Gundolf S. Freyermuth

GAMES
GAME DESIGN
GAME STUDIES

An Introduction

With Contributions
by André Czauderna,
Nathalie Pozzi
and Eric Zimmerman

From:

Gundolf S. Freyermuth
Games | Game Design | Game Studies
An Introduction

How did games rise to become the central audiovisual form of expression and story-telling in digital culture? How did the practices of their artistic production come into being? How did the academic analysis of the new medium's social effects and cultural meaning develop?
Addressing these fundamental questions and aspects of digital game culture in a holistic way for the first time, Gundolf S. Freyermuth's introduction outlines the media-historical development phases of analog and digital games, the history and artistic practices of game design, as well as the history, academic approaches, and most important research topics of game studies.

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In the early 21st century we are now experiencing—as witnesses and as protagonists—the aesthetic development and cultural rise of a new audiovisual form of expression and narration. Like earlier forms of defining audiovisual media, such as theater, film, and television, digital games are shaping our self-perception as well as our perception of the world around us. Parallel to this development, two new practices and fields of research are emerging:

- For one, new practices in the field of software development—part handicraft, part art—are coming about, organized under the headings "Media Design" and "Game Design." Just as games differentiate themselves from movies through dramatic composition and means of representation—by tending towards nonlinearity and iterative experiences—, so does game design differentiate itself from the traditional practices of analog film production through iterative and less-linear tendencies.
- Second, a new academic discipline is forming: the analytical and critical interpretation of digital games. Just as we speak of literary studies, film studies, or design studies, so may we speak of Game Studies.

Consequently, the goal of this book is to offer a part-historical, part-theoretical introduction to address three aspects of digital games: 1) the origin and history of the new medium digital games, 2) the innovative processes of their production, and 3) the emerging discipline of their academic investigation. The following questions lie at the center of this study:

- How did digital games come to be and how did they rise to become the central audiovisual form of expression and storytelling in digital culture?
- How did the procedures of their technical-artistic production develop and what are the current practices of game design?

- How did the academic analysis of the social effects and cultural meaning of digital games form?
- Where is Game Studies today and in what direction is it developing?

In three chapters I will outline the stages of the media-historical development of analog and digital games (*I Games*), the history and artistic practices of their production in the context of analog and digital design (*II Game Design*), as well as the most important approaches and research questions of their analysis from the different perspectives of game design theory, social sciences and humanities (*III Game Studies*). Particular attention will be placed on the mutual relationship between game design and Game Studies in artistic-academic education and research.

First, two terms—which this volume already carries in its title—require clarification: *games* and *game design*. In Game Studies there has been some debate over which term best describes their object of scholarly focus—*computer game, videogame, digital game*. *Computer game* connotes games played on PCs and hardly those played on consoles, tablets or smartphones. *Videogame* connotes games that use moving pictures, meaning also pre-digital games like TENNIS FOR TWO (1958) or analog arcade games of the 1960s and 1970s. Corresponding thoughts can be found, for example, by Jesper Juul and Tristan Donovan.[1] Both authors have, for different reasons, nonetheless decided on the term *videogame*. However, in order to place the emphasis on games with a basis in digital technology, in this book I will primarily speak of *digital games* and will use *games* as a synonym to refer to the same concept. Older forms of games I will specifically reference as *analog games*.[2]

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[1] Juul, Jesper: *Half-Real: Video Games Between Real Rules and Fictional Worlds*, Cambridge, Mass.: MIT Press (Kindle edition) 2005, loc. 26 and Donovan, Tristan: *Replay: The History of Video Games*, Lewes, East Sussex: Yellow Ant (Kindle edition) 2010, loc. 74.

