes on the Nature of Game Design. In NACKE, L. E. et al. (eds.): *DIGRA '09 – Proceedings of the 2009 Digra International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory*. London : DiGRA, 2009, p. 5. [online]. [2023-05-04]. Available at: <<http://www.digra.org/wp-content/uploads/digital-library/09287.49313.pdf>>.
- 7 O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014, p. 50-52.
- 8 TSCHANG, F. T.: Balancing the Tensions between Rationalization and Creativity in the Video Games Industry. In *Organization Science*, 2007, Vol. 18, No. 6, p. 994.
- 9 Ibidem, p. 995-996.
- 10 O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014, p. 50.

ings gained through ethnography/shadowing at the Montreal-based Red Barrels studio in 2018. We refer to pragmatist and constructivist design theories, such as D. Schön¹¹ and L. Bucciarelli,¹² to make more thorough sense of the design process, i.e., as reflective, collaborative, situated, and transactional. Because D. Schön saw that all professional practices are 'design-like', i.e., like that of designers in a broader sense, this lens helps to shed light on professional knowledge. The original study on which this paper is based chose this premise as its starting point, and attempted to provide a new view of the practice of 'artist-developers'.¹³

Research Focus and Theoretical Perspective

This section first outlines the current and available knowledge on artists working in digital game development. Second, it presents concepts of design theory from which we elaborated our theoretical framework. All these elements will then be considered in the methodology.

a) Artists in digital game development

Various sources¹⁴ help to understand the emergence of artists' roles and specializations in digital game development. They began to emerge in the 1990s as digital game development became more industrial and more complex, which increased the demands and budgets associated with visual art. Examples of new requirements are increased team size, a need for specialization, and high sophistication of game visual content. Depending on the size of projects and teams, the number of artists will vary, peaking during the production phase.

Existing knowledge about game artists is mostly concerned with technical expertise. For example, the GDC conferences' visual art track largely focusses on new and/or trendy techniques/methods for improving artists' creation and production effectiveness. In addition, practitioner-written handbooks usually teach the creation of game visual content in terms of tools, software, workflows and renderings. Online descriptions of industry jobs and profiles also serve to inform on art practice in digital game and other related fields. For instance, "special effects artists and animators create two- and three-dimensional models, images that appear to move, and visual effects for television, movies, video games, and other forms of media".¹⁵ Commonly, a '3D artist' oversees "the original creation of animation and graphics, using both illustration and computer programs. 3D artists often work in teams, dividing project workloads according to strengths".¹⁶ Without addressing

11 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 21-167.

12 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA : MIT Press, 1994, p. 159-191.

13 See also: HAWEY, D.: *La pratique professionnelle des artistes-développeurs de jeu vidéo : Une exploration de leur processus réflexif de design*. [Dissertation Thesis]. Montreal : Faculty of Management, University of Montreal, 2021.

14 For more information, see: O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014.; BETHKE, E.: *Game Development and Production*. Plano, TX : Wordware Publishing, 2003.; TSCHANG, F. T.: Balancing the Tensions between Rationalization and Creativity in the Video Games Industry. In *Organization Science*, 2007, Vol. 18, No. 6, p. 989-1005.

15 *Special Effects Artists and Animators*. Released on 8th September 2022. [online]. [2023-05-03]. Available at: <<https://www.bls.gov/ooh/arts-and-design/multimedia-artists-and-animators.htm>>.

16 *3D Artists: Job Description and Career Outlook for a 3D Artist*. Released on 21st January 2023. [online]. [2023-05-28]. Available at: <<https://bestaccreditedcolleges.org/articles/3d-artists-job-description-and-career-outlook-for-a-3d-artist.html>>.

the real and situated practice in studios, the online descriptions do point to a set of creative and technical skills needed to design and create 3D and 2D visual content in a game project. Some of them distinguish industry specializations (e.g., concept art, 3D modeling, environment, visual effects).¹⁷ In online descriptions, long lists of tools and software that game artists must master and/or combine reinforce this interest in technical expertise.¹⁸ Nevertheless, most descriptions assign importance to teamwork and the need for certain social and relational skills, such as “collaborative personality and willingness to work with other artists”.¹⁹

According to C. O'Donnell's ethnographic study,²⁰ artists' are significant to both the development process and the final product, as they ultimately contribute in large measure to what players see on the screen. Indeed, artists take part in the system that supports the game, which requires balancing specialized artistic and technical skills. Artists interacting with other departments (e.g., design, programming) must be familiar with the latter's languages and knowledge. Since the most experienced artists often act as 'Swiss army knives,' preproduction can be difficult for them if the programmers have not yet determined how the artistic content will flow into the game. Experienced artists are also involved in defining the methods or pipelines for all artists in the production phase. Since much more content can be placed into games over time, developers' focus has been more on the pipeline. These circumstances led for instance to the rise of technical artists, who act as mediators between the languages and interests of programmers and artists.

b) The design process as reflective and situated

Our theoretical perspective refers to design research which, for almost 50 years, has studied the designers' process. Pragmatist design theorists particularly help to understand the design process as a situated reflective inquiry and recognize professional design practice as reflective or thoughtful, D. Schön's work being a major influence.²¹ Indeed, he helped to understand professional designers as reflective practitioners and saw design practice as a model for other professional practices, since all of them are 'design-like'.²² D. Schön's paradigm intended to move away from *technical rationality*, looking rather towards *reflection-in-action-and-on-action*. In this sense, when designers cannot set or fix a problem using their prior know-how, they then reflect-in-action, i.e., they improvise, adapt, and pick the most appropriate means to their ends, such as jazz musicians often do. Designers then refer to their *repertoire of precedents* to seek familiarity, partial meaning, or solutions; they also refer to their *appreciative system* to evaluate results and surprises, based on their beliefs, taste, and values. This view abandons the rationalist and logical concept of problem (as well as the instrumental vision of the problem-solving process), to rather adopt the more pragmatic and phenomenological concept of situation. For D. Schön, professionals in real settings wish to act on, manage, and fix problematic situations caused by complexity (e.g., uncertainty, uniqueness) and/or felt states

17 *What Does a Games Artist Do?*. [online]. [2023-05-03]. Available at: <<https://www.careerexplorer.com/careers/games-artist/>>.

18 YUREKLI, Y.: *Game Artist: The Role, Salary, Software and Skills of a Video Game Artist*. [online]. [2023-05-03]. Available at: <<https://www.cgspectrum.com/career-pathways/game-artist/>>.

19 *Special Effects Artists and Animators*. Released on 8th September 2022. [online]. [2023-12-03]. Available at: <<https://www.bls.gov/ooh/arts-and-design/multimedia-artists-and-animators.htm>>.

20 O'DONNELL, C.: *Developer's Dilemma. The Secret World of Videogame Creators*. Cambridge, MA : MIT Press, 2014, p. 48-52.

21 For more information, see: CROSS, N.: *Design Thinking: Understanding How Designers Think and Work*. New York, NY : Bloomsbury, 2011.; NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, CA : MIT Press, 2012.

22 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 77.

(e.g., doubt, confusion). In order to act on a situation, professionals must first *frame* an initial understanding of it, which might be *reframed* (reconstructed) as the situation evolves. Adding to D. Schön's ideas, design researchers have pointed out that designers often face *wicked* problems, because design problems are often social and moral; they are neither well defined at the outset nor necessarily solvable (e.g., dilemma).²³ Finally, D. Schön's concept of frame has helped pragmatist design researchers/theorists conceptualize and operationalize designers' problem setting/solving skills, sense making, and interpreting initial briefs as creative skills.²⁴ Thus, design thinking skills are founded in large part on situated creativity.

Later, D. Schön's model of professional practice helped to address professional skills in contemporary and emerging design practice. Indeed, it helped to define a more thoughtful designer, i.e., a model that emphasizes reflectivity, design context, and ethical considerations.²⁵ In this sense, the designer's inquiry intertwines several forms of thinking, for example "systemic thinking" and "making good judgments". In this respect, judging a situation is linked with the Aristotelian virtue of *phronesis*, or practical wisdom, i.e., knowing how to assess the weight of each of our actions, and be responsible for them, and the possible consequences in a world where everything is interconnected. While *phronesis* would combine both aesthetic and ethical judgments, which the designer makes during the design activity, these judgments are seen as highly situated and embodied.²⁶

c) Design as social process

For many years now, design research has recognized that the complexity of products developed and design problems requires multidisciplinary teams incorporating several fields of expertise. In this constructivist trend, a strong influence is L. Bucciarelli, who defines the design process as situated and socially constructed: "a process of achieving consensus among participants with different 'interests' in the design, and that those different interests are not reconcilable in object-world terms".²⁷ Thus, within a multidisciplinary design team, members acting as experts will each have their own unique and distinct frame of reference to understand the object/artifact and the process, as they would refer to their *object world*, i.e. habitual ways of representing, acting, and appreciating, according to their own technical expertise, unwritten rules, beliefs, and values. Indeed, object worlds encompass technical specializations, dialects, systems of symbols, references, metaphors and models, unique instruments, and craft sensitivities. The concept of object world overlaps with D. Schön's concepts of frame, repertoire of precedents, and appreciative system, which professionals rely upon to act effectively in situations. To overcome conflicts of interests and values between team members, each must leave aside their own object-world, seen as comfort zones of thinking, and rather engage in negotiations and shared understandings. Finally, the transactional aspect of the design process, i.e. the reciprocity and circularity between a designer and his/her work environment, points to the importance of grasping the *context* (e.g., social, cultural, organizational, technological) in which the design process takes place, in order to better understand it.²⁸

23 For example, see: RITTEL, H., WEBBER, M.: Planning Problems are Wicked Problems. In CROSS, N. (ed.): *Developments in Design Methodology*. New York, NY: John Wiley & Sons, 1984, p. 135-144.

24 See also: PATON, B., DORST, K.: Briefing and Reframing: A Situated Practice. In *Design Studies*, 2011, Vol. 32, No. 6, p. 573-587.

25 For more information, see: NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, CA: MIT Press, 2012.

26 Ibidem, p. 57-158.

27 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA: MIT Press, 1994, p. 159.

28 Ibidem, p. 159-191.

Methodology

The observations reported were conducted during the spring of 2018, during a 3-week stay (13 days) at the Montreal indie studio Red Barrels, where we shadowed an experienced artist during preproduction of a new game.²⁹ The data was collected through *ethnography*,³⁰ with the intention of allowing flexibility and mobility. At Red Barrels, shadowing involved closely following the artist in his context of practice. This method generated very detailed, first-hand data; captured the mundane, trivial, and difficult-to-articulate aspects of organizational life; holistically and contextually captured behaviours, opinions, and actions based on lived and observed situations seen through the eyes of the shadowed artist.³¹ Our general research question was: How does the artist's design process operate during preproduction? Based on the design theory outlined in the previous section, we identified five interconnected dimensions of the design process to help examine it in detail and holistically.³² These dimensions, each corresponding to a specific aspect of design (processes), also serve to better structure our observations, thick description, and understanding:

1. *The studio context* – the social, cultural, organizational, institutional, and technological aspects of the design process taking place;
2. *The design situation* – the circumstances and felt states (e.g., doubt, confusion, uncertainty, problem, complexity) that motivate the artist to act on it;
3. *The artist's design process* – everything that he individually implements conceptually and/or artifactually to act on the design situation, after having built an initial understanding of it. This involves various activities (e.g., creating, interpreting, experimenting, proposing, evaluating);
4. *The social process of design* – the co-reflective activities and social interactions in which the artist participates;
5. *The artist's object world* – The artist's habitual ways of thinking, acting, representing, and appreciating.

Results

a) The studio context

Red Barrels is known for its successful *Outlast*³³ series of horror/adventure games which has generated considerable sales (65 mil. CAD as of spring 2018). The three co-founders acted as studio heads; they were involved in all phases of the projects and acted

29 Remark by the author: These observations were part of our dissertation thesis in which we studied 'artist-developers' through three cases between 2016 and 2018 (i.e., case = one artist shadowed in a Montreal studio over a period of 8 to 13 days). This overall study followed a multiple-case design, replication logic, and sought to identify similar patterns across the cases to make sense of a cross-cutting and more transferable model of artist-developers' practice.; For more information on the methodology, see: HAWEY, D.: *La pratique professionnelle des artistes-développeurs de jeu vidéo : Une exploration de leur processus réflexif de design*. [Dissertation Thesis]. Montreal : Faculty of Management, University of Montreal, 2021, p. 191-248.

30 HAMMERSLEY, M., ATKINSON, P.: *Ethnography. Principles in Practice*. New York, NY : Routledge, 2007, p. 3-5.

31 McDONALD, S.: Studying Actions in Context: A Qualitative Shadowing Method for Organizational Research. In *Qualitative Research*, 2005, Vol. 5, No. 4, p. 456-458.

32 For more information, see: HAWEY, D.: A Theoretical Model for Studying Design Inquiry in a Real-World Context. In LOCKTON, D. et al. (eds.): *DRS2022: Bilbao*. London : Design Research Society, 2022, p. 1-14. [online]. [2023-05-29]. Available at: <<https://doi.org/10.21606/drs.2022.645>>.

33 RED BARRELS: *Outlast*. [digital game]. Montreal : Red Barrels, 2013.; RED BARRELS: *Outlast: Whistleblower*. [digital game]. Montreal : Red Barrels, 2014.

as 'designer-deciders.' During spring 2018, the studio shared characteristics and challenges common to indie studios. Its main challenge was to develop a desirable and profitable product with its small team and available resources. The development team, consisting of 14 male industry veterans, would remain the same size from the beginning to the end of the current project. The team ably adapted to rapid changes, but could only rely on itself to develop everything and solve problems. Each member embodied certain expertise and seemed concerned with the success of the studio. The studio's philosophy encouraged coming up with ideas for the good of the product, the process, and the project. Overlap between design, preproduction, and production phases was considered normal and frequent. The studio had its own particularities. It had acquired good financial security, due to the success of the two games released. The studio heads wanted to make products close to AAA quality with a much smaller team. Regarding project management, 'CEO' (studio head, main manager, and game designer) advocated a flexible 'garage-based' formula, based on *ad hoc* and spontaneous discussions between members. He saw his team as a 'jazz band' and advocated for working based on 'gut feeling', without knowing where things might lead. Despite the organic and permissive management, it was clear that the studio heads were the main decision makers.

The new project was to develop a multiplayer game that would exploit replayability and player progression over time. The challenge was considerable, as the studio had initially specialized in producing single player and first-time experiences, which lasted between five and seven hours and were set in a closed world. Building very complex game worlds, exploiting online streaming, and adapting to the presence of other players were significant and less well understood technical challenges. These circumstances would complicate the development and use of production tools. The game concept preserved the 'adventure-horror-survival' genre of *Outlast I* and *II* and would rely on player psychology, power relations and moral dilemmas. Players would play mentally afflicted patients on whom specific experiments would be performed inside a maze prison. The goal of each player would be to survive until the end, alone or with another player. In order to progress in the game, players would have to solve puzzles cooperatively, but also sometimes betray or kill each other. Players would be able to talk to each other through gaming headsets, which would be a key element in the game experience. The studio wanted to exploit unexpected and decadent behaviours in multiplayer games (e.g., voice trolling, hacking) to create a desire to play again and to progress, to ensure the longevity of the product. The design phase began in November 2017 and mainly involved the studio heads. They had designed both the envisioned game experience (e.g., rules, narrative context) and the business strategy, taking input from the team. By February 2018, while the heads continued to design the game in textual form, preproduction had begun to develop an initial playable and evaluable prototype. To guide the prototyping, the lead game designer (one of the studio heads) had created a short document called 'The Sequence', which represented the narrative sequence for the first-time experience in terms of the player's actions, interactions, and emotions.

The artist under study worked in this context. He had accumulated 11 years of experience in the Montreal digital game industry and specialized in environment art and tech art. At Red Barrels, he was officially a level artist, but during preproduction, acted as tech artist in charge of designing and prototyping the main systems, mechanics, and interactive objects. In previous studios, he had developed production pipelines for artists and ensured technical feasibility. He had mastered the tools for creating visual content (e.g., game engine, 3D software).

b) The design situation

The artist wished to respond quickly to the needs of the designer-deciders, who wanted to obtain convincing results on the intended multiplayer experience:

- Artist: "My main task is to make the game playable as soon as possible, so to prototype [...] to make the non-existent mechanics exist, to have them in first draft, and to make sure that it's usable [...] so that we can judge them before we make decisions [...] One thing I understood: When you have an idea, a dream, until it is put in a representative enough way so that you can say 'this is my idea', nobody knows if it looks good."