[2] Social and technological changes effect semantic change. The use of the word *computer* demonstrates that. According to the Oxford English Dictionary, *computer* was first used in 1613 as a designation for humans who were making calculations or computations (http://www.oed.com/view/Entry/37975?redirectedFrom=computer#eid). In 1869 *computer* was used for non-human calculators for the first time (ibid.; see also OED, ibid.). In everyday live, however, *computer* continued to denote "a *person* who solved equations; it was only around 1945 that the name was carried over to machinery." (Ceruzzi, Paul E. *A History of Modern Computing*, Cambridge Mass.: MIT Press 1998, p. 1) At that point it came to mean analog computing machines. If you were dis-

The term 'game design' is no less undefined. An important reason for this is the lack of codification with regard to the different roles involved in the production of digital games. So far a clear division of labor, as witnessed in theater, film and television, does not exist in game production. Game design is, therefore, often used to mean two different things: either to designate the entire process of game development or to designate a specific field of work in this production process along with the likes of game arts or game informatics.[3]

The title of this introduction uses the term clearly in the first, synecdochic sense: This book concerns itself with digital games, their production and their analysis. A central aspect of this process of production is, of course, game design in the second, narrower sense, which will be a central topic in chapter *II Game Design*.

PLAYING—GAMES

In his "Manifesto for a Ludic Century"[4] the game designer and game design theoretician Eric Zimmerman presents the thesis that a structural affinity exists between the fundamental characteristics of digital technology and the fundamental characteristics of games, analog as well as digital: "Games like Chess, Go, and Parcheesi are much like digital computers, machines for creating and storing numerical states. In this sense, computers didn't create games; games created computers."[5] Beyond that, digital networking would promote evermore-complex information systems. For a digital culture shaped by such systems, games would be the ideal medium thanks to their systematicity: "[G]ames are dynamic systems […] While every poem or every song is certainly a system, games are dynamic systems in a much more literal sense. From Poker to Pac-Man to War-

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cussing one of the few existing digital computers, you had to explicitly emphasize this. Within a decade, however, this relation reversed: By the end of the 1950s, computer meant digital computer. If you were discussing analog computers, you had to explicitly emphasize this.—The cultural rise of digital games seems to effect a similar change: The word "game" has come to mean digital game. If we are discussing analog games, we soon might have to explicitly emphasize this.

3   Compare for a definition of these fields of work below. p. 140.

4   Zimmerman, Eric: "Manifesto for a Ludic Century," *Kotaku*, September 9, 2013; http://kotaku.com/manifesto-the-21st-century-will-be-defined-by-games-1275355204.

5   Ibid.

craft, games are machines of inputs and outputs that are inhabited, manipulated, and explored."[6]

Film and television, the defining media of the 20th century, corresponded—with the linearity of their passively received audivisions—to the information and entertainment needs of industrial work and culture. Digitalization, however, writes Zimmerman, initiated a categorical metamorphosis: "In the last few decades, information has taken a playful turn. […] When information is put at play, game-like experiences replace linear media."[7] Games would, therefore, become the most important medium of the ludic 21st century: "Increasingly, the ways that people spend their leisure time and consume art, design, and entertainment will be games—or experiences very much like games."[8]

Zimmerman's "ludic manifesto" can be understood as a concise depiction of perspectives and opinions that are circulating in contemporary culture. Indeed, before our eyes a lasting medial upheaval is taking place that targets audiovisual forms of expression and representation. Their transformation is the product of technological progress—a development which has already occurred twice in modern times.[9]

Between the Renaissance and the Enlightenment, mechanization brought about the theater of illusion with its proscenium or picture-frame stage, outfitted with the most modern technical means available. For example, equipment and procedures used in shipbuilding to quickly move heavy objects were put into practice in theaters to move sets and even actors. Thanks to its mechanical means for manipulating space and time, the theater of illusion and its most important genre, the drama, became the genuine audiovisual form of storytelling in the pre-industrial period.

With the next technological push brought about between the Enlightenment and postmodern times through industrialization, photography was introduced, followed by film and, finally, television; the last two, of course, were based on the technology first developed for and by photography. Through means of stored, edited and "made to move" pictures and sounds, time and space could be manipulated as never before and new kinds of stories could be told audiovisually. This categorical performance increase over the theater—the potential for a successive development of epicness of audiovisual representation—film and television owe to evermore-advanced industrial recording, storing, editing,

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6   Ibid.

7   Ibid.

8   Ibid.

9   Compare for this in more detail below p. 128ff.

distribution and transfer techniques. In the medium of linear audiovisuality, feature films and television series emerged as genuine and dominant storytelling methods of industrial culture. Thus, since the early 20th century, first silent movies, then talkies, and finally television influenced the audiovisual construction of reality and its perception.

Against this media-historical background it should be no surprise that aesthetic consequences are also tied to the current technological push: digitalization. Digital software allows the recording, generation, storing, editing, distribution and interactive manipulation of texts and sounds, as well as still and moving pictures. Through two unique characteristics, software thereby distinguishes itself from all analog media as a means of production and storage. First, software is transmedial. In the universal medium of stored bits and the software programs with which they can be edited, the analog diversity of specific media and tools—paper and typewriter, celluloid, camera and cutting room, vinyl, magnetic tape, microphone and mixing board etc.—is unified. Second, the digital transmedium possesses a 'fluidity' that, together with feedback systems, to a large extent eliminates the primacy of chronology that characterizes analog mediality.[10] In this quality lies the principal interactivity of the transmedium known as software.

This potential for transmediality and fluidity is aesthetically realized above all in digital games. Earlier, movies simultaneously expressed the experiences of, and impacted, industrial culture—not least in the industrial work environments of hierarchical and linear processes. The experiences of digital culture are expressed similarly today in digital games, which are now also impacting the postindustrial work environment that is characterized by knowledge-work, i.e., networked manipulation of digital symbols. The machine as central metaphor for industrial culture is replaced by the game as a central metaphor for digital culture.[11]

Society, said Niklas Luhmann, creates media for the purpose of self-observation.[12] Digital games are the youngest means—medium—for such reality construction and, thereby, also for perceiving the world as well as for self-perception. As Noah Wardrop-Fruin writes, games allow us—more so than linear audiovisual media do—"to understand our evolving society, in which (often hidden)

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10 Compare below chapter II, part *2 Digital Design,* p 149ff.

11 See Chaplin, Heather: "Will The 21st Century Be Defined By Games?," *Kotaku*, September 12, 2013; http://www.kotaku.com.au/2013/09/will-the-21st-century-be-defined-by-games/

12 Luhmann, Niklas. *The Reality of the Mass Media*, Stanford, Calif.: Stanford University Press 2000, p. 97.

software models structure much of how we live now."[13] In the interactive mirror of digital games we experience ourselves and search for an understanding of what is under development in our everyday lives—a digital society and culture just as different from the industrial culture of the 19th and 20th centuries as that culture was distinct from the society and culture of the preindustrial period.

The first part of this book (*I Games*) describes how digital games went from their—audiovisually as well as narratively restricted—beginnings in the middle of the past century to the equally narrative and hyperrealistic medium of today that is able to compete with film and television. The starting point is formed by an analysis of the diverse attempts to define analog as well as digital games (*I-1 What is a game? Systematic and Historical Approaches*). The overview leads to the understanding that, like all media and arts, digital games can only be understood in their historical development. The second chapter, therefore, outlines the history of games in the context of modern media and the arts (*I-2 Games in the Modern Era: A Short Media History*). The broader focus then lies on the three artistic-technical pushes in which digital games have evolved since the middle of the 20th century (*I-3 Procedural Turn, since the 1950s; I-4 Hyperepic Turn, since the 1970s; I-5 Hyperrealistic Turn, since the 1990s*). At the preliminary end of this development, digital games characterize themselves in their otherness in relation to both analog games and linear audiovisions.[14] I seek to define this otherness in the sixth chapter (*I-6 The Double Alterity of Digital Games*). A further turn that has been transpiring for several years now has led to the proliferation of natural user interfaces (NUIs) and 'natural' ways of interacting with virtual worlds and non-player characters (NPCs). This turn should further strength-

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13 Wardrip-Fruin, Noah: *Expressive Processing: Digital Fictions, Computer Games, and Software Studies*, Cambridge, MA: The MIT Press 2009, p. 19.