The CEO wanted to see him advance the 'bottom up' while the 'top down' was being refined (by the designer-deciders) expecting that in the end, the two would come together. However, an important challenge for the prototyping team (composed of the artist under study, two programmers, and one level designer) was to understand and agree on the designer-deciders' brief. Indeed, the initial (textual/verbal) brief remained ambiguous and incomplete. The CEO himself mentioned that the game design team (i.e., the designer-deciders) did not indicate how to technically construct a first version of the game. Rather, it was up to the prototyping team to know how to interpret and implement it in the game engine. The brief was ambiguous on what the prototype should include: to explore only the first-time experience? Or also explore the longevity of the product, such as the X-time experience (replayability) and the possibility of progressing in the game, as the designers-deciders had initially communicated? In the prototyping team, these questions would lead to disagreements and distinct visions. As the artist wished to interpret the brief into a technical and visual interface, as into an experiential form, he framed³⁴ the prototype according to what the decision makers had communicated to him: to include and try out all these types of experiences globally in a first draft, and at the same time, to try out all the necessary technical means to ensure the longevity of the product.

c) The artist's design process

In the first week of the stay, we observed the development of the prototype, or what the artist called a vertical slice, i.e., a small portion of all the ingredients needed to represent the game experience. It was a complete loop of the first-time experience, starting from the moment the player logs in until they complete a game. The vertical slice would also be used to prove the technical feasibility of subsequent production. The prototype took the form of a 3D level map in the Unreal 4 game engine. While the level designer was building the basics of the level, the artist was prototyping the interrelated components essential to the game experience (i.e., game mechanics, interactive/destructible objects, visual interfaces, various systems for characters, animation, communication between players). To create these components, the artist used Unreal 4's Blueprint interface, a nodal tool that allowed him to design, experiment, test and validate himself without having to know how to code. The level under construction represented a maze inside a giant military warehouse. Each player would start in a particular elevator where their avatar wakes up. The development of the elevator required a lot of experimentation within Blueprint. The artist iteratively created and integrated it into the level. The elevator would be used to make the players suddenly feel a hostile and dangerous situation. Inside, they would see a timer, a closed door, and information about the avatars of other players. After the elevator descended into the maze, the player would be forced to enter as they saw other players exiting their elevator.

34 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 63-69.

The artist participated in many formal and informal collaborative activities with other members of the prototyping team. Scheduled meetings aimed at framing and planning the prototype (more on this in the next sub-section). Also, frequent *ad hoc* conversations with one or two colleagues, at a desk, served to clarify and synchronize the interdependent work. The artist had daily discussions with the level designer about the elevator; with the lead 3D programmer about the voice chat, log-in and multiplayer (server) systems. Through these discussions, the developers projected themselves as players in temporary/revisable scenarios and tried to anticipate the needs and constraints of production. Finally, the artist interacted with a gameplay programmer to transfer the blueprints to a clear and optimal C++ format for the programmers.

During the second week, the development of the elevator and the prototype slowed down, as it took longer than expected for the gameplay programmer to transfer the blueprints. As a result, the mechanics and interactive objects were inoperative, broken and distorted. To avoid wasting time, the artist started the task of designing the character customization system that would allow avatar customization at the beginning of the game. To do this, he worked with the character artist and the animator. The artist believed the designer-deciders would want this feature in the prototype. This task took more thought than expected, since an initial character structure (in the form of a complex system of objects and relationships) had to be determined.

In addition, the artist shared with us a strategy he was considering to playtest the overall multiplayer experience, combining first-time, X-time, and progression (e.g., accumulating perks and developing skills over time):

- Artist: "What I want is to make the team play [...] as soon and as often as possible, at least every two days. And I want us to get used to multiplaying. I want a player to be able to play a map 500 times and still say it's cool [...] So my goal is to create this embryo, to make a little fetus with what we already have in the game doc, to make the team play together and talk to each other every time we play, and try to make it progress [...] It's also to be able to live the experience, to see where the mechanics are going. But it's also to keep the prototype healthy [...] to make sure that everyone is aware of what's not working, and to always fix bugs."

According to the artist, this was the overall experience envisioned by the designer-deciders and therefore, the initial prototype had to include it entirely. His strategy was to have the studio members regularly playtest the multiplayer experience themselves so as to evaluate (re)playability and progression over time. As this experience would depend on in-game social interactions, his belief was that evaluating the latter could only be achieved by having the team systematically play the most recent builds: "By playing. That's the only way. You play and when you finish playing, if you see a buzz, sparks, then you know you have something". This tailor-made (social-process-based) solution would also keep the team informed, interested, and motivated about the prototype's progress. The team could debrief after playing to reflect on what adjustments to make. More deeply, he wanted to cultivate good habits in the studio. On the technical side, his strategy was based on an in-game voice chat system. This system would allow players to communicate with each other using microphones and headsets. This solution would enable game mechanics based on social interaction.

During the second week, the artist had assisted four colleagues to playtest the multiplayer mode. This first game consisted simply of connecting to the game, making some choices of character configuration, appearing in the maze, walking around, and seeing the characters of other players. The artist was able to prove the functioning of the planned systems and to identify the first technical problems (e.g., player log-in, interface intelligi-

bility). At the end of the second week, we were able to list several creative and collaborative tasks at the heart of the artist's design process:

- The elevator for entering the game (with lead programmer and level designer);
- The character configuration system (with the character artist and the animator);
- The basic interactive mechanics and objects (with the gameplay programmer);
- The voice chat system (with the lead programmer);
- The playtesting of the whole multiplayer experience (with colleagues).

As these tasks were initiatives by the artist to meet the needs of the designer-decid-ers in preproduction, and more broadly for the good of the project, they involved navigat-ing through parallel and simultaneous cognitive design processes. They involved collabo-rative development of tailor-made assets and systems with his expert colleagues from other departments, thus involving additional design activities (i.e., framing, experiment-ing, evaluating, revising, etc.). In the process, the artist expected to adapt his work as the game's rules, mechanics, and storyline became better-defined. Furthermore, these tasks were largely tackled through *ad hoc* meetings and conversations; the artist and his col-leagues frequently had short meetings around a desk to evaluate/synchronize their work, but also to (re)discuss and clarify the design of the game experience. From these tasks, we understood that the artist took responsibility for coordinating the prototyping, the team, and the technologies. While he wanted to prove the technical feasibility of operationalizing the envisioned game experience, he also wanted to inform, facilitate, and motivate the colleagues involved:

- Artist: "Acting in the same direction, yes. Synchronizing, yes. Because I have to know what [the lead programmer] is working on to synchronize with him and to be optimal [...] when I know that someone is doing nothing for the prototype, I will often try to see him [...] so that we converge at the same time as quickly as possible [...] I'm the one who organizes myself. In the end, these are requests that I make. It's not a dicta-torship. We all work in a democratic way. But we all have a common goal that makes us get along. We go about it with common sense [...] I certainly talk a lot to people. At the same time, it may come naturally. It's not imposed, it just feels right."

Acting as coordinator and designer seemed to be the subject's way to design a pri-mary workflow in order to facilitate and maintain cohesion between interdepartmental tasks; between the different components of the prototype. He designed the missing parts of the brief in order to act efficiently for the project. Sadly, the artist was not able to com-plete the core tasks of his design process during our stay, a result we attribute to the unforeseen complexity of his tasks and of the design situation.

d) The social process of design

Two formal meetings illustrate well how the artist's design process intertwined with a social process of design³⁵ and how he had to show willingness to negotiate with his colleagues. The framing meeting aimed to delimit the prototype in terms of minimal value product, i.e., to agree on the scope, specification and prioritization of its content and container. The planning meeting aimed to organize its development and served the designer-decid-ers to get opinions from the bottom-up experts. In both meetings, each member acted as a departmental expert in respect of the prototyping. Three members were constantly present in both meetings: the artist shadowed; the lead prog acting as the programming systems expert; the CEO acting as manager and spokesperson for the

35 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA : MIT Press, 1994, p. 159.

designer-deciders. Circumstantially, other experts were present (e.g., character animator, gameplay programmer, level designer). In both meetings, the same tension opposed the artist's vision of how to frame the prototype and its development with that of the lead prog. The CEO mediated this tension and made decisions at the end of each meeting. An excerpt from the framing meeting illustrates distinct visions:

- Lead prog: "It's actually a gameplay meeting. The essence is there: what is fundamental in the game to make it fun? And I will say, for the first time you play the game. I'm not talking about when you play 50 times, 100 times, and it stays interesting afterwards. [...] what's the minimum you need in terms of mechanics, gameplay, and production?"
- Level designer: "I think it takes a little bit of each mechanic [...] that you want to test [...] a base of each to have a variety of interesting gameplays."
- Artist: "The problem is that a little bit of each means you have to do everything. And I think that what [lead prog] is afraid of is that if you want to do all the mechanics, well it's going to take a big structure; thinking about everything, planning everything."

In the lead prog's view, the prototype should demonstrate the first-time 'fun' experience and be kept to a minimum. In contrast, the artist, the CEO and level designer all wanted to maximize the creation of options, exploration and discovery. Their shared vision was more tolerant of risk and uncertainty and sought the most interesting value for the product:

- CEO: "If we're talking about doing something in Blueprint that takes half an hour and we can quickly test and get an answer... and then we ask you to do it in code?"
- Lead prog: "I say right now, do we need ladders? Well, maybe... So that means no."
- CEO: "You have to give yourself some leeway. You shut us down right away."
- Lead prog: "We make a list of what we need, not what we might need."
- Level designer: "We need the ladders."
- Lead prog: "I agree. You can make a ledge and then put a ladder mesh. But if you want to do a complex ladder mechanic..."
- Artist: "No. We are in prototyping! We've been talking about ghosting on a rail since the beginning. We're talking about opening doors without hands. We're in that stage right now [...] Honestly, most of this stuff, I've already prototyped in Blueprint. And you know what? They're easily breakable! The edges cases are not covered but we are able to test them to see if the mechanics are potentially good. But here, you want to scope the game right away, but you don't give the mechanics a chance to prove themselves. If we don't try, we won't know."

We later understood that during the iterative development of the game, the lead prog was afraid of having to constantly review the entire architecture of the code. It was easier for him to iterate on small elements of that architecture. Next, in the planning meeting (featuring artist, CEO, lead prog), the artist proposed and defended his playtesting strategy, starting by asking a question to his two colleagues:

- Artist: "How are we going to test our system of player persistence over time, perks accumulation, and online progression? [...] everything can be done first draft. But we have to plan our stuff."

The artist was trying to interest them in framing the prototype to include the overall game experience (first-time, X-time, progression). In contrast, his two colleagues saw this as secondary, as long as the first-time experience was not prototyped and the design team had not achieved consensus on this question:

- Artist: "We can make a game. [...] We're able to have a database here to accumulate our junk. A kind of a session where we keep our progress in-house. Then as we play, we try out perks, unlocks [...] We could easily have a system [...] that we can start testing by ourselves, like our other mechanics. Why can't we test our own perks?"
- Lead prog: "Well, it's balancing the tests. It's not about knowing if they work."
- Artist: "Yes, but at least to try our perks. Balancing them after that is one thing... everything needs to be balanced: the height, the length of the jump, the strength you kill."
- Lead prog: "Yes, we're going to try them out before we have them tested by other people. I don't understand what you mean."
- Artist: "That's because our perks system... well we need to have it to test it, and it's nowhere in our planning."
- Lead prog: "The game has to be fun without anyone having perks [...] That comes later."
- Artist: "I don't feel it's a huge task. I just feel like we need to do it. And give ourselves a chance. [...] if we play our [first-time experience] in house, our incentive to finish a round is not big. But if we have a parallel game, where we have a progression... Each time we plug in, at the beginning we're all naked, we have nothing. Then at some point, we see that [Art director] has a hat, glasses, 2-3 clothes ...let's say that's our perks... and he's the only one who has that, maybe [Animator] too, ...our 2 best players... There's a kind of competition that's going to sprout within our team, that's going to be more representative of what's going to be on the outside. If we want to have a game that works in the long term through multiplayer progression, I think we should also represent it in our internal tests. Because if not, we're just going to represent a part of our game; we're giving ourselves only part of our chances to win."
- Lead prog: "I agree with what you're saying [...] Yes, it's cool to add, yes, it's important before you ship a game, but the game has to be fun without it. You don't want the people to play for the meta and not have any fun, or only have grinding... But your game has to be fun to play first. And the meta is the cherry on top of the Sundae."
- Artist: "That's a philosophy."

The lead prog's vision (shared with the CEO at the time) did not see player progression as essential to include in the prototype. In addition, the CEO mentioned that the designers-deciders were not yet discussing the progression experience. The artist then asked his two colleagues what the total game experience would be in the end and what the prototype would include? He pointed out that his vision and proposal were derived from the initial intentions of the decision-deciders. He was already technically capable of prototyping the whole experience. According to him, a prototype without replayability and progression would not be enough to understand the longevity. It would only allow understanding a part of the total experience. Throughout the meeting, the artist and lead prog would remain in disagreement. The CEO downplayed the urgency of deciding on the prototype's scope right away.

e) The artist's object world

Shadowing the artist allowed us to sketch out his object world³⁶ understood as his ways of thinking, representing, acting and appreciating. Not surprisingly, technical expertise, gained through years of experience, remains central. This helped him to build up

36 BUCCIARELLI, L.: *Designing Engineers*. Cambridge, MA : MIT Press, 1994, p. 159-191.

know-how and a repertoire³⁷ for designing and creating complex digital artifacts and artifact systems, through the many projects, situations, studios, teams, roles, tools, and methods. At first glance, he knew how to instrumentalize specialized knowledge from 1) fine arts (e.g., visual language, lighting, composition); 2) software (e.g., game engine tools and interfaces; 3D modelling); 3) language of digital games; 4) organizational approaches to development (e.g., Agile).

In addition to his expected roles of level/technical artist, he also embodied a bottom-up expertise in the technical means of production. This expertise encompassed a range of know-how: designing and creating custom, playable and complex prototypes in the game engine based on initial concepts and available technical feasibility; transferring initial ideas into virtual artifacts and systems (e.g., interface, interaction, code, visual content, etc.). As a bottom-up expert, he acted 1) to inform the top-down experts about technical feasibilities, experiments in progress and results already obtained; 2) to anticipate the technical challenges and constraints of production; 3) to adapt to the evolution of the brief from the top-down experts (i.e., the iterations of the game experience in conceptual form).

The artist represented digital game experience/development in complex, holistic, and systemic manners, as designers do in general.³⁸ For example, in his view, the final game experience could not be subdivided at the outset into separately or sequentially developed elements. In this sense, the prototype had to include a small slice of each element that would be part of the final product; it had to include interconnected and inseparable types of experience. Since the whole experience would have to be iterated into better versions, it could not be minimally developed without all the essential components (e.g., game mechanics, character, and animation systems). At least during prototyping, this contrasted with a more reductionist vision of the game experience and development held by his colleague the lead programmer. In addition, the artist saw the game development as a system of interdependencies between competencies of different departments working towards common goals and knowledge. In this sense, interdepartmental tasks must be synchronized and coordinated.

The artist's modes of action and appreciation were oriented towards maximizing production efficiency, both technically and socially. This took the form of underlying principles, which significantly gave insights into his skills of judgment and thoughtfulness.³⁹ He found it important to faithfully apply the designer-deciders' initial intentions as closely as possible before questioning them; a 'good' prototype would embody their "dream" in this way. During preproduction, he valued the playtesting in game mode as the only way to evaluate, validate, and iterate the prototype. While he valued effective time management (prioritization, organization, optimization) and wished to act correspondingly, he also valued actions and decisions based on the interests and concerns of his colleagues, to minimize the impact on their workload. Taking on the complex role of designer and coordinator at the same time was his way to act for the 'good' and effectiveness of the project at hand. Acting as coordinator seemed convenient for applying personal principles: to get the whole team interested, motivated and well informed. While he could propose ideas, he understood that the final decision would not necessarily be his.

The artist's tailor-made playtesting strategy and its implementation clearly underscore his personal interests, values and views on the design situation and the sociocultural context with which he was transacting. At the same time, this highlights aesthetic

37 SCHÖN, D.: *The Reflective Practitioner: How Professionals Think in Action*. New York, NY : Basic Books, 1983, p. 60.

38 CROSS, N.: *Design Thinking: Understanding How Designers Think and Work*. New York, NY : Bloomsbury, 2011, p. 3-15.

39 NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, MA : MIT Press, 2012, p. 139-158.

and ethical judgment skills, as well as situated creativity.⁴⁰ To him, this strategy seemed to be the best solution to act for what he understood as the 'common good' (of players, colleagues, product, project, studio); to seek a better player experience and answer the concerns of influential colleagues. He valued this strategy as it would truly put colleagues in the players' shoes and make them understand the progress of the game. With this strategy, he wished to cultivate better work habits in the studio, for instance, adopting a common perspective and goals within the team (e.g., caring for the little fetus, keeping 'our' game healthy, etc.).

Conclusion

This study intended to shed light on professional knowledge in digital game art practice in a richer and contextualized manner, and beyond technical expertise. To do so, we referred to design theory and qualitative method to construct a framework that enables capture and analysis of detailed yet holistic observations, thereby enabling us to study the design process in real settings. This helped create a thorough understanding of professional aspects in the design process of an experienced artist-developer. We conclude with three main ideas for future research.

Firstly, the study shows that existing design theories can be used to generate new insights about professional knowledge other than technical expertise in digital game art practice. This lens helps to formulate a temporary/revisable theoretical proposition: that experienced artist-developers can be studied and understood as design-like reflective practitioners; that we can make sense of their non-technical professional knowledge as we do with professional designers in general. Though further research is needed, this proposition could constitute a new way of understanding digital game art practice, a way that could be significant in high-end training of practitioners. Findings corroborate those of previous studies on game developers in general, about how technical expertise intertwines with creative, collaborative, communicative, and personal skills. Moreover, understanding these skills as a design-like reflective practice can help make sense of how and why experienced artists design and prototype using 'street smarts', i.e., based on a particular and situated socio/cultural/technological context.⁴¹ This does not cleanly split into soft and hard skills, as experienced artists would operationalize it as a unified whole in design situations. In addition, this design-like reflective practice highlights their professional disposition for making good judgements based on ethical and social considerations. For example, the artist studied wanted to act and did act relevantly, efficiently, and responsibly based on the needs of the moment, the available resources and for the good of the players, the colleagues, the project, and the studio. Thus, during preproduction at least, his ethical and humanistic goals noticeably led his technical means. What he designed was not only artifactual and technological, but strategical and propositional as well, again, based on his disposition and understanding of situation and context.

Secondly, the study reveals the benefits of qualitative study and analysis of practice. It provides a thorough, holistic, and contextualized understanding of professional practice, i.e., based on these interrelated aspects: a singular practitioner, his prior know-how,

40 NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, MA : MIT Press, 2012, p. 156-158.

41 Remark by the author: Using street smarts would be very close to the virtue of *phronesis*, as discussed above and described in: NELSON, H., STOLTERMAN, E.: *The Design Way: Intentional Change in an Unpredictable World*. London, Cambridge, MA : MIT Press, 2012, p. 58.

a situation, and his context of practice. This is precisely what online job descriptions and handbooks don't offer, as they wish to remain short, prescriptive, and objective. In this respect, a shadowing strategy can be very helpful to grasp practitioners' implicit/explicit principles and motivations for mobilizing required skills in and for action, and to articulate and understand what they take as meaningful and necessary in their work context. Although more research is needed, this points to the importance of further exploring digital game art practice in a complex manner and real studio settings, in line with what ethnographic studies have already advocated for developers more broadly. Providing a more holistic and contextualized understanding of digital game art practice would potentially serve pedagogical purposes in high-end training of future artists. Future studies could include a longitudinal component across multiple phases to examine whether conclusions drawn from relatively few weeks of observations during a single phase stand fast across an entire project.

Thirdly, the study offers a deeper understanding of what 'design' means in game development and indicates directions for future game design and game studies. Indeed, as design activity is not exclusive to game designers and studio heads, findings show how other design experts (e.g., artists, programmers) play a significant part in the design of the game experience and its development methods. This points to the need to study design culture in digital game development more thoroughly, as it would encompass both cross-disciplinary and specialized intra-departmental knowledge. Future research could pay more attention to the social process of designing the game experience and the distinct worldviews involved. For example, researchers could study the collaboration and negotiation process during early phases of a game project (e.g., the conceptualization of shared interests, values, and understandings, as well as the designing of shared methods and pipelines). In addition, the top down/bottom up relationship could be explored in more depth, as it would involve parallel and complementary design processes of the game experience; it would also involve issues of power and conflict within design conversations in game development.

In order to add strength to the study, the artist shadowed had validated the prior results by stating that his design process was sufficiently transferable from one project to another, from one situation to another. While it is impossible to generalize from a single case, we wished to offer an original theoretical proposition, as well as contextualization and embodiment of game art practice. One important limit was the researcher's familiarity with the practice and the person studied. However, in keeping with the subjectivity desired and implied in a qualitative study, the understanding of the lingo and situations would not have been as evident without good prior knowledge. The subjective stance of the researcher implied taking the perspective of the artist under study, in order to understand his organizational reality from his point of view.

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Factors Influencing the Quality of Digital Game Localization

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ABSTRACT:

Software localization is an integral part of a business process as long as a company wants to sell their software products on a global scale. The purpose of the following article is to provide information about some key features of the development and publishing process that have a significant impact on digital game localization from English into Slovak. The selected features are based on a study by M. Kabát on localization aspects of non-gaming software that are here adapted to digital game localization, and on the author's practical experience. Each key feature is briefly introduced and its impact on digital game localization is described. Where necessary, examples are provided. Other than presenting key features of digital game localization, the intent behind this paper is to spread information on digital game localization as I believe that, e.g., developers should be more informed on this topic to create more effective cooperation with localizers and in that way higher quality localization.

KEY WORDS:

development, digital games, English, localization, Slovak, variable.

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Introduction

Like any type of translation, localization, with localization in this paper meaning the translation of software, digital games¹ and websites,² has its own specifics. Since localization has not received much attention in Slovakia compared to other types of translation, some basic features of localization of digital games from English to Slovak need to be highlighted. It needs to be stressed that this paper will mainly focus on the rules of localization of digital game software (digital games), as other features come into play when localizing non-gaming software and websites, which are often very specific or seemingly the same, but manifest themselves differently, and which are addressed in another paper.³ In addition, examples of translation will only be provided where necessary to better explain the problem at hand.

The paper aims to contribute to knowledge on digital game localization from English into Slovak. While for example in Poland (also a Slavic language using country), research on digital game localization seems to be better established,⁴ research on digital game localization in Slovakia began only recently with the most prominent scholars on this topic

1 Remark by the author: The article uses the term 'digital game' although the term 'video game' is still the preferred term in Translation Studies and digital game localization research.

2 JIMÉNEZ-CRESPO, M. A.: Localisation Research in Translation Studies: Expanding the Limits or Blurring the Lines?. In DAM, H. V., BRÖGGER, M. N., ZETHSEN, K. K. (eds.): *Moving Boundaries in Translation Studies*. London, New York, NY : Routledge, 2019, p. 26-27.; KABÁT, M., KOSCELNÍKOVÁ, M.: Lokalizácia a jej miesto v translatológii. In *L10N Journal*, 2022, Vol. 1, No. 1, p. 11-12. [online]. [2023-05-30]. Available at: <<https://l10njournal.net/index.php/home/article/view/11/1>>.

3 See also: KABÁT, M.: Pár poznámok k špecifikám lokalizácie. In KABÁT, M., PODLUCKÁ, L. (eds.): *Prekladateľské listy 8*. Bratislava : Comenius University in Bratislava, 2019, p. 21-34.

4 For more information, see: KUDŁA, D.: History of Video Game Localization in Poland. In *Studia Translatorica*, 2022, Vol. 13, No. 1, p. 127-146. [online]. [2023-05-14]. Available at: <<http://www.studia-translatorica.pl/en/articles/13-7>>.

being M. Koscelníková and M. Kabát. They focus on terminology, localization training and other aspects, however a more practical insight into the topic of digital game localization is still missing.

Methodologically, the paper is based on a parallel paper⁵ dealing with non-gaming software, since it is assumed that the localization problems are more or less the same in both cases, but in different contexts (user software vs. digital games). To verify the claim that the localization problems in these two types of software are the same, a corpus of digital game texts was created and analysed by hand. The corpus consisted of texts from various digital games and together contained 30,452 words. The corpus was analysed by hand. During the analysis similar text instances to those mentioned in the already mentioned parallel paper were sought. Finding a similar issue in the corpus meant that the issue was present in both non-gaming and gaming software as well, thus it is present in among the selected features.

Selected Features

Currently, there is no text that generally summarizes the issues of English to Slovak digital game localization. While there are partial documents,⁶ these reflect the issue of localization of software products in general and do not focus specifically on the issue of localization of digital games. Thus, the aim of this paper is to list as many crucial elements that influence the translation of game software as possible, and to give examples of their arising in practice. At the same time, it should also be noted that this paper does not address the translation of subtitles or dubbing, as these aspects, while forming part of many digital games, are rather the domain of audiovisual translation.⁷ Nor does the paper directly address the issue of intertextuality, which can occur in digital games,⁸ but is equally inherent in other types of translation.

Variables

Software contains strings of text with so-called variables - variable units. These are placeholders or tags (e.g., %s, %d, <0>, <1>) that are replaced by different numeric or textual values when the product is used⁹.

The localizer must be careful with variables, as their violation or removal could result in the software's malfunctioning or being completely inoperable. The localizer must discover the meaning of the variable and also what syntactic constituent it will be replaced with in order to be able to adjust the syntax of the sentence appropriately.

5 For example, see: KABÁT, M.: Pár poznámok k špecifikám lokalizácie. In KABÁT, M., PODLUCKÁ, L. (eds.): *Prekladateľské listy 8*. Bratislava : Comenius University in Bratislava, 2019, p. 21-34.

6 For more information, see: KABÁT, M., KOSCELNÍKOVÁ, M.: Training Localization. In DJOVČOŠ, M., ŠVEDA, P. (eds.): *Translation and Interpreting Training in Slovakia*. Bratislava : STIMUL, 2021, p. 157-170.; KABÁT, M.: *Všeobecná štylistická príručka pre lokalizáciu softvérových produktov*. Bratislava : STIMUL, 2022, p. 125.

7 O'HAGAN, M., MANGIRON, C.: *Game Localization: Translating for the Global Digital Entertainment Industry*. Amsterdam, Philadelphia, PA : John Benjamins Publishing Company, 2013, p. 250.

8 BODIŠOVÁ, K.: Intertextovost a kultúrne špecifiká pri lokalizácii videohier. In *LION Journal*, 2022, Vol. 1, No. 2, p. 40. [online]. [2023-05-30]. Available at: <<https://lionjournal.net/index.php/home/article/view/5>>.

9 *Localization Guide, Variables*. [online]. [2023-05-30]. Available at: <<http://docs.translatehouse.org/projects/localization-guide/en/latest/guide/translation/variables.html>>.; KABÁT, M.: *Všeobecná štylistická príručka pre lokalizáciu softvérových produktov*. Bratislava : STIMUL, 2022, p. 125.

Variables pose the biggest problem in software localization and are one of the most characteristic features of localization. What follows are some examples to show the problematic nature of variables in software (O stands for original sentence, T for translation).

- O: %s was kicked from the game.
T1: %s bol vyhodенý z hry.
T2: Hráč %s bol vyhodенý z hry.
T3: Hráč (%s) bol vyhodенý z hry.
T4: %s bol/-a vyhodенý/-á z hry.

The above example shows the basic problem that variables create in a text. The player's name replaces the %s variable in the example. If the T1 translation were used, there would be a problem with gender in the Slovak version, because Slovak distinguishes gender in the verb as well (vyhodенý stands for male, vyhodенá for female). An erroneous message could appear in the digital game, e.g., Maria Kabatova bol vyhodенý z hry.

Therefore, localizers insert a descriptor (a prefix word or a descriptive word) in front of the variable, to which the other parts of the sentence are grammatically linked (in this case with the masculine gender, because a generic masculine is used) and the sentence will be grammatically correct as in T2 and T3, e.g., Hráč Maria Kabatova bol vyhodенý z hry.

Such a procedure could also be objected to and it is suggested to use a form with a slash, as can be seen in the T4 translation. However, slashes are often better avoided. In some software, and especially in programming languages, they can create problems, fragment the text, and style guides (which will be discussed below) often prohibit the use of the version that can be seen in the T4 translation.

- O: %s's Head.
T: Hlava hráča %s.

A similar approach is used in the second example. Again, a descriptor was placed in front of the variable. This time, the problem is not created by the genders of the words, but by the inflection. Since the word that will replace the variable will always be in the nominative case, it is impossible to create a smooth translation. However, a localizer can help themselves by using a descriptor, so that instead of an incorrect sentence such as: Hlava Marian Kabat, the grammatically correct version Hlava hráča Marian Kabat is displayed.

- O: { *PLAYER* } sent you...
T: { *PLAYER* } vám posielala...

In this case, the variable is { *PLAYER* }, so it cannot be translated (translating a variable would lead to an error). However, it is made quite clear what will be inserted instead of the variable. Furthermore, since the sentence can be formulated so that the variable represents the subject (so it will be in the nominative case), there is no need to use a descriptor. On the other hand, in the next example, the situation becomes more complicated.

- O: { *PLAYER* } was doomed to fall by { *SOURCE* } using { *ITEM* }.
T: Hráč { *SOURCE* } porazil hráča { *PLAYER* } pomocou predmetu { *ITEM* }.

This message contains up to three variables, and it's always clear what they will be substituted with. The variable { *SOURCE* } may cause a problem for the localizer, but based on additional context, they would know that it is the name of another player.

With this translation, descriptors can no longer be avoided and a translation like the one in the example needs to be used. In a digital game, the player would see a message like this: Hráč Maria Kabatova porazil hráča Marian Kabat pomocou predmetu meč. At this point it should be said that such a sentence is not stylistically perfect, but it contains all the necessary information and conveys it in a comprehensible and grammatically correct way.

One more thing to say here about variables is that the localizer needs to take care to not accidentally confuse them, because mistakes could result in a translation with incorrect naming of the winner and the loser. This implies a simple rule: the order of the variables may be changed, but their content must not be changed.

O: Autosaving in %d...
T: Automaticky sa uloží o %d...

This example shows that a variable can also represent time, in this case the time remaining before autosaving the game. There is no need to use a descriptor here, as the sentence can be formulated to sound natural and fluent without one. The following is another example where a variable replaces a number.

O: You received %d swords.
T1: Dostali ste %d meče.
T2: Dostali ste %d mečov.
T3: Dostali ste meče (%d).

While in English there is only one plural noun form (by adding the -s at the end of a word), in Slovak two forms can occur (numbers 2-4 are created with the accusative and 5 or more with the genitive). Since a localizer does not know what number is used in place of the variable, the T1 or T2 translations cannot be used. The solution to this problem is the T3 translation, where it is indicated in the text what the user has added, and then the variable is used in parentheses so that the number appears after the text. The resulting text would then look like this: Dostali ste meče (6).

O: You received {0, plural, one {sword}, other {# swords}}.
T: Dostali ste {0, plural, one {meč}, few {# meče}, many {# meča}, other {# mečov}}.

This last example of variables uses the ICU (International Components of Unicode) syntax, which, when localizing strings with pluralization variables, allows the localizer to add the necessary grammatical forms to the variable, thus producing a translation that will ultimately be both grammatically and stylistically correct. In the above example, the player will see in the game one of the versions (Dostali ste meč./Dostali ste # meče./Dostali ste # meča./Dostali ste # mečov.) depending on how many swords they actually receive. The individual parameters in the variable represent these numbers: one = 1, few = 2 to 4, many = decimal, other = 0 and 5 or more.

Character Limits

Character limits are also typical for localization. Localizers often have to work with texts that have a given length which cannot be exceeded, otherwise the text would interfere with graphics or not fit in dialog boxes. To help with character limits, good

internationalization (generalizing the product so that it can work with different linguistic or cultural conventions) can help, for example by making dialogue boxes at least 30% larger, thus creating more space for localizers to deal with them. The use of abbreviations is recommended only in extreme cases, as the user might not decipher them correctly or not understand them at all.¹⁰ To better visualize character limits in the context of digital game localization, an example (all of the following examples are taken from *Super Lucky's Tale*¹¹).

O: Welcome, young Lucky. I've created the most devilish, devious levels you've ever seen!<page>Cross these pits of peril, and you'll earn something more precious than diamonds or a gift card: my undying respect! And a gift card.

The character limits in the example are represented by the <page> variable, which indicates where in the game the page turns, i.e., a new dialogue bubble appears. In this case, the localizer should be instructed on how many characters (including spaces) each page can contain. If this doesn't happen, the localizer tries to produce a natural translation, but one that is not much longer than the original. If the translation exceeds a character limit, the error should be spotted by a language tester (described below), who will return the translation for reworking even with the maximum number of allowed characters.

Text Fragmentation

Another feature of localization is text fragmentation. Text fragmentation occurs because the text to be translated is completely or partially separated from the source code during the localization process, so that the text reaches the localizers in the form of text strings. These often do not follow any logical order and the localizer does not even know where the text appears. When localizing digital games, this problem manifests itself in that the localizer sometimes does not know which character is speaking. Thus, this problem is also closely related to blind translation (below). The following model situation can occur.

O: Amazing! I don't have a formula for how well you did! If I did, it would be Lucky squared over awesome times something, something. We aren't buying anything! Well... unless you have those thin mint cookies...

In this case, the localizer does not know if both lines are spoken by one character or two different ones. Even though correct punctuation is used in the lines, punctuation cannot be used as monologue delimiter (e.g., a character can say several sentences before a second character starts speaking). However, as mentioned above, the text to be translated is only partially separated from the source code, and the localizer could also provide such additional information to the text.

"XML:Text", 42; "Default\$\$FTON_Hub_AnnieLyd_Dialogue_08"

"XML:Text", 42; "Default\$\$FTON_Hub_Door_Dialogue_01"

10 O'HAGAN, M., MANGIRON, C.: *Game Localization: Translating for the Global Digital Entertainment Industry*. Amsterdam, Philadelphia, PA : John Benjamins Publishing Company, 2013, p. 159.