14 For the term "audiovisions" see Zielinski, Siegfried: *Audiovisions: Cinema and Television as Entr'actes in History*, Amsterdam: Amsterdam University Press 1999: "Audiovision has become an amalgam of many media communication forms that used to be separate and is thus, for the interim, the fulfillment of that project to occupy the minds and hearts with culture-industrial commodities, which was begun in the nineteenth century." (p. 14) Zielinsky distinguishes four "dispositif arrangements" that exist so far: (1) the mostly pre-cinematic "production of illusions of motion in space with the aid of a heterogeneous ensemble of picture machines"; (2) cinema; (3) television; (4) digital "audiovisions, as a complex construction kit of machines, storage devices, and programmes for the reproduction, simulation, and blending of what can be seen and heard …" (p. 19).

en the categorical otherness of digital games (*I-7 A Look Ahead: Hyperimmersive Turn?*).

In the development of digital games, their relation to film has carried a special meaning. Since the 1980s both of these forms of audiovisual media have been engaged in a close technical, economic and aesthetic exchange, while at the same time they have been competing for both consumers and talent. More than a few artists and theoreticians have even envisaged a merging of the two audiovisual media. The *Intermezzo: Game // Film* first takes stock (*Intermezzo-1 Game and Film*), only to then look back on the earlier audiovisual rivalries between theater and film as well as between film and television and to discuss which of the two historical models the relationship between games and film will most closely come to resemble (*Intermezzo-2 Audiovisual Rivalries*). Foundational for the aesthetic relationship between audiovisual media in general and between games and film in particular proves to be their highly different affordances for the manipulation of time and space in the representation of narrative processes (*Intermezzo-3 Modes of Audiovisual Storytelling*).

MAKING GAMES—GAME DESIGN

Whoever develops digital games today is historically privileged: they are confronted with the opportunity, as only very few generations before them, to actively help shape the important beginnings and to set the course of a radically new medium. Contributing to this opportunity is the fact that since the turn of the century no other medium has made progress that was as speedy—both in an economic as well as a technical-aesthetic respect.

In 2014 digital gaming made up an approximately 86 billion-dollar industry, up from 23.3 billion in 2003 and 52.5 billion in 2009.[15] The seven countries with the highest game revenues were the US (22 billion), China (18 billion), Japan (12 billion), South Korea (3.8 billion), Germany (3.6 billion), the UK (3.5 billion) and France (2.7 billion).[16] However, there exists a huge international imbalance between production and consumption. Germany, for example, is the largest market in Europe, but non-German companies produced 75% of German

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15 N. N.: "Global Revenues of the Video Game Industry from 2003 to 2014," http://ww
    w.statista.com/statistics/269744/global-revenues-of-the-video-game-industry-since-20
    03/, as of Aug 6, 2015.

16 N. N.: "Top 100 Countries by Game Revenues," http://www.newzoo.com/free/rankin
    gs/top-100-countries-by-game-revenues/

revenue. Furthermore, German games make up only three percent of the world market, which is dominated by American productions, followed by games made in Japan, Canada and the United Kingdom.[17]

In 2013 the worldwide most successful game was GRAND THEFT AUTO V. On its first day alone it brought in 800 million dollars: "…more money than any movie—*Titanic* or *Avatar* or *The Avengers*—has made in its entire run in North American theaters. And given the game's $270 million budget, it may also have cost more than any movie."[18] AAA games—meaning digital games that are produced with a large budget and promoted with a great deal of marketing—are even bigger global phenomena than literary bestsellers and movie blockbusters.

Cultural differences among the bestselling games can be seen most clearly in popular sports. In 2013 in the US, for example, MADDEN NFL 25 belonged to the top-five bestselling games with 2.7 million copies sold.[19] In Germany, the soccer-simulator FIFA 14 took the top spot in place of the football-simulator with around 870,000 copies sold.[20] Certain differences also show themselves in the