11 PLAYFUL STUDIOS: *Super Lucky's Tale*. [digital game]. Redmond, WA : Microsoft Studios, 2017.

Of the two sentences, the parts before the word Dialogue are the most important, because they indicate the character who will say the line (AnnieLyd and Door). Since the names are different, it is obvious that the lines will be spoken by two different characters, which makes the localizer's job easier. However, if the localizer does not get such information even when asked, they have to work in the dark, trying to create a neutral translation (they try to generalize so as not to misgender the character or the object) and they also rely on a language tester.

Blind Translation and Its Causes

Localizers also must deal with blind translation during the localization of digital games. Blind translation means that the localizer has minimal or no context available to help translate the text strings correctly. There are several reasons for this. One is the fragmentation mentioned above. The other is the fact that translation occurs during software development (which is discussed below), and thus localizers do not have a finished version in which to check context. The third is the poor quality of the so-called localization packages (kits – a collection of materials for localizers), which contain reference materials. This is why inaccuracies often occur in translation.

To help reduce the impact of blind translation, localization kits can be prepared that also provide localizers with context. In addition, localization tools are being developed that allow working with text even within the source code and additionally offering a preview of the final product. Thus, the localizer can see where the translated text appears. The following is a simple example of blind translation.

O: Welcome, young Lucky. I've created the most devilish, devious levels you've ever seen! <page> Cross these pits of peril, and you'll earn something more precious than diamonds or a gift card: My undying respect! And a gift card.

This monologue was already used once before, but it can be used to illustrate the problem of blind translation as well. The localizer does not know whether the character who utters it is male or female, so the localizer cannot form a clear concept of the translation. In order to eliminate the problem of blind translation at least partially, the localizer can also look for help in the part of the source code that looks like this.

"XML:Text", 42; "Default\$\$FTON_Hub_Brett_Dialogue_01"

According to this, the localizer will detect that the monologue is spoken by the character Brett, so the translation will be written using the male gender. It needs to be stressed once more that if the localizer does not receive such information, they cannot be sure what character will say the line, and hence negative shifts may occur in the translation. This shows the importance of subsequent language testing.

One of the causes of blind translation is translation during development. Translation starts during product development. Therefore, the texts that localizers work with can change at any time. Translation is done during development because companies strive for

so-called sim-ship, i.e., the simultaneous release of all language versions of a product.¹² The fact that products are localized during development is one of the reasons for the occurrence of blind translation. This is because if there is no final product, it cannot be used as reference material.

On the other hand, it often happens that the client approaches the localizer to edit certain parts of the translation because changes have been made to the original text during development, which may affect the translation. The following sentence with a description from the code can be used as an example of this problem.

O: Hard to choose? Oh, I know. I've been staring at these for longer than I'd like to admit. "XML:Text", 42; "Default\$\$FH_02_Gillielisland_Middle"

Since it is not logical for an island (Gillielisland) to say the line in the context of the digital game in question, as the code implies, it is not known which character said the line. Furthermore, when translating during development, the localizer cannot even identify who said the sentence from other parallel material (e.g., when translating updates or expansions, they can use YouTube to help them find videos of the game).

Another problem is what the word *these* refers to. Here the localizer has no context and must decide. Therefore, the localizer must either try to create a translation that does not imply any gender, or they can rely on a language tester that might (but might not) detect the error. It is preferable to produce a gender-neutral translation that is vague but avoids an error caused by misnaming an object or assigning the wrong gender to the character. Furthermore, in such a case, communication with a developer who can answer any questions the localizer may have can help.

Another cause of blind translation is so-called *sim-ship*. Sim-ship is a term derived from the phrase simultaneous shipment, which means that localized versions of a product should be released on the same day (or a few days apart) as the original product. This is due to the fact that the highest sales occur in the immediate weeks after the release of the original product, and developers want to avoid potential profit losses.¹³ Moreover, this is how companies want to prevent or at least limit illegal copying and distribution of software.¹⁴

Thus, sim-ship is closely related to the development and creation of language mutations of a product. Again, then, it is one of the reasons why blind translation occurs.

Teamwork

Localization projects are almost always large projects, so teamwork is typical for localization.¹⁵ Therefore, localizers also most often work in teams that include editors, terminologists, and language testers in addition to the localizers themselves.

In this case, it is very important that the localizers have a unified terminology database (either online or as part of a CAT tool), which is developed in advance by a terminologist,

12 ESSELINK, B.: *A Practical Guide to Localization*. Amsterdam, Philadelphia, PA : John Benjamins Publishing Company, 2000, p. 111.

13 See also: FRY, D.: *The Localization Industry Primer*. Féchy : SMP Marketing and the LISA, 2003.

14 O'HAGAN, M., MANGIRON, C.: *Game Localization: Translating for the Global Digital Entertainment Industry*. Amsterdam, Philadelphia, PA : John Benjamins Publishing Company, 2013, p. 234-235.

15 For more information, see: SMOLÍK, M.: Lokalizácia softvéru ako tímová práca. In GROMOVÁ, E., ŠOLTYS, J. (eds.): *Odborný preklad 4: Materiály zo seminára Informačné technológie a ich terminológia*. Bratislava : AnaPress, 2009, p. 31-48.

because otherwise there is a risk of terminological differences. This is also where a style guide comes into play, which ensures that the translation is consistent even though it is produced by several localizers.

It is also beneficial for the team members to have a way to communicate together in order to translate consistently and seek advice for various translation problems. Anonymizing the team members may result in inconsistencies in the final product.

CAT Tools

Localization is associated with the software industry, and it is therefore not surprising that it is characterized by the use of various technologies, among them being translation tools. As localization is primarily carried out in teams, it is essential to maintain consistency, which is facilitated, for example, by CAT tools with a translation memory.¹⁶

On the other hand, CAT tools can also cause fragmentation of the source text, as they sort the text during segmentation (typically turning each sentence of the original into one segment for the localizer to translate), resulting in a typical example such as that provided in the section on fragmentation.

Testing

Before a localized product is released, it must undergo testing that goes beyond traditional proofreading. Localization distinguishes several types of testing: linguistic, technical, functional, and testing of the internationalized version.

During linguistic (language) testing, the person doing the testing (tester) should detect any language errors. It should be noted that the tester does not compare the original with the translation, but only checks that all the text is displayed correctly, does not exceed the boundaries of a window or button, meets the requirements of a style guide, etc. During testing, possible character limits may be found that the developers did not foresee at the beginning, so the client may approach the localizer to modify and adapt the translation to meet the character limits. Similarly, the language tester should detect errors that have arisen from insufficient context (such as those mentioned above).

Post-release Updates

The localizer's work does not stop after a software is released. It is common for software to receive updates long after release, e.g., in the form of patches (designed to fix various technical bugs) or other types of updates. This means that the localizer "has to check all the changes that have taken place in the texts and translate what is needed".¹⁷ CAT tools are used to keep track of changes.

16 O'HAGAN, M., MANGIRON, C.: *Game Localization: Translating for the Global Digital Entertainment Industry*. Amsterdam, Philadelphia, PA : John Benjamins Publishing Company, 2013, p. 120.

17 PETRŮ, J.: *Video Game Translation in the Czech Republic – From Fan Era to Professionalism*. [Master Thesis]. Brno : FF MU, 2011, p. 57.

There are some advantages for the localizer in translating updates. The biggest is that the product has already been released, so more context is available. The additional context can be provided to the localizer by the client, they can find it themselves, or they can often be helped by YouTube videos, e.g., let's plays.

Style Guides

A style guide is basically a list of rules and recommendations localizers should follow in order to work as a team to produce a coherent and consistent translation. It should be noted that style guides are not only part of localization projects, but are also used by other institutions, e.g., the European Union. Style guides therefore present a way for the standardization of texts.

A style guide may contain instructions on when to use which descriptor, how to inflect certain terms, how to translate different parts of the text (buttons, achievements, rewards), how to edit lists and sub-lists, how to handle punctuation, etc. In addition, some style guides also include the most common grammatical errors for a language and clarify the written use of a language. At the same time, style guides also determine the style (or tone) of the translation.

In addition, either the style guide or a separate document should contain information on the underlying context. This may include information about the story, characters, and places where the digital game is set. Pictures of the characters are also of great help here, so that the localizer can visualize them, and give an indication of the relationships between the characters, which will help the localizer to establish, for example, familial or other relationships.

Conclusion

The paper discusses a few basic features that are regularly encountered while working on digital game localization from English to Slovak, namely variables, text fragmentation, blind translation, teamwork, CAT tools, testing, character limits, and updates. It tries to explain them briefly and gives practical examples of them.

While a skilled localizer should be able to work around several of these features, the degree of their success depends on their competence level. A localizer's language competence determines how well they will be able to deal with variables or character limits. Their technical competence establishes how well they are able to deal with various CAT tools and other software used in localization processes. Having good data-mining competence helps the localizer find additional context or terminology online or in other sources. Localization requires a complex set of competences, and a well-trained localizer should have these competences at a good level or at least should be able to work on them. In this sense a skilled localizer is key to successful digital game localization.

Although some of these problems (e.g., variables, character limits) mostly have their root causes in language specific issues, the others are closely tied to a lack of context. Therefore, the article concludes with a recommendation – if developers are looking for high quality localizations of their digital games, they should aim to provide as much context to their localizers as is possible, and they should be able and willing to respond to their questions, because even a skilled localizer with sufficient training cannot work without the necessary context.

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Application of Roger Caillois' Typology in the Strategy Game Genre: A Case Study of Sudden Strike 4

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ABSTRACT:

The presented study closely explains R. Caillois' theory of game principles, while attempting to point out its apparent application in the digital dimension. It is our main intention to clarify the significance and topicality of the characteristics of individual game categories within media products – digital games. Thus, confrontation between the fundamental theoretical framework and its consequent practical application within the selected case study occurs in the submitted scientific text. The study's ambition is to identify the indicative characteristics of R. Caillois' game categories in the selected media product – the digital game Sudden Strike 4. The chosen research material can be qualified as a suitable representative of the strategy game genre, which was the direct determinant of our selection. Therefore, the primary objective of the study is to ascertain the possible application of R. Caillois' game theory in the strategy game genre. For the purposes of achieving the defined objective, the author uses methods of logical analysis of text in combination with qualitative content (narrative) analysis. She thus presumes a certain increase and revaluation of the existing scientific knowledge necessary for both the theory and practice.

KEY WORDS:

digital game, game principles, genres, strategy, Sudden Strike 4, virtual reality.

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Introduction

The extensiveness of game studies, or the issue of play is obvious, as play has been an integral part of human culture since time immemorial, while, due to technical-technological development, it has naturally been transformed into media reality in the form of the so-called *digital game*. The era of technological progress and related digitalization has become an impulse that has led society to implement new trends in various areas, games not excluded.

However, seeing *play* as a historical, cultural-anthropological, sociological or psychological phenomenon evokes a wide spectrum of questions, regardless of the reality (socio-cultural versus media) in which the discussed phenomenon takes place. In this respect, one of the markedly debated topics is the issue of game principles that can be considered the basic fundamental on which this so-called 'pastime' is based. French sociologist R. Caillois established a typology of game categories present in games of sociocultural (everyday) reality. Contemporary digital games theoreticians very often refer to R. Caillois' categorial apparatus, even despite the obviously different nature of digital games. Placing R. Caillois' game principles into contemporary discourse of digital games theory has become a relevant prerequisite for easier orientation in the selected problem and, at the same time, an adequate platform for the realization of a case study. The study consists of the verification of the analysed theory within the digital product classified in the strategy game genre.

It turns out that a lot of current scientific studies based on the theory of digital games in many ways only implement knowledge established in the last century instead of critically developing it. This fact has confirmed our conviction that it is necessary to constantly

practically verify and objectively reassess older game theories, concretely the frequently cited typology of game principles by R. Caillois. The paper directly follows up and expands the study focused on the action game genre in this context.¹ The article thus once more reacts to the questions related to the application of R. Caillois' categorial apparatus in the dimension of modern digital games.

Our fundamental aspiration is to specify the presented theoretical concepts through an example of a strategic digital game *Sudden Strike 4*. The author attempts to reach the aforementioned objective by using qualitative content (narrative) analysis in the form of a case study (specifically an instrumental case study²). However, considering the dynamics of digital environment development, it is necessary to continually analyse the examined issue and to draw conclusions that are as topical as possible.

Definitions of Basic Terms and Significant Theories Related to the Issue of Game Principles Categorization

Reality can be described as an ungraspable present existence of events and phenomena.³ Everyday reality is experienced in an awake state and represents something natural, self-evident, immediate, and objectified.⁴ It does not only consist of physical objects, actions or the actual circumstances brought by life. It is also created by living individuals.⁵ In this case, it is referred to as social, or sociocultural, reality that, according to S. Sandri encompasses the human aspects of the world and is constituted by tenets, principles and opinions that can inspire the behaviour of an individual and a whole community. The author also thinks that the way to define social reality more trivially would be to determine everything that does not belong to its realm, though coming from the natural reality.⁶ According to T. S. Eberle, the logic of the social construction of reality is simple. Society is based on a dual system of an 'objective' and a 'subjective' reality. The objective reality, although often produced by social action, appears to be a construct independent of society. Subjective reality is created through pervasive processes of socialization sustained and modified in daily interactions.⁷ Play itself is a typical representative of correlation between the subjective and objective realities; however, at the moment of its contact with an individual it becomes a stable component of subjective reality, as play represents one of the most common socio-cultural activities that has accompanied an individual's life in society for centuries.

1 For more information, see: BUČKOVÁ, Z.: Typology of Game Principles in Digital Games: A Case Study of Mafia III. In *Acta Ludologica*, 2019, Vol. 2, No. 1, p. 42-54.

2 HENDL, J.: *Kvalitativní výzkum. Základní metody a aplikace*. Prague : Portál, 2005, p. 107.

3 OBORNÍK, P.: Komunikačný model nových médií. In MERTOŮVÁ, N. (ed.): *Hľadanie ekvivalentnosti VIII*. Prešov : University of Prešov, 2015, p. 249.

4 BERGER, P., LUCKMANN, T.: *The Social Construction of Reality*. London : Penguin Books Ltd, 2006, p. 27.

5 VÁCLAVÍK, D.: *Sociologie nových náboženských hnutí*. Brno : Masarykova univerzita, 2007, p. 16.

6 SANDRI, S.: *Reflexivity in Economics an Experimental Examination on the Self-Referentiality of Economic Theories*. Heidelberg : Physica-Verlag Heidelberg, 2009, p. 32.

7 EBERLE, T. S.: A New Paradigm for the Sociology of Knowledge: "The Social Construction of Reality" After 25 Years. In *Schweizerische Zeitschrift für Soziologie*, 1992, Vol. 18, No. 2, p. 493-494.

Several theoreticians have attempted to define it, while considering it from different angles, as a cultural, social, psychological, and later media phenomenon. E. Fink describes play as an existential and ontological analogy, its purpose being itself, attached to the present moment and, at the same time, drawing the player's thoughts into the future world. According to him, play becomes a so-called aesthetic experience in a form of five fundamental elements that constitute its inner structure. He presents the elementary aspects as: the pleasure derived from the plot of play, the sense of play, the world of play providing the play with a form of openness and social existence, rules of play that somewhat limit player's free actions, and, finally, the instrument of play that allows the player to conduct it. In general, he describes play as an activity characterized by nonreality, inconspicuousness, while being a source of relaxation for the player, exciting their interest and deepening their imagination.⁸ E. Fink's ideas have been further expanded by sociocultural anthropologist J. Huizinga. He is of an opinion that play is older than culture and had thus existed before individuals even learned its rules, which is proved also by the presence of its forms in the animal kingdom. Therefore, play is, in a way, a fundamental expression of interaction between two living entities. The abovementioned author, however, primarily focuses his attention on a higher form of play that manifests itself in an interplay between several humans and he classifies it as a voluntary activity that proceeds within its own boundaries of time and space, following freely accepted but absolutely binding rules, having its aim in itself, and accompanied by feelings of tension, joy, and the consciousness of being that is different from ordinary life.⁹ Thus, it is a collective social reaction to the main drive of any culture; or it is an extension of social man.¹⁰ In summary, the phenomenon of play can be regarded as an occurrence that mostly causes pleasure, either as a way to acquire new information or in the form of saturation of an entertainment need.¹¹

Essential within the context of our focus of interest is the game theory of French sociologist R. Caillois, which is based on theoretical axioms of J. Huizinga. R. Caillois generalized the term 'play' as free activity that cannot be forced on the player, otherwise play cannot be considered attractive entertainment. According to him, play stands outside ordinary life and proceeds within proper boundaries of time and space. It is an uncertain activity: its course and outcome unpredictable, therefore it is an activity built on the player's initiative. His negative approach to play stems from understanding its unproductiveness, i.e., not creating value or wealth. Play is conducted on the basis of a principle of subordination to certain rules, which, for the duration of the game, replace the laws of ordinary life, the new, game rules being the only ones that apply. Finally, it is fictitious, i.e., representing alternate reality and illusions. The significance of the author's ideas is also confirmed by his description of player behaviour during the game. On the one hand, there are players characterized by an element of exuberance, free improvisation and carefree gaiety. It manifests an 'uncontrolled' fantasy, and he calls it *paidia*.¹² At the opposite extreme are users in who the exuberance disappears, and complementary tendency prevails; the game imposes on the players more conventions they should comply with. Their motivation to play is based on overcoming obstacles and they are characterized by effort, patience, skill, and ingenuity. He calls this disposition *ludus*.¹³ However, in this context, S. M. Grimes,

8 FINK, E.: *Oáza štěstí*. Prague : Mladá fronta, 1992, p. 16-31.

9 HUIZINGA, J.: *Homo ludens, o původu kultury ve hře*. Prague : Mladá fronta, 1971, p. 9-33.

10 McLUHAN, M.: *Understanding media*. Cambridge, MA, London : MIT Press, 1994, p. 255.

11 KREJČÍŘOVÁ, D., LANGMEIER, J.: *Vývojová psychologie 2*. Prague : Grada, 2006, p. 102.

12 Although quoting R. Caillois, G. Frasca uses the term 'paidea'. See: FRASCA, G.: *Ludology: From Representation to Simulation*. In SULLIVAN, K. (ed.): *SIGGRAPH '02: Proceedings of the 29th International Conference on Computer Graphics and Interactive Techniques. Electronic Art and Animation Catalog*. New York, NY : ACM, 2002, p. 135.

13 CAILLOIS, R.: *Hry a lidé. Masky a závrať*. Prague : Nakladatelství studia Ypsilon, 1998, p. 31-34.

A. Feenberg, and J. Juul add that it is necessary to distinguish not only between the phase of *ludus* (game activity allowed by formal procedures) and *paidia* (unstructured playfulness), but also between play (i.e., the act of playing) and game (i.e., the formal rules constituting play).¹⁴ For R. Caillois, the aforementioned formal rules also became the key theory in game research, specifically in the form of classification of game principles, which we consider cardinal also within our research.

Agon, alea, mimicry, andilinx (or vertigo)¹⁵ denote the basic axis of game principles representing the content and meaning of a game, although we should also allow for the possibility of their syncretism. The main pillar of the game category agon is competition, or a contest, ending with either victory or loss for an individual or a group. In agonal games, behind rivalry, it is possible to observe how, in an 'unreal world of play' based on fictitious terms, the player's desire to stand out in an attempt to achieve the social status of a winner manifests itself.¹⁶ At the same time, as stated by J. Dovey and H. Kennedy, a player's victory or loss in a game based on the game principle of agon depends on the individual's qualities, such as sufficient training, adequate concentration of the player or the will and resolve to win while using one's abilities.¹⁷ The game principle agon especially manifests itself in sports contests between two individuals (boxing, tennis) or teams (football, hockey, etc.). There can also be varying number of contestants competing for victory (courses, golf, etc.). Games, in which the contestants divide the game elements into identical parts are also classified as agonal games. Here, the game elements serve as a personification of the players themselves (e.g., chess or checkers pieces). R. Caillois particularly emphasizes the fact that agon is not only evident in contests between individuals but also between trained animals. Despite the aforementioned, the fight of an animal type must also comply with the rules set by humans.¹⁸ Using 'competition' in games can, however, also be seen in so-called educational games originating in the school system. These are usually competitions testing players' speed, accuracy, and knowledge, as well as creative abilities, logical reasoning, or ingenuity. In this context, J. A. Komenský defines game not only as an exercise of body but mainly of soul, while the player is rewarded either by profit or honour,¹⁹ although the French sociologist omits this type of agonal game.

However, he defines the principle of *alea*, which, as opposed to agon, negates endurance and will to win and presents chance, as *alea* is a game that, in comparison to the agile and initiative character of agon, symbolizes a principle of player's passive approach – it is not their interest to refine their abilities to achieve victory. The player in the *alea* game principle believes in luck, relies on chance and perceives their victory or loss as a verdict of fate.²⁰ They simply have no motivation to overcome an opponent; they just passively wait for what the situation brings.²¹ H. Pravdová adds that despite an obvious bipolarity between these two categories (agon versus alea), both game variants have something in common – the same game conditions and player's obligation to rules which influence the

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- 14 GRIMES, S. M., FEENBERG, A.: *Rationalizing Play: A Critical Theory of Digital Gaming*. In *The Information Society*, 2009, Vol. 25, No. 1, p. 109-110.; JUUL, J.: *Half Real. Video Games between Real Rules and Fictional Worlds*. Cambridge, MA : MIT Press, 2005, p. 12-13.
 - 15 For more information, see: BUČKOVÁ, Z.: *Typology of Game Principles in Digital Games: A Case Study of Mafia III*. In *Acta Ludologica*, 2019, Vol. 2, No. 1, p. 42-54.
 - 16 CAILLOIS, R.: *Hry a lidé. Maska a závrať*. Prague : Nakladatelství studia Ypsilon, 1998, p. 33-34.
 - 17 DOWEY, J., KENNEDY, J. H.: *Game Cultures : Computer Games as New Media*. Berkshire : Open University Press, 2006, p. 24.
 - 18 CAILLOIS, R.: *Hry a lidé. Maska a závrať*. Prague : Nakladatelství studia Ypsilon, 1998, p. 35-36.
 - 19 KOMENSKÝ, J. A.: *Nejnovější metoda jazyků*. Prague : Státní pedagogické nakladatelství, 1892, p. 359.
 - 20 PRAVDOVÁ, H.: *Sociokultúrne dimenzie hier v kybernetickom priestore*. In GÁLIK, S. et al.: *Kyberpriestor ako nová existenciálna dimenzia človeka*. Łódź : KSIĘŻY MŁYN Dom Wydawniczy Michał Koliński, 2014, p. 139-140.
 - 21 CAILLOIS, R.: *Hry a lidé. Maska a závrať*. Prague : Nakladatelství studia Ypsilon, 1998, p. 37-38.

game result and the player's performance.²² In this connection, V. I. Cassone provides a noteworthy opinion. According to him, there is no better combination of game variants than the one of *agon* and *alea*.²³ Roman gladiatorial games represent clear evidence of this game combination. On the one hand, the variant of *agon* prevailed in the form of struggle, violence, and competitive value of the contest. On the other hand, the contests between gladiators constituted a game for the people in the form of betting on the winner, which definitely declares the *alea* game principle.²⁴ However, the discussed game principle has similar features, such as game rules and identical game conditions, as the other game variants, for example also the principle of mimicry.

The rule of *mimicry* is based on accepting a fictitious environment, i.e., an illusion expressing a new shape of reality. It is a game variant, where the player as a subject occupies heterogeneous identities. Through these, they pretend to be someone else, hiding their own identity with a mask. The mimicry principle thus lies in the 'reincarnation' of the player as an illusionary character through which they play a specific role and based on which act in a certain way. The basic pillar of the presented game category is representation. Identification of the game subject with a fictitious identity constitutes their escape from common monotonous sociocultural reality.²⁵ The game environment is associated with a release of surplus energy; it is a place of exuberance, promotes sexuality and aggression, is linked with desire for exploration, imitates lives of others, is a means of socialization, and a tool for self-expression.²⁶ V. I. Cassone also takes into consideration the negative side of the analysed game principle, as it represents a whole scale of 'serious' activities (e.g., imitation of war, work, everyday activities, etc.), while applying them as a behaviour model through processes of illusion, analogy and imitation.²⁷ E. Gandolfi adds to the statement by interpreting the game variant in question as an activity directed towards symmetry, as it follows the ideals of scale, proportion, and synergy between individual objects in a game. Basically, it is aimed at a perfect match of the elements that eliminates anomalies.²⁸

As opposed to the previous three R. Caillois' game principles, the fourth – *ilinx* (*vertigo*) has a mainly complementary character, which means that it appears in games mostly in conjunction with other game variants. One of the main features of the game principle *ilinx/vertigo* is the freedom to accept or refuse a challenge, strict and fixed limits of the game and separation from reality. Often occurring in games of this type is a feeling of paralysis accompanied by illusion of movement by, e.g., rotation, rocking or dancing²⁹, or by other kinds of risky physical activity. Its purpose is to eliminate the stability of the game subject's perception and to cause confusion and panic in the human mind.³⁰ The essence of games causing vertigo exemplarily lies in confusion of the body and momentary disorientation of senses.³¹ Games based on the principle of *ilinx/vertigo* thus primarily cause

22 PRAVDŮVÁ, H.: Sociokultúrne dimenzie hier v kybernetickom priestore. In GÁLÍK, S. et al.: *Kyberpriestor ako nová existenciálna dimenzia človeka*. Łódź : KSIEŻY MŁYN Dom Wydawniczy Michał Koliński, 2014, p. 139-140.

23 CASSONE, V. I.: Mimicking Gamers: Understanding Gamification Through Roger Caillois. In *Games and Culture*, 2017, Vol. 12, No. 4, p. 355.

24 BROCK, T.: Roger Caillois and E-Sports: On the Problems of Treating Play as work. In *Games and Culture*, 2017, Vol. 12, No. 4, p. 325.

25 CAILLOIS, R.: *Hry a lidé. Maska a závrať*. Prague : Nakladatelství studia Ypsilon, 1998, p. 40-139.

26 SALEN, K., ZIMMERMAN, E.: *Rules of Play: Game Design Fundamentals*. London, Cambridge, MA : MIT Press, 2004, p. 309.

27 CASSONE, V. I.: Mimicking Gamers: Understanding Gamification Through Roger Caillois. In *Games and Culture*, 2017, Vol. 12, No. 4, p. 349.

28 GANDOLFI, E.: Beyond Diagonal Sciences: Applying Roger Caillois's Concepts of Symmetry and Dissymmetry to Journey. In *Games and Culture*, 2017, Vol. 12, No. 4, p. 365.

29 CAILLOIS, R.: *Hry a lidé. Maska a závrať*. Prague : Nakladatelství studia Ypsilon, 1998, p. 44-48.

30 HENRICKS, T. S.: Caillois's Man, Play, and Games. An Appreciation and Evaluation. In *American Journal of Play*, 2010, Vol. 3, No. 2, p. 169, 176.

31 CAILLOIS, R.: *Hry a lidé. Maska a závrať*. Prague : Nakladatelství studia Ypsilon, 1998, p. 48.

feelings of fear and danger and, secondarily, emotions of joy and curiosity or expectation. M. Consalvo explains the essence of expectation in the game approach as game asymmetry.³² The game dissymmetry of the variant in question should be understood in the sense of removal of reference parameters, or distortion of classic game elements between the player and game environment and elimination of interaction (in this game principle, objects are capable of actions that are often impossible in sociocultural reality; surrendering to vertigo rules out the possibility of the player having an impact on the game objects and vice versa).³³

The issue with topicality of R. Caillois' typology of game principles currently strongly resonates in academia, mainly due to the technical-technological development and the related emergence of a new form of reality – media, or virtual, reality, within which a new type of product – a digital game - has been established. R. Caillois has defined the categorial apparatus before virtual reality (as we know it today) existed. Based on the aforementioned, there has also been an emergence of certain assumptions about the possible application of R. Caillois' game principles in the dimension of digital games.

Virtual reality thus represents a kind of an imaginary world parallelly complementing the reality of everyday life. It is a fictitious, artificially created space of a digital shape that seeks the interaction of a human being with elements of virtual reality. It aims to induce in its user a feeling of illusion accompanied by its materialization in a simulated world, or the virtual environment.³⁴ Within it, the individual is simply fully immersed in something unreal, making this abstract world undistinguishable from the 'real' one.³⁵ Virtual reality as a three-dimensional representation of a non-real environment exists mainly due to computer-generated simulation.³⁶ For us to be able to ascribe the qualifier 'virtual' to this type of reality, it must meet certain characteristics, such as, for example, real time in which the display and interaction with the user take place; speed that makes the movement on the screen seem fluent; multidimensional environment with scenes and objects of mainly three-dimensional character or, at least, creating an illusion of it; interactive object that can be directly manipulated by the user; sound effects, etc.³⁷ This unreal reality is a tool that allows a person to do certain sensorimotor and cognitive activities in an artificially created digital world. This world can be imaginary, symbolic or a simulation of the real reality. The ambition of virtual reality is to distinctively achieve an interaction of a human being with the elements of the virtual world for the purposes of gaining knowledge or education³⁸ but mainly entertainment. It is the evident correlation between virtual reality and entertainment that encourages us to look at the analysed issue through the prism of digital games.

Technical-technological development, especially modern tendencies and innovations, particularly in the media area, has determined the transition of sociocultural past-time into the digital dimension. Digital (computer or electronic) game can be described as a product of an audiovisual character or a specific software used by an individual or more players. The objective of a digital game is not only to entertain the user but also to expand their cognitive and usually also their manual skills, which is contributed to by the inner variability of a game, or the increasing tendency of the game pace that stimulates

32 CONSALVO, M.: *Cheating: Gaining Advantage in Videogames*. Cambridge, MA : MIT Press, 2007, p. 176.

33 GANDOLFI, E.: Beyond Diagonal Sciences: Applying Roger Caillois' Concepts of Symmetry and Dissymmetry to Journey. In *Games and Culture*, 2017, Vol. 12, No. 4, p. 370-374.

34 ŽÁRA, J. et al.: *Moderní počítačová grafika*. Brno : Computer Press, 2004, p. 523-524.

35 RONCHI, A. M.: *e-Culture: Cultural Content in the Digital Age*. New York, NY : Springer Science & Business Media, 2009, p. 119.

36 XING TANG, X.: *Virtual reality – Human Computer Interaction*. Rijeka : InTechPress, 2012, p. 3.

37 ŽÁRA, J. et al.: *Moderní počítačová grafika*. Brno : Computer Press, 2004, p. 523-524.

38 FUCHS, P., MOREAU, G., GUITTON, P.: *Virtual reality: concepts and technologies*. Boca Raton, FL : CRC Press, 2011, p. 5-9.

the player and makes them overcome higher and more difficult tasks.³⁹ Ch. Y. Chen also agrees with the aforementioned statement and supports the proposition of an active participation of a player and, therefore, also states that the fulfilment of the purpose of digital games is possible through interaction between a specific user, or several users, and a gaming device, such as a computer or mobile phone, with which the game participant interacts in a form of returned reaction.⁴⁰ However, closer understanding of a digital game is dependent on the specification of basic principles that constitute the basis of videogame functioning. One of these is the audiovisual apparatus that allows a digital game to be played. N. Esposito states that in case of a digital game, a significant role is played by the environment with the background of which the game runs. He also affirms that a digital game is, foremost, a game running thanks to audiovisual apparatus but which is also formed by a concrete story as a possible alternative encouraging player's interactivity.⁴¹ Within this context, J. Juul adds that rules and goals, player's effort, and the actual projection of a player's actions into the game world are vital for a game.⁴² According to J. Jeník, a player's ability to choose in the course of game and the subsequent responsibility for the correct or incorrect decisions is also relevant.⁴³ In this connection, we cannot omit the extensiveness of the contemporary game market, in the sense of the quantity of digital products. It is due to the presence of a vast number of various forms of digital games that an imminent need for their classification has arisen. Nowadays, (digital) games can be segmented on the basis of their functionality, game mechanics or, relevantly for us, genres.

One of the Classic Game Genres: Strategy

Typologies of game genres vary. J. Newman recognizes mainly action and adventure games; driving and racing games; so-called first-person shooter games; platform and puzzle games; roleplaying games; strategy games; simulations, and sports.⁴⁴ By contrast, L. D. Grace reduces classification of game genres into action games, adventure games, puzzle games, role playing games, simulation and strategy games.⁴⁵ In his study, T. H. Apperley recognizes only action games, strategies, simulations, and role playing games.⁴⁶ However, regarded as the geographically closest taxonomy of game genres could be the classification by J. Švelch who states that there are classic game genres, such as action games, adventure, RPG, sports games, strategic games, simulations,

39 ULVER, S.: Virtuální Bůh. In *Film a doba*, 1995, Vol. 41, No. 4, p. 185.

40 CHEN, Ch. Y.: Is the Video Game a Cultural Vehicle?. In *Games and Culture*, 2013, Vol. 8, No. 6, p. 412.

41 See also: ESPOSITO, N.: A Short and Simple Definition of What a Videogame Is. In *DiGRA '05 – Proceedings of the 2005 DiGRA International Conference: Changing Views: Worlds in Play*. Vancouver : DiGRA, 2005, p. 1-6. [online]. [2023-03-29]. Available at: <<http://www.utc.fr/~nesposit/publications/esposito2005definition.pdf>>.

42 JUUL, J.: The Game, the Player, the World : Looking for a Heart of Gameness. In COPIER, M., REASSONS, J. (eds.): *Level Up: Digital Game Research Conference Proceedings*. Utrecht : Utrecht University, 2003. [online]. [2023-03-29]. Available at: <<https://www.jesperjuul.net/text/gameplayerworld/>>.