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17 N. N.: "Hintergrund: Computer- und Videospiele in Deutschland: Kreativbranche mit Wachstum- und Innovationspotential," *BIU—Bundesverband Interaktive Unterhaltungssoftware*, 2014; http://www.biu-online.de/de/presse/newsroom/themendossier-computer-und-videospiele-in-deutschland.html; Quillen, Dustin: "Canada Overtakes U.K. as Third Largest Game Maker. Canada now sits behind the U.S. and Japan in the ranks of top game developing nations," *1Up.com*, April 6, 2010; http://www.1up.com/news/canada-overtakes-largest-game-maker.—This situation is somewhat similar to the film business where Anglo-Saxon productions dominate the global market as well: In 2013, Hollywood film productions "held a share of nearly 70% of the EU market, while European productions represented only 26%." (European Parliament Think Tank: "An Overview of Europe's Film Industry," December 16, 2014; http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2014)545705)— In 2014, German movies had a German market share of only 26.7 percent. (N. N., "The German Film Scene Production – Subsidies – Contacts A Comprehensive Overview," June 25, 2015; http://www.german-films.de/fileadmin/mediapool/pdf/Marktanalyse/THE_GERMAN_FILM_SCENE_2014_25June2015.pdf)

18 Corliss, Richard: "Prisoners Wins the Weekend, but It's No 'Grand Theft Auto V'," *Time*, September 22, 2013; http://entertainment.time.com/2013/09/22/prisoners-wins-the-weekend-but-its-no-grand-theft-auto-v/

19 N. N.: "USA Yearly Chart: The Year's Top-Selling Game at Retail Ranked by Unit Sales—2013," *VGChartz* 2014; http://www.vgchartz.com/yearly/2013/USA/

20 N. N.: "Germany Yearly Chart: The Year's Top-Selling Game at Retail Ranked by Unit Sales—2013," *VGChartz* 2014; http://www.vgchartz.com/yearly/2013/Germany/

popularity of platforms and genres. In the US, games played on computers make up only a fraction of total revenue—220 million of the 15.4 billion dollars total brought in by game software in 2013.[21] In contrast, in Germany 76% of all gamers sit at a computer.[22] However, smartphones enjoy the same amount of popularity in both countries (44% in the US as well as Germany).[23]

The demographic data also converge over time if one adopts a long-term perspective. In 2013 59% of Americans played digital games; 52% of these gamers were men and 48% women.[24] 29% were under 18 years old and 39% over 36. In Germany almost every other person played regularly—the numbers fluctuate between 34.2 million and 39.8 million German gamers.[25] The percentage of female gamers in Germany was at 44%. 29% of German gamers were under the age of 18 and 20% over 50.[26]

The constant growth—more gamers, more games, higher revenue—, which has characterized the cultural assertion of digital games since the 1970s, occurred in the context of constant change in the requirements of production, distribution, and use. The foundation for this ongoing radical transition was laid with the establishment of first stationary and then also mobile broadband networking. Since the 1990s, the distribution and use of AAA console and PC titles has been virtualized and novel distribution platforms have emerged (*Steam* as well as app stores from Apple and Android, among others). In the USA the share of digital distribution rose between 2010 and 2014 from 29% to 52%.[27] The in-

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21 ESA, Entertainment Software Association: "Essential Facts about the Computer and Video Game Industry 2013," April 2014, p. 12 http://www.theesa.com/facts/pdfs/ESA_EF_2014.pdf

22 Illek, Christian P.: "Gaming in Deutschland," *Bitkom*, August 13, 2013; http://www.bitkom.org/files/documents/BITKOM_Praesentation_Gaming_PK_130813(1).pdf

23 ESA: "Essential Facts about the Computer and Video Game Industry 2013," p. 5; Illek: "Gaming in Deutschland."

24 ESA: "Essential Facts about the Computer and Video Game Industry 2013," pp. 2-3.

25 N. N.: "Infographic: The German Games Market," *Newzoo: Games Market Research*, January 6, 2014; http://www.newzoo.com/infographics/infographic-german-games-market/

26 BIU, Bundesverband Interaktive Unterhaltungssoftware: "Altersverteilung," 2014; http://www.biu-online.de/de/fakten/reichweiten/altersverteilung.html

27 ESA: "Essential Facts about the Computer and Video Game Industry 2014," p. 13.— In most other countries, the virtualization of distribution is lagging behind. For example, in Germany the market share of downloaded PC and console games grew from 7% in 2010 to 32% in 2014. (BIU, Bundesverband Interaktive Unterhaltungssoftware:

troduction of smartphones, starting in 2007 with Apple's iPhone, and of touch-tablets, starting in 2010 with Apples's iPad, popularized the new genre of mobile and casual games.