43 JENÍK, L.: Niektoré perspektívy a výzvy filozofického skúmania fikcie. In *Studia Aloisiana*, 2013, Vol. 4, No. 2, p. 15.

44 NEWMAN, J.: *Videogames*. London : Routledge, 2013, p. 11-12.

45 GRACE, L. D.: *Game Type and Game Genre*. 2005. [online]. [2023-03-29]. Available at: <https://www.researchgate.net/publication/262250061_Game_Type_and_Game_Genre>.

46 APPERLEY, T. H.: Genre and game studies: Toward a critical approach to video game genres. In *Simulation & Gaming*, 2006, Vol. 37, No. 1, p. 9-19. [online]. [2023-03-29]. Available at: <https://www.academia.edu/385966/Genre_and_Game_Studies_Toward_a_Critical_Approach_to_Video_Game_Genres>.

puzzles, but also adaptations of board games, and new game genres stemming from the classics as a result of mutual overlapping.⁴⁷ Even researchers that address games on a long-term basis often find the genre classification of digital games difficult. This is probably due to their newness and the great complexity of game mechanisms and production methods, historical and social reasons, as well as the connectedness to the dynamics of technological development.⁴⁸ The presented digital genre typologies do, however, coincide in many aspects, while all agree on a stable genre type 'strategy' which is the centre of our interest. The primary ambition and effort of the author is to ascertain the possible application of R. Caillois' game theory to the aforementioned game genre, simultaneously attempting its apt description.

Strategy games are one of the basic genres defined by the theory of digital games. These games require players' logical thinking and are characterized by their strategic decisions and interventions. The goal of a strategy game is to eliminate one or several adversaries by using unique tactics – the user works with an 'invisible hand' that they use to influence actions and the overall destiny of the characters appearing on the playing field. We recognize *real-time strategy* (RTS) that is considered more complex in the sense of the free choice of the player; the user implements their decisions almost immediately during the battle. This type of strategy is constituted on a system of there being a certain raw material, building or unit that allows the player to create their own base, train their own units, and thus to become ready for a strategic battle against their 'rival'. Another subgenre of this category of games is the *turn-based strategy* (TBS). Here, the participating players take turns. The user always reacts to actions of their competitor, i.e., they cannot act until their opponent finishes their turn. It could be said that TBS games are largely built on fate and luck. The only hope for the user is favourable chance and risk is definitely an essential element in this subgenre. In games built on turn-based strategy, it is important to balance risk and profit. In TBS games everything matters, the smallest detail, the slightest hint could mean a cue or a warning. In this subcategory of games, the clarity of boundaries depends on distinguishing the set rules. TBS games are often based on a principle of so-called random number generator (RNG), where the player's proceedings are fully dependent on randomness generated by computers. In practice we also encounter *building strategies*. This subgenre, however, often gets confused with RTS games but, unlike these, it is of a less warlike character. At the forefront of building strategies is the principle based on building and growth of the created or assigned game area. The objective of the user is to increase the prosperity and living standards of such construed game environment.⁴⁹ The strategy game genre, based on its stable presence on the media market, could be described as sought-after and continually produced, which justifies its place in the classic game genre classification. This fact has determined the selection of our research material that has become a subject of clarifying the presence of R. Caillois' game principles in the digital games dimension. Despite an obvious generalization of the obtained findings, it is the author's intention to expand the current body of knowledge related to the issue of game principles that has been primarily defined for sociocultural reality.

47 ŠVELCH, J.: Počítačové hry jako nová media. In *Mediální studia*, 2008, Vol. 3, No. 1, p. 16.

48 BUČEK, S.: Typologie hier nezaložené na herných mechanikách. In *Mediální studia*, 2013, Vol. 6, No. 3, p. 323.

49 For example, see: BUČKOVÁ, Z., RUSŇÁKOVÁ, L.: The issue of game genre typology in the Slovak online game-magazine Sector. In PETRANOVÁ, D., MATÚŠ, J., MENDELOVÁ, D. (eds.): *Marketing Identity: Brands we love – part 1*. Trnava : FMK UCM in Trnava, 2016, p. 280-294.

Case Study: Sudden Strike 4

Within the case study, it is our aim to identify in the digital dimension the essence of R. Caillois' game variants, while the selected research material is represented by the digital game *Sudden Strike 4*⁵⁰ as one of the relatively current representatives of the strategy game genre. The selection of the aforementioned game is, similarly to our formerly published and thematically related scientific study,⁵¹ intentional. In this case, we have mainly considered the fact that it is one of the most topical representatives of the game subgenre RTS, i.e., real-time strategy game. This fact underlines the possibility of future scientific use of research data in connection with analysing game principles in digital games of this type. Another important indicator that has, to some extent, influenced the subjective selection of the research material, is the production company Kalypso Media, having its creative base in Germany and handling the production and distribution of the selected digital product. The established results are thus related explicitly to digital games that are a result of work of game companies residing in Europe. The newest, fourth version of the strategy wargame *Sudden Strike* is set in the World War II period and simulates the real course of this world conflict (e.g., the Battle of Stalingrad, Operation Barbarossa, etc.). Through game avatars – military generals – the player has a unique ability to tactically control indefinite numbers of combat units, accumulate resources, build bases and 'conquer territories'. However, the research material has not been determined solely for the genre categorization of the digital game, residence of the production company, or relative novelty of the game product. We consider the digital game *Sudden Strike 4* interesting mainly because of the presence of game narrative (images of sociocultural reality or, more exactly, scenes from the Second World War), which is more often an exception, not a rule in the strategy game genre.

Therefore, our research material is the digital game *Sudden Strike 4*, which represents the current form of the strategy game genre. By using qualitative (narrative) analysis, we have again attempted to clarify different ways of applying individual game principles (*agon*, *alea*, *mimicry*, *ilinx/vertigo*) defined by R. Caillois. Through closer description of game narrative of the selected strategy game *Sudden Strike 4*, we have been able to explain the presence of a perceptible number of characteristic features of the discussed game rules.

Based on the obtained data, we can unequivocally state that the chosen research material contains the lowest variability of representations of the analysed game variants. However, similarly to the analysis of the game *Mafia III*⁵²⁵³, the most visibly employed *game principle* here is *agon* and its heterogeneous forms. As it is a game rule requiring a contest of at least two entities, in the analysed digital game it demonstrates itself mainly as a fight of the leading protagonist (soldier) against one human being (enemy) or a group of human beings (enemies), using weapons (e.g., grenades, handguns), or as a struggle between the main characters (soldiers) and one human being (enemy) or a group of humans (enemies) using weapons (e.g., guns, armoured vehicles, military aircraft, etc.). It is mostly a contest between individuals, enemy collectives or some combination thereof. Although the mentioned digital game lacks any verbal dispute between the protagonists, the significant

50 KITE GAMES: *Sudden Strike 4 (PlayStation version)*. [digital game]. Worms : Kalypso Media, 2017.

51 For more information, see: BUČKOVÁ, Z.: Typology of Game Principles in Digital Games: A Case Study of *Mafia III*. In *Acta Ludologica*, 2019, Vol. 2, No. 1, p. 42-54.

52 HANGAR 13: *Mafia III. (PlayStation version)*. [digital game]. Brno : 2K Games, 2016.

53 See: BUČKOVÁ, Z.: Typology of Game Principles in Digital Games: A Case Study of *Mafia III*. In *Acta Ludologica*, 2019, Vol. 2, No. 1, p. 42-54.

factor (in comparison to the analysis of Mafia III) is the space where individual fights take place (vehicle, industrial plant, airport, riverbank, railway station, bridge, radar station, military station, supply base, training centre, castle, etc.). It is the place of the struggle that is the essential determinant creating the narrative of the digital game Sudden Strike 4, where the main protagonists' goal is to seize parts of the territories and conquer a certain military area. The depiction of the agonal principle in the game is also expressed in a form of 'comparing the strength' of the main protagonist or main protagonists with inanimate objects (bunkers, buildings, vehicles, weapons, forts, etc.) by using weapons (gun, grenade, cannon, armoured vehicle, etc.). However, one of the most significant aspects of the agonal game principle is victory. In the story of the selected strategy game, it occurs in moments when the main characters obtain physical items (vehicles, weapons, buildings, etc.) by beating their opponent in physical combat. Furthermore, application of the game variant *agon* is not key only for the main story line of the game, but also for its meta-level. The agonal character of the meta-narrative framework of the game occurs in situations in which the player gains a person or an object needed to proceed in the game story or to complete individual missions, i.e., when 'the player beats the game'.

The game variant *alea* is the least significantly represented principle in the strategy game genre, or its digital representative, and its occurrences are not notably any different than in the previous case.⁵⁴ Not only are the main protagonists in no contact with any game of chance, but they also gain no financial reward from partial contests. The principle of an *alea* game with a typical feature of risk thus appears only in cases when the main character or characters achieve material advantage (mostly objects such as vehicles, weapons, etc.) as a consequence of risking their lives in a physical battle; the main character/characters gain nonmaterial advantage (usually new soldiers – allies) following a risk – most often when gambling their lives or in moments when the main protagonist/protagonists complete a task assigned by another person (commander) for material reward (a person, object, etc.).

However, a unique discovery is the multiple appearance of the various manifestations of the *game principle of mimicry* based mostly on a representation of a different, in this case virtual, identity. It also occurs as a new understanding of the unreal 'self' in the form of so-called collective identity. Within the physical part of collective identity of an army which the player stands for, the main protagonists are capable of walking, running, crawling, and climbing different places (e.g., observation towers); drive several different types of vehicles (armoured vehicles, military vehicles, etc.); ride a ship; fuel and repair vehicles and replenish ammunition for the army; treat injured soldiers; take available objects (e.g. ammunition, cannons, their own or enemy's vehicles, etc.), and manipulate them; fight in a standing and lying position and shoot from a bunker, trench or a building; build a pontoon bridge; search areas and find needed objects or soldiers; fire a warning flare; place and detonate explosives and anti-tank mines in an area or operate transmitting equipment used for communication. Contrary to the considerably sophisticated physical identity of the characters, the psychological identity of the game avatars is only elementary. There are specific cases where the mimicry principle is presented in the form of dialogues, where the main character (commander) conducts a conversation with their friends (soldiers) or the main character (soldier) conducts a conversation with their friend (commander), or the main protagonists (soldiers) communicate with each other. In none of these cases is the player able to influence statements of the character. A unique expression of the mimicry variant is the depiction of monologue speeches occurring when

54 See: BUČKOVÁ, Z.: Typology of Game Principles in Digital Games: A Case Study of Mafia III. In *Acta Ludologica*, 2019, Vol. 2, No. 1, p. 42-54.

the main character (commander) explains the detailed battle tactics to their army (which does not reply). A specific attribute of the mimicry game principle in the selected digital game is the use of help (reinforcements) from the main characters of the story or taking over conquered sites by the main protagonists entering surrounding buildings. We also cannot omit the most typical feature of the game rule of mimicry characteristic for almost all digital games, that is the player's representation of the game avatar or avatars.

For us to be able to analyse and closely observe the narrative structure of a strategy digital game, it must possess the character of a strategy wargame. From the name of the subgenre, we are already able to predict a certain occurrence of the *game variant ilinx/vertigo* encompassing feelings of fear, tension or adrenaline experience that often manifest themselves alongside physical battle. In this specific game, such emotions are aroused mainly in situations when the main protagonist or main protagonists risk their lives in combat with one human enemy or a group of human enemies, eventually when they conduct other life-threatening acts (e.g., climb observation towers, sprint in different terrain – in the moment of shooting, etc.). Similarly, we speak of the presence of the principle *ilinx/vertigo* in situations when the main characters hide from the enemy (when they know that they have lost the battle). The growing immersion of the player in the game story is also enhanced by circumstances when the main characters drive vehicles dangerously (slam into objects, drive at high speed, etc.), watch the enemy from observation towers or surrounding buildings, or conduct an escape from the enemy to a safe area (driving or running). The *ilinx/vertigo* game principle can in some digital games manifest itself as a combination of feelings of fear and happiness stemming from certain game situations. In the analysed material, these are specifically instances when the main characters attempt to save the lives of an imprisoned group of allied soldiers; want to prevent material damage (save convoys passing dangerous territory, etc.); are about to protect their own territory from attacking enemies or shoot a warning flare and wait for reinforcements from their own army. At first glance, the described eventualities represent only feelings of fear; however, after overcoming them or successfully protecting territory or saving lives, etc., the player experiences feelings of happiness. In the discussed digital game, there are also two situations when the player experiences feelings of fear and happiness simultaneously. These are moments when the main characters are destroying objects/eliminating people around them (shooting up vehicles, buildings, weapons; setting a vehicle/building with a garrison inside on fire, etc.) with their weapons or when they are walking in dark places – woods, factories, etc., often being attacked by various enemies.

To conclude the interpretation of obtained data stemming from qualitative content (narrative) analysis, we state that R. Caillois' categorization of game principles is of a timeless character, as it is possible in yet another research material (in this particular case belonging to the strategy game genre) to identify all forms and manifestations of Caillois' game variants. Although the obtained results are fairly generalized, they are applicable to the selected genre type that has its stable place on the mainstream game market.

Conclusion

Play represents one of the most important aspects of life in society since ancient history. However, significant theoreticians representing heterogeneous fields of regard consider play activities as a vital part of, for example, cultural and social events or daily life. This phenomenon has transformed itself almost in an unchanged way to an extremely different reality – virtual reality (and any kind of game activity that takes place there).

This novel game activity is defined by the term “digital game”, which allows individuals to operate in a fictitious world and is, similarly to a game taking place in sociocultural reality, based on certain principles, while its player is led to respect predefined rules. The apparent extensiveness of the game topic has led us to reduce the research problem, namely, to ascertain the topicality of categorial apparatus of R. Caillois, specifically its validity for the dimension of digital games.

Currently, an existence of a considerable number of digital products on the media game market can be observed. These are distinguished not only by the usage of game mechanics or their functionality, but mainly, and most significantly to us, their genre classification. From the point of view of realizing new trends in the game industry, their overlap or hybridization frequently occur, thus leading to an emergence of digital works that cannot be precisely classified among the already existing genre types. These are so-called new genres. Despite this, we consider it necessary to add that these would not have been created if the classic genre typology was not present. This typology comprises several basic game genres, besides action games, RPG, simulations and others, undoubtedly including strategy games.

Following the abovementioned statements, or the stable place of the strategy game genre, the author has purposefully selected her research material – the digital game *Sudden Strike 4*, in order to ascertain the presence of R. Caillois' game principles (agon, alea, mimicry,ilinx/vertigo) in its narrative structure. Thanks to knowledge obtained from previously published theoretical postulates and the consequent implementation of qualitative content (narrative) analysis, we have come to a conclusion regarding the evident use of the categorial apparatus of R. Caillois' game principles within current digital dimension.

As the core of the aforementioned genre type is not primarily the development of a story-line, but mainly the building of tactical thinking in the player, this has caused the low diversity of representations of the analysed game principles in the selected research material. The most represented game variants, similarly to the analysis of the digital game *Mafia III*,⁵⁵ were agon and mimicry and their various manifestations. The unique game rule – alea – appeared in the digital game *Sudden Strike 4* only in three forms and thus could be given a status of the least occurring game variant. The usage of the complementary game principle ilinx/vertigo in the analysed digital product is evident and more frequent than the alea game rule, but still not to the same extent as the game variants of agon and mimicry.

It was the author's ambition to not only present already existing academic knowledge, i.e., to provide the theoretical framework of the discussed issue but, predominantly, to ascertain the usage and apparent timelessness of the categorial apparatus of game principles by R. Caillois. Specifically, it was a survey of the defined phenomenon in the strategy game genre. Despite meeting the primary objective – to specify the presented theoretical concepts using the example of the strategy digital game *Sudden Strike 4* – we consider it necessary to continually analyse the issue of game principles application with an aim to acquire new or verify the previously ascertained findings.

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55 For example, see: BUČKOVÁ, Z.: Typology of Game Principles in Digital Games: A Case Study of *Mafia III*. In *Acta Ludologica*, 2019, Vol. 2, No. 1, p. 42-54.

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From Fossils to Pixels: Palaeontologists Playing and Streaming Digital Games

Interview with Jake ATTERBY
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Victor Monnin (V. M.): What are some of your first memories of digital games featuring references to palaeontology or the geological past?

Caitlin Syme: My first memory comes from playing *Microsoft Dinosaurs* (1993), which had a pretty scary – for a 7-year-old – stop-motion video called ‘The Hunt’ that has stuck in my memory ever since. I loved reading dinosaur encyclopaedias and playing digital games, so it was an obvious choice for my parents to buy me an educational dinosaur game. I loved it, and similar games such as Eyewitness Virtual Reality *Dinosaur Hunter* (1996). So, some of my earliest memories of dinosaurs and palaeontology in digital games were as educational experiences, but I did also enjoy playing other dinosaur games like *Dinotopia* (1996).

Jake Atterby: I can vividly remember as a kid going on the BBC website and playing some of the tie-in games for the *Walking with Dinosaurs* TV series. The one that I remember most fondly was based on a documentary called *The Ballad of Big Al*, which I loved watching as a kid. It was a documentary on an Allosaurus skeleton found in America covered in different injuries. We have a cast of it in our museum in Birmingham, and I love looking at it. The tie-in game is very simple, but because it’s so simple, a lot is left to your imagination while you go through the lifespan of this single Allosaurus. You start out as a juvenile chasing insects to a fully grown adult taking on herds of giant sauropods and eventually finding a mate. The original game is no longer available, as the website was abandoned over a decade ago. But someone remade the game from scratch, and it still holds up. That game is specifically designed to be educational. The only non-educational palaeo-game I remember playing as a kid is the tie-in game for the Disney *Dinosaur* movie. I have very vague memories of a Pterosaur character being stuck under a rock, and I could never figure out how to help it.

V. M.: Where did the idea of the *Palaeocast Gaming Network (PGN)* – a YouTube channel featuring palaeontologists playing digital games – come from?

Caitlin Syme: The idea came from Dave Marshall, who hosts *Palaeocast*, an influential palaeontology podcast. He saw it as a unique way to do science outreach, and given that I love gaming and palaeontology, I immediately put my hand up to take part! There are plenty of good games out there with bad science, and while I still want to play and enjoy them, I understand that what I’m seeing doesn’t reflect modern understanding of the ancient world. The idea of being able to play the games I’ve always played while also sharing what is correct and what is maybe not as correct was the main drawcard for me. And if you’re ever playing a palaeontology-themed game and wondering, just how accurate is this? Then we’re the channel you can come to!

Jake Atterby: I joined the *PGN* maybe a month or two after the difficult work of setting it all up had already been done. The main idea was to make a *Palaeocast* spin-off exclusively about digital games. A lot of people are interested in both digital games and palaeontology, and the amount of palaeontology-related digital games is massive. It represents a huge market that no one else had really covered.

V. M.: What are the most widespread misconceptions about the practice of palaeontology that we can encounter in digital games?

Jake Atterby: In a lot of games in which fossils are a resource, those fossils are usually sold for in-game currency. This is very common in *Animal Crossing* (2001-2020) but also in *No Man's Sky* (2016), *The Sims* (2000-2022), and *Stardew Valley* (2016). A lot of people seem to have this idea that palaeontologists go into the wild, find these priceless fossils, and sell them for millions of pounds. It's quite funny to see how in one of the recent *Jurassic World* movies, a real dinosaur sells for less money than actual dinosaur skeletons have sold recently. This is not what most palaeontologists do though, and my worry is that some of these digital games might normalize that exploitative approach to palaeontology. On the flip side, some of the work that palaeontologists do can be exploitative. Palaeontology is currently going through a much-needed ethical reckoning, and a lot of our practices in the field are being re-examined. One of those practices is known as "parachute science". It refers to palaeontologists usually from North America or Europe going to foreign countries to find fossils that they bring back to their universities and museums to study, most of the time without collaborating with local communities. Games usually portray this kind of practice as normal. In *Jurassic World Evolution* (2018), you can send out your fossil dig team to real world dig sites, but even sites in Mongolia or Brazil, countries where it's literally illegal to do that. Clearly, a lot of legal and ethical issues related to the practice of palaeontology have not yet reached the community of digital game designers.

Caitlin Syme: One other misconception is that palaeontologists in the past had no idea what they were looking at and made stupid assumptions, while nowadays we know *the* answer. But if this answer happens to change at all, then we must also be stupid!

V. M.: What are some of most pervasive tropes about the geological past and extinct animals that we see in digital games?

Caitlin Syme: Extinct animals are usually represented as if they were violent animals that constantly roared and screeched and fought each other! Luckily, modern documentaries, and now some digital games too, are showing dinosaurs and other extinct animals with more realistic and natural behaviours.

Jake Atterby: There is a common misconception that all the geological past consists of dinosaurs, and especially of T. rex, velociraptor, and triceratops, those classic children's book cover dinosaurs. There is a great diversity of extinct animals, but games rarely explore it. Even when some games do, the animals are labelled as "dinosaurs" anyway. In *ARK: Survival Evolved* (2015), the game shows a variety of early mammals and even fishes, but they are still called "dinosaurs". But I think the most common trope is that ancient animals are "monstrified": they are given long claws, sharper teeth, and their skin is tightly wrapped around their skeleton. This "monstrification" shifts extinct animals away from real animals into the realm of myth, and that's where the problem is. This is even more noticeable in digital games, where the creatures are interactable. This can contribute to disconnecting people from the past of our planet and therefore interfere with palaeontology's role in teaching people about climate change and extinction. Think of it this way: There is a game called *Second Extinction* (2020), where you fight off waves of oversized raptors. If they were replaced with a living animal, like lions for example, players would be asked to do unspeakable things to endangered animals. It's interesting how dinosaurs in digital games can be more easily replaced by zombies or robots than by living animals.

V. M.: The PGN is not a channel designed to critique digital games but rather to explore the potential of certain games to teach the public about palaeontology. Could you give some examples of games that show such potential?

Caitlin Syme: There are some standout games that intend to accurately portray ancient environments, such as *Saurian* (2017), or games that have accurate prehistoric animal models such as *Path of Titans* (2020), *Isles of Yore* (2022) and *The Isle* (2015). It's great to see more games emulating real animal behaviour and relying on accurate science to make their models. I was pleasantly surprised by *Dinosaur Fossil Hunter* (2022), in that it delves a little more into what palaeontology as a career is like, and the amount of time and energy that goes into preparing fossils. The most recent pleasant surprise came when playing *The Sinking City* (2019) and I found a quite realistic Spinosaurus skull – while the game didn't tell you anything about dinosaurs, or say that this was a dinosaur, it was still nice to see an accurate dinosaur skull in a digital game.

Jake Atterby: We try not to make PGN just a reaction channel. Instead, we use digital games as a virtual stage to talk about different topics related to palaeontology. One of the most detailed games we have ever tested is *Ancestors: The Humankind Odyssey* (2019). This game is interesting because it takes place in a very specific prehistoric period in Africa. In the video we did touch on the surprising accuracy of the creatures in the game, but we mostly delve into deeper themes, like how scientists first assumed that early humans were apex predators and how this conception has changed. Now, we believe that our ancestors were most certainly prey, which is really what that game is about. The most surprising game from an educational point of view was *The Elder Scrolls V: Skyrim* (2011). The video starts with the observation that there are mammoths and cave bears in the game, which led us to talk about how fossils may have inspired myths all over the world. For example, the hole in the middle of an elephant skull – where the trunk comes from – looks like an eye, and there is evidence that suggests that it inspired ancient myths about cyclopes. Then, we ended the video by talking about the game's dragon skeletons and how they can teach us about homology and the evolution of wings. Afterwards, the designers of the dragons found the video and got in touch with us! I like to think what we do on the PGN is transformative and not just reactionary.

V. M.: What do you hope an initiative like the PGN can achieve regarding the relationship between the paleontological community and the game design community?

Jake Atterby: I make a series of videos using *American Truck Simulator* (2016) to run virtual fieldtrips, and the developers love it! I have done live streams with them, where we have talked about the rocks and fossils that they have or could show in their scaled-down version of America. Before, the developers would use generic rock textures, but now they are so dedicated to capturing the environments more accurately. Besides that, we have also been chatting with the developer of an educational game called *Fossil Corner* (2021), where players can learn about phylogeny and how to organize fossils. I believe that this game would do wonders if installed in a museum for example. I have also made a series of videos using a modified copy of *Minecraft* (2011) which adds a lot of obscure extinct animals. I fully believe that using a digital game engine like this one, we could make a *Walking with Dinosaurs*-style documentary, where players could role-play as nature documentarians and observe prehistoric animals. This would be way cheaper than any similar documentaries ever done before.

Caitlin Syme: I hope that the *PGN* can help continue the conversation happening around digital games as an educational tool even when that's not the main goal of the game and help link up interested game developers with palaeontologists. I think it's also helpful for palaeontologists to remember that time constraints, strict budgets, artistic direction, or marketing strategies can influence the way ancient animals are portrayed in games, not just a lack of knowledge. But we love playing and promoting games that help people learn about palaeontology, so hopefully the market for these types of games can continue to grow.



SOUL HACKERS 2

ATLUS: *Soul Hackers 2* (PlayStation 5 version). [digital game]. Tokyo : Sega, 2022.

Miroslav Macák

Soul Hackers 2 is an oddity in today's gaming market. In an era, when long dormant series are rarely rebooted, let alone continued, *Soul Hackers 2* boldly continues where the original 1997 *Shin Megami Tensei: Devil Summoner: Soul Hackers*¹ thematically left off. Albeit the first instalment received a remake for Nintendo 3DS in 2012, it was not as popular as its parent series, *Shin Megami Tensei*, and was completely overshadowed by *Persona 5*², another SMT spin-off, a few years later. *Soul Hackers 2* also dropped the moniker of both *Devil Summoner* and *Shin Megami Tensei*, which has made the already niche game even less recognisable. Even though this sequel, purely through its namesake, distances itself from its own legacy, it still retains the core of the *Megami Tensei* franchise, as it blends together occult themes of demons, religions and mythologies with a futuristic setting. The first instalment focused on cyberspace and a vision of a fully digital city; however, after 25 years of digital communication, our awe and fear of technology typical for the age of Internet infancy are long gone. Thus, the new sequel chooses to address a different topic; artificial intelligence.

The story starts off with an advanced AI that has been overseeing humanity and senses a possible end of the world. It creates two tangible avatars of itself (one of which serves as the main protagonist) to interfere with the human world. They then proceed to resurrect key people who are supposed to help stop the apocalypse by "hacking their souls". The essential idea of saving the world and its over-the-top execution is quite standard for Japanese popular media, but it takes a few refreshing twists. One of the party members has all the characteristics of a typical *shonen*³ protagonist. He is an adolescent, grew up in an orphanage, has amnesia and his visual design includes short spiky hair and a coat with red accents (the red colour is often associated with the lead characters in Japanese media). Instead, the leading role is assumed by a less *cliché* female character. Ringo doubles not only as the player's avatar, but also as a narrative avatar of an advanced AI. Even though she is a pre-defined character, she does not have a set worldview and thus enables the player to reflect their mindset into Ringo. This character design also strongly supports the theme of the AI learning about the world, while the player learns about the lore of said fictional universe alongside her. Albeit she is a pre-made protagonist with very few ways for the player to control her behaviour, because of her initial obliviousness, she still manages to allow a higher level of embodiment, like any player-made character.

As expected from this series as a whole, the game's narrative is rich in religious references. Outside of the staple mythological and religious beings that serve as allies and

1 ATLUS: *Devil Summoner: Soul Hackers*. [digital game]. Tokyo : Atlus, 1997.

2 ATLUS: *Persona 5*. [digital game]. Tokyo : Atlus, 2016.

3 Remark by the author: *Shonen* is a term used to categorise Japanese popular media based on age and gender. The target audience of *shonen* products are teenaged boys and young adult males. Most common themes of *shonen* products are action and adventure; however, it often extends to mystery, sport or comedy. The actual audience often extends beyond the expected target group.

enemies, the narrative itself strongly refers to Christianity. That can be seen as soon as the main protagonists take physical forms and are given names; Ringo – an apple in Japanese, and Figue. Both types of fruit are often attributed to being the biblical forbidden fruit of knowledge. As they are disconnected from the main AI, they also lose most of their computing power, which leads to reducing their knowledge about the world to minimum. Later on, the player finds out that the main objective of the party is to collect Covenants, coloured beams of light which, if collected together, give their wielder the power necessary to end the world. This can allude to the story of Noah, in which, after the Flood ended, God showed that he would never end the world again by creating a rainbow. The biggest caveat is that Christianity does not work simply as a popularising element. The player must possess at least some degree of awareness about the matter, and thus a wider understanding of a topic that is not commonly required to enjoy a mainstream or popular fiction is required. The game does not provide any explanations about the motifs it offers and expects the player to decipher them. Some of these can easily be interpreted by anyone with a basic knowledge of Christianity, but someone with deeper understanding of theology could conduct a more enlightening analysis of the game. This is, however, in dissonance with the global audience that the game is attempting to target. The multicultural approach is obvious from the very beginning, as the names used for the important characters are English codenames and not standard Japanese names (e.g., Arrow, Milady, Iron Mask), even though the game takes place in futuristic Japan. The product strives to be easily approachable in terms of design, but also works with themes that are difficult to grasp.

The gameplay aspects of *Soul Hackers 2* are a standard turn-based JRPG fare. The player only gets four playable characters, but each of them can be equipped with their own 'demons' to personalise the playstyle of the party. The combat is similar to other Megami Tensei games, where every character has different elemental affinities and hitting their weakness rewards the player. In this case, the more weak points the party hits during their turn, the more powerful an attack they release at the end. While there are no inherent flaws to this mechanic, it feels less satisfying than launching an all-out attack for skilfully exploiting weaknesses of all the enemies in *Persona*, as well as less rewarding than getting extra turns in *Shin Megami Tensei*.

The world itself consists of a few enclosed areas. Some of them serve as a city hub, while others are there for the purposes of exploration and combat. While the general areas are fun to explore, the major game-design flaw can be found in the later parts of the 'Soul Matrix' dungeons. They serve as a way to explore the past of other party members and are mandatory for the 'true ending'. The deeper parts of the said dungeons contain portions with teleports that move the player around the area without any hint as to where they will end up. This trial-and-error design can be found in early 2000s JRPGs, but was not engaging even back then and can be considered outdated by modern standards.

The game has only two endings, which is standard for JRPGs, but the final story segment feels rushed. After defeating the main antagonist, the 'true final boss' is revealed and the only narratively impactful choice happens at the very end of the game after the fight. Everything that was required to unlock the true ending thus feels unnecessary from the narrative standpoint. The true ending does not leave anything to imagination and feels like a standard 'happy ending'. The 'bad ending' is much more open to interpretation as it shows how much Ringo would lose if she failed to achieve her personal objective. It is also much closer to the aforementioned Christian themes, as it implies banishment from paradise. Another aspect that leads to the feeling of the game being unfinished is that the number of covenants is just five instead of the expected seven. Even characters present within the game comment on the situation by saying "we just don't know why".

The most prominent problem of *Soul Hackers 2* is its own identity (or its lack thereof). When the original *Soul Hackers* came out, the *Megami Tensei* franchise was not as saturated as it is today, and the topic of cyberspace was a novel concept to explore. The sequel was developed in a very different environment. Post-humanistic topics such as AI and robots and their place in society are a common theme of many popular digital games, such as *Detroit: Become Human*⁴, *Nier Automata*⁵ or *Cyberpunk 2077*⁶ and *Soul Hackers 2* does not bring anything ground-breaking to this narrative genre. Outside of that, it is impossible to not compare *Soul Hackers 2* with *Persona 5* and *Shin Megami Tensei V*⁷. As all the games share the basic core, seeing them side by side underlines the identity problem associated with *Soul Hackers 2*. *Persona 5* immaculately portrays the social problems of our society and manages to flesh out a wide variety of characters, while *Shin Megami Tensei V* manages to create a bleak, hopeless world and stays open to interpretations with its more indirect narrative. It works with symbolism and metaphors and does not expect to be understood by everyone. *Persona 5* is so approachable that it has become mainstream. *Shin Megami Tensei V* is the exact opposite, but does not even try to look approachable and revels in its *niche* status. *Soul Hackers 2* seems to aim at the same audience as *Persona 5*, but the identical general consumer will not be able to understand all its unexplained references due to a lack of knowledge. Given its straightforward storytelling, it does not guide the player to search for information outside the game. The story attempts to combine the approaches applied by both its predecessors, but does not excel at either of them. *Soul Hackers 2*, while still a well-crafted JRPG that can satisfy fans of the *Megami Tensei* franchise, is rightfully overshadowed by its brethren. It may turn out to be a hidden gem in the future, but its potential to reach a wider audience or become a genre milestone is considerably limited by its own contradictory design choices.

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5 PLATINUMGAMES: *Nier: Automata*. [digital game]. Tokyo : Square Enix, 2017.
6 CD PROJEKT RED: *Cyberpunk 2077*. [digital game]. Warsaw : CD Projekt, 2020.
7 ATLUS: *Shin Megami Tensei V*. [digital game]. Tokyo : Sega, 2021.



HOGWARTS LEGACY

AVALANCHE SOFTWARE: *Hogwarts Legacy*. [digital game]. Burbank, CA : Warner Bros. Games, 2023.

Lucia Škripcová

Few digital games have been released with such expectations and at the same time with such fear of the audience as *Hogwarts Legacy*. The lovebrand of the wizarding world of Harry Potter, which even after so many years is fed by ever-increasing media production – from books to movies, from movies to another series of movies about events that happened only a few decades before Harry Potter came to Hogwarts and so on. And among that, of course, exist countless digital and tabletop games and much more. In short, this universe is a lovebrand that, like the giants of the film world, has a huge number of constantly active fans. It was therefore only a logical outcome that at some point an AAA digital game would be released, which would try to rekindle the interest not only of current hardcore fans, but especially to expand their ranks to include younger generations who have not experienced the biggest boom around the young wizard. While my generation (and probably yours) was the one that lined up in bookstores before a new book came out or went to midnight movies in cinemas, the current 15-25 generation did not experience that era. They jumped on the bandwagon, about halfway or towards the end of the original film series.

Hogwarts Legacy manages to do something that a game title rarely does – to attract those people to PCs and PlayStations whose most prominent gaming until now involved mobile games at best, and who until now were not interested in playing more complex titles. We can argue that an ordinary player would have encountered *Hogwarts Legacy* at some point and probably would have played the game whether or not they were a fan of the wizarding world universe. However, ‘forcing’ someone who does not consider themselves a gamer and does not play games is a tough nut to crack. However, this title manages to do just that. Of course, hardcore gamers could argue that there are countless titles that deserve more attention from someone new to AAA games, and it should be their favourite and award-winning game that should have this privilege, but a cultural and media phenomenon with an impact such as Harry Potter will hardly find competition in the segment of reaching new players, which is also proven by the increase in sales of game hardware in the month in which the game was released.¹

Even before the release of the game, the cancel culture indirectly earned a certain amount of media coverage for it, as they tried to cancel the game or at least minimize the number of people who will play it. The premise of this ‘activism’ was that by buying the game, players were supporting a transphobic ideology that wizarding world author J. K. Rowling more or less directly subscribed to via tweets and her blog. It is not up to me to evaluate how realistic the expectations of the cancel culture movement were, but the truth is that while they may have done it with good intentions, they chose an absolutely inappropriate way of doing it. They virtually attacked streamers who received a copy of

1 YADEN, J.: *Hogwarts Legacy Is Already The Best-Selling Game Of 2023 In The US*. Released on 29th March 2023. [online]. [2023-05-24]. Available at: <<https://www.gamespot.com/articles/hogwarts-legacy-is-already-the-best-selling-game-of-2023-in-the-us/1100-6512789/>>.

the game a few days before the official release and streamed it, joining their streams in groups, spoiling the end of the game, insulting the streamers, wishing them death and even threatening them. While some of the streamers managed these raids without problems, others decided to turn off the stream and not comment on the game anymore, and in some cases streamers even decided to end their careers altogether. To what extent these are adequate reactions or attention farming cannot be evaluated, but it is a fact that the streamers who made these decisions have not started creating new content even now, several months after these events, or have announced the end of their careers.² However, as it turned out, these cancel culture activities did not fall on fertile ground, as *Hogwarts Legacy* is one of the best-selling games of this year³, and is also in the running for the Game of the Year award, although the competition will undoubtedly be strong this year. By the way, the game as such is positioned inclusively to the theme of otherness in the socio-cultural context – the player meets characters who are transgender (Sirona Ryan – the first transgender character in the Harry Potter universe), who are openly homosexual (Nora Treadwell talks about her wife), are of different skin colours (Natsai Onai), and meets both extroverts and introverts (Amit Thakkar), etc. Of course, we could ask if it is enough in today's polarized world, especially in the context of the statements of the author of Harry Potter, and in view of these, some game portals have decided not to review *Hogwarts Legacy* or talk about the game, but from my personal point of view it is at least a small step towards a better and more inclusive world.

The gameplay itself takes place approximately 100 years before the events of the original Harry Potter series, so we will not meet any familiar characters in the game (which will surely save fans from potential disappointment). But what will bring an undoubted feeling of nostalgia are the places that we know – the stairs that change direction, the main dining room, some outdoor areas and surrounding buildings, flying on a broom and hippogriffs, etc. A large part of the player experience is about sentimentality and reminiscing about times long gone – while playing, you can't help remembering your own childhood and the magic of the original films. *Hogwarts Legacy* is an open world with a fairly large map and a lot of side quests that can keep the player busy for dozens of hours, as long as they try to complete the game to 100%. Of course, in the area of side quests, you cannot avoid repetitiveness and the occasional rage quit, when you cannot find the flying key you are looking for on the twentieth try. However, the main quest is attractively designed, unfolds briskly (with slight modifications depending on whether or not you decide to learn forbidden curses) and at the end two options for ending the main narrative (neither ending, however, gives the player any advantage or disadvantage for the next playing, which is unlocked after the end of the main story line) are provided. The mechanics and gameplay as such are not groundbreaking or innovative. We have seen them all before, ultimately it is a classic action RPG with adventure elements. On the other hand, if it also contained something innovative, it would maybe serve more harm than good. I am afraid that more complex mechanics could discourage new players and bring them more frustration than pleasure from playing.

Lastly, the success of *Hogwarts Legacy* is built on nostalgia and media *hype*. The Harry Potter series is a lovebrand whose outcome in the form of a game was not unexpected and the success of the game could also be predicted. The question arises as to

2 JIANG, S.: *Popular Vtuber Pikamee Retires Following Hogwarts Legacy Controversy*. Released on 2nd March 2023. [online]. [2023-05-24]. Available at: <<https://kotaku.com/pikamee-vtuber-hogwarts-legacy-stream-twitch-youtube-1850178628>>.

3 IVAN, T.: *Hogwarts Legacy has topped 15 million sales and grossed over \$1 billion*. Released on 5th May 2023. [online]. [2023-05-24]. Available at: <<https://www.videogameschronicle.com/news/hogwarts-legacy-has-topped-15-million-sales-and-grossed-over-1-billion/>>.

whether other titles that still have a strong fan base will choose this route. After the success of *Hogwarts Legacy*, this would be highly expected. It's also not surprising that after the success of the game, which manages to attract a huge number of people to keyboards and joysticks, the new Harry Potter series is planned for HBO Max, and *Hogwarts Legacy 2* is also rumoured, since the universe provides enough exploration to develop. You could say that *Hogwarts Legacy* was a kind of test (financially expensive, no doubt) of whether the fan base is still strong enough to make it worthwhile developing this universe further through other media products. And the answer is clear: Always.

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THE LAST OF US (TV SERIES)

MAZIN, G., DRUCKMANN, N. (Created by): *The Last of Us*. [VOD]. New York, NY : HBO Max, 2023.

Zdenko Mago

“At the end of the day, there are people out there that will never pick up the controller, and they will never experience the story. And I think our story is special enough to bring it to them”.¹

- Neil Druckmann

The critically acclaimed multi-award-winning digital game franchise, the titles of which belongs to the best-selling and generally the most successful games for a given platform in history, may seem like an ideal subject for a television adaptation but, at the same time, a considerable challenge to represent the story in a new format to a new audience to at least fulfil if not exceed the already high expectations. It is even more difficult with an awareness that every detail will be under the strict scrutiny of gamers and fans. The TV adaptation of the game series *Halo*² faced something similar in 2022.

The game *The Last of Us*³ from 2013 is one of the most popular and most recognized PlayStation games, so the TV adaptation process had to proceed very carefully and precisely. This was ensured by the production by Sony Pictures Television and PlayStation Productions and also by the engagement of several creators of the original game, especially its writer N. Druckmann and music composer G. Santaolalla. The approach to the adaptation had a clear philosophy: to faithfully preserve the original game story but to predominantly devote more space to the events that were not developed in the game, particularly those that concern the main characters but took place between chapters or the background stories of secondary characters. In this way, another human dimension was added, making the adaptation more dramatic and, in some scenes (e.g., a talk show with epidemiologists, a consultation of a strange case with a mycology professor), also disturbingly realistic. It thus brings an intensive experience to viewers non-familiar with the game and, at the same time, expands the original game story experience for loyal fans.

A significant benefit was that the DLC *Left Behind*⁴ for the first game, as well as the sequel *The Last of Us Part II*⁵ had already been released, so the TV series creators could already consider these games and even adapt some parts into the overall picture (or incorporate DLC into the main story immediately). This is the reason why in the series, we

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- 1 DENEHY, B., SONTAG, K. R. (Produced by): *Making of 'The Last of Us'*. [VOD]. New York, NY : HBO Max, 2023.
 - 2 BUNGIE et al.: *Halo (series)*. [digital game]. Redmond, WA : Microsoft Game Studios, Microsoft Studios, Xbox Game Studios, 2001-2021.; KILLEN, K., KANE, S. (Created by): *Halo*. [VOD]. New York, NY : Paramount+, 2022.
 - 3 NAUGHTY DOG: *The Last of Us*. [digital game]. San Mateo, CA : Sony Computer Entertainment, 2013.
 - 4 NAUGHTY DOG: *The Last of Us: Left Behind*. [digital game]. San Mateo, CA : Sony Computer Entertainment, 2014.
 - 5 NAUGHTY DOG: *The Last of Us Part II*. [digital game]. San Mateo, CA : Sony Interactive Entertainment, 2020.

were able, for example, to visit the city of Jackson, only seen in the distance in the game, and also to briefly get a first look at some characters like Dina, who will be more important in the future.

A certain sobriety was noticeable in terms of the genre treatment as well. While in digital games, genre hybridization is ordinary and often necessary to design an abundant interactive experience, in this regard, the TV adaptation was more fluent and straightforward. Individual episodes were more dedicated to the dominant genre, so the audience could absorb content more easily and maintain continuous immersion during the longer period of weekly episodic experiences. Basically, it is the same system of sequential construction as in digital games, but within the gameplay, it runs more smoothly due to the higher frequency. In summary, while the game was an intensive action adventure with survival horror elements, in the TV adaptation, only the action and horror sequences necessary to preserve the storyline were kept, so the genre gradually settled on a kind of road-movie drama. However, in combination with the approach 'beyond the cut of the game' and an almost unbelievable attention to game design details – from the main characters' wardrobes to the fictional movie posters and the appearance of the world destroyed by the infection – it actually worked.

In terms of the current trends in media production within which, among others, emphasis is placed on a balanced representation of gender and gender identity, races/ethnicities (several changes in casting contrary to the game were obvious in this regard), cultures, and sexual orientation, it was a certain advantage that the game *The Last of Us* has always been LGBTQIAP+ communities friendly, and not only because the main protagonist Ellie is one of the most famous homosexual digital game characters and one of the few such characters that are also playable.⁶ Unlike games like RPGs, in which the player often has an opportunity to choose their own sexual identity as well as the subject of their romantic interest (e.g., the *Mass Effect* series), in the case of *The Last of Us*, Ellie's sexual orientation is default by the game story. This issue could thus be further elaborated more naturally.

The TV adaptation further enhanced this aspect with the casting of Bella Ramsey, who identifies as nonbinary regarding her gender identity, into the role of Ellie and with two episodes focused on tragic queer love stories, which evoked conflicting opinions and reviews. Episode 3 depicted the fate of the secondary characters Bill and Frank, and significantly differed from the game (they did not romantically die together, in the game, Frank left Bill because he was refusing to leave Lincoln). Episode 7 becomes important for Ellie's character portrayal, depicting a flashback to her past and particularly to a key event in her personal (also game) past. It included not only the moment she was bitten, leading to the discovery of her immunity to the fungal infection and acquiring the undesirable position of humanity's possible saviour, but also the admission of her sexual orientation, both fundamental for the future character development.

The critics indicated that both episodes were narratively unnecessary and thus could be skipped without missing the point of the main plot.⁷ It perhaps might be partially understandable in Episode 3, basically created based only on a note from the game that the player did not have to even discover while playing the game, but as already mentioned, it was in line with the approach to this adaptation – to focus as much as possible

6 Remark by the author: In the first game, *The Last of Us*, Ellie is a playable character only in one part since Joel is the main protagonist but the only playable character in the game's DLC *Left Behind*. Subsequently, she is the main playable character in the sequel *The Last of Us Part II*.

7 JOHNSTON, D.: *The Last of Us Episode 7 Proves Episode 3's Worst Critics Are Wrong*. Released on 27th February 2023. [online]. [2023-05-18]. Available at: <<https://www.inverse.com/entertainment/last-of-us-episode-7-defense-of-flashbacks>>.

on events which were not directly developed in the game. Although it is worth considering whether the intentional intervention in the fate of Bill, which is contrary to the game's story, caused 'more harm than good', possibly setting a double-edged precedent for the next series. Regarding Episode 7, it adapted the quite extensive DLC for the first game, titled *Left Behind*, set within the main storyline and narrated events between original chapters, not as a spin-off. In addition, even though it was 'just' DLC, against strong competition it was able to win the category Story at the 11th British Academy Games Awards in 2015 (just like *The Last of Us* the year before), so some opinions about narrative irrelevance or emptiness are out of place here. Paradoxically, this episode achieved lower ratings on average than episode 3, so, in this case, non-fulfilment of the game fans' expectations from this part of the story had to play some role. For example, the emotional climax of DLC, when Ellie, with her eyes closed, was imagining playing a broken arcade game while her friend (and latent love interest so far) Riley was describing the gameplay to imagine, was missing in the TV episode.⁸

Overall, it seems that the TV adaptation of *The Last of Us* can maintain its renown for a long time and thus become a worthy alternative to the original interactive experience for viewers. Although it must be emphasized, so far, the series has only been based on the 'less problematic' first game and its DLC, so the real challenge for the TV series creators is still ahead. We will see how N. Druckmann and C. Mazin will deal with managing the second, more controversial part (already announced as being divided into two series) and eventually, as in the case of Bill, whether they will have enough courage to change its most criticized aspect,⁹ and thus perhaps even the entire fate of this adaptation.

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8 Remark by the author: The impact of mentioned media production trends was subsequently more prominently present in the game sequel.; For more information, see the review: MAGO, Z.: *The Last of Us Part II*. In *Acta Ludologica*, 2020, Vol. 3, No. 2, p. 87-88.

9 Ibidem.

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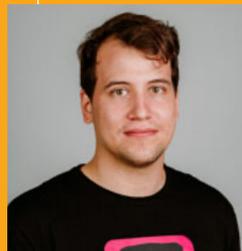
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Choosing the Right Tool: Board and Digital Games in Education

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Ing. Vajk Pomichal has operated at FMK UCM in Trnava as a full-time PhD student since 2021. He received his engineering degree in intelligent software systems at the Faculty of Informatics and Information Technologies at STU in Bratislava. His research focuses on developing critical thinking skills using educational games, especially in the context of fake news and hoaxes, which nowadays have a significant impact on public opinion. The goal of his research is to develop game mechanics that can teach players to think critically in a fun way and measurably increase the players' resilience to fake news.

Games have long been recognized as valuable tools for engaging and educating students in any age group.¹ There are already a number of board games and digital games that have been created with an educational purpose and which are successfully used for education. Examples include learning a foreign language², developing problem-solving skills³, helping children with ADHD⁴, improving social sensitivity⁵ or developing critical thinking skills.⁶

Game-based learning is experiencing a surge in popularity across formal and informal educational settings, primarily due to several key advantages it offers.⁷ Firstly, game-based learning fosters high levels of engagement among players.⁸ The interactive and immersive nature of games captivates students' attention, motivating them to actively participate in the learning process.

Additionally, game-based learning provides a safe environment for students to explore and experiment with different solutions to given problems.⁹ This freedom to make mistakes and learn from them encourages critical thinking, problem-solving, and creativity, as players can iterate and refine their strategies within the game.

Another advantage of game-based learning is its ability to shift a portion of the teaching process from the teacher to the students' interaction with the game itself. Games become facilitators of learning, allowing students to take ownership of their education. This shift empowers students, promoting their inner motivation to learn and discover.¹⁰

These advantages apply to both board and digital games. However digital games have gained more popularity in education, often being the go-to choice for incorporating gaming into learning experiences. The interactive and immersive nature of digital games, coupled with their ability to adapt to individual learners' needs, has made them a favoured tool among educators. However, it is important to recognize that board games have also demonstrated effectiveness in educational settings.¹¹ In recent years, there has been a notable surge in the popularity of modern board games, starting in the early 2000s's with classics like *Settlers of Catan*.¹² The global quarantine measures during the COVID-19

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pandemic further bolstered the popularity of board games, as people sought at-home entertainment.¹³ This increased interest in board games as a recreational activity can also translate into their recognition as effective educational tools.

Multiple studies have compared the tabletop and digital versions of different games, revealing interesting insights resulting in the superiority of tabletop versions in engagement.¹⁴ However, it is worth noting that the digitalized versions of board games are not always adequately reworked to suit the digital environment. As a result, the experience of playing these digitalized versions often falls short compared to the engaging and immersive experience offered by the physical counterparts.¹⁵

This raises an essential question worth further research: What are the key differences between games designed specifically for the digital environment and those originally designed as board games? Understanding the differences between these types of games allows educators and game designers to make informed decisions when selecting or creating games for educational purposes. Both types of games have their strengths and disadvantages, and the choice between them depends on the desired learning outcomes, available resources, and the preferences and needs of the learners.

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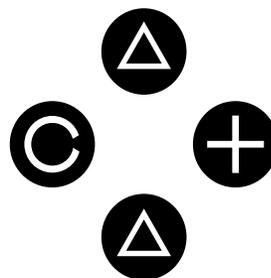
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