In the last decade, the extreme development of distribution channels for digital games has correlated with equally strong changes in how they are financed. Promoted as well through ubiquitous digital networking, a variety of alternative economic approaches, processes, and funding models came about. Disruptive were, for one, Free-to-Play (F2P) and freemium models, based on micropayments in games that started off free, and for another pre-financing through so-called crowdfunding, i.e., the collecting of a large number of small contributions by future users of technical or medial products that had yet to be produced.

Among the currently most successful F2P online games are LEAGUE OF LEGENDS, which brought in almost a billion dollars worldwide in 2014, as well as CROSSFIRE and DUNGEON FIGHTER ONLINE—both sitting at about 900 million dollars each.[28] In the field of F2P casual games, three count as the most important measuring sticks for all others: (1) FARMVILLE (2009), which had, at one point, over 80 million monthly users on Facebook[29], stayed the most popular game for two years, despite attacks from critics[30] and brought in more than a billion dollars in revenue;[31] (2) ANGRY BIRDS (since 2009), which in 2014 had been downloaded more than 2 billion times in its various incarnations,[32] and (3) CAN-

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"Kauf digitaler Spiele per Download," 2014; http://www.biu-online.de/fileadmin/ user_upload/bilder/marktzahlen/2014/Marktzahlen_-_2014_gesamt/Infografik_-_Kauf _per_Download/BIU_Infografik-4_Kauf_per_Download.PNG)

28 Campbell, Colin: "How League of Legends is Upending the Video Game Business," October 24, 2014; http://www.polygon.com/2014/10/24/7061573/how-league-of-lege nds-is-upending-the-video-game-business

29 Cashmore, Pete: "FarmVille Surpasses 80 Million Users," *Mashable*, February 20, 2010; http://mashable.com/2010/02/20/farmville-80-million-users/

30 On the controversy around FARMVILLE and Ian Bogost's satire game COW CLICKER (2010) see Tanz, Jason: "The Curse of Cow Clicker: How a Cheeky Satire Became a Videogame Hit," *Wired*, December 20, 2011; http://archive.wired.com/magazine/20 11/12/ff_cowclicker/all/

31 See Ha, Anthony: "Zynga's Pincus Says FarmVille Has Passed $1B In Total Player Purchases," *TechCrunch*, February 4, 2013; http://techcrunch.com/2013/02/05/farmvil le-1-billion/

32 Long, Neil: "Two Billion Downloads? We're Just Getting Started, Says Angry Birds Creator Rovio," January 23, 2014; http://www.edge-online.com/features/two-billion-downloads-were-just-getting-started-says-angry-birds-creator-rovio/

DY CRUSH SAGA (2012), which in 2013 was played daily by 93 million people for more than a billion plays, while around 4% of players made in-game purchases[33]. Analyzing the MMO Game Marketplace, Cameron Koch states: "Free-to-play works because it eliminates any barrier for entry, and allows developers to penetrate markets that otherwise might be unable to play traditional console video games. […] By having millions upon millions of players, even a small percentage of players paying money regularly can add up big time."[34]

As influential for the development of games was the establishment of virtualized and globalized subscription models, as they existed in principle during the early modern era at the beginning of the production of printed books. Games, which cannot find funding through traditional channels, can be financed on platforms like Indiegogo (founded 2008), Kickstarter (2009), or the German Startnext (2010). By its own account, Kickstarter alone had collected 1.5 billion dollars for 75,000 projects across 220 countries by the end of 2014, among which was a quarter-billion dollars for more than 4,000 digital games.[35] So far, the most successful game projects on Kickstarter have been TORMENT: TIDES OF NUMENERA, which raised 4.2 million dollars in 2013, PROJECT ETERNITY (later titled: PILLARS OF ETERNITY), which reached 4 million in 2012, as well as MIGHT NO. 9, which made 3.8 million in 2013.[36] The "upcoming space trading and combat simulator"[37] STAR CITIZEN, by the game design veteran Chris Roberts (WING COMMANDER, 1990) has managed, through a combination of traditional Kickstarter campaign and a self-run crowdfunding website, to accumulate over 85 million dollars between 2012 and 2015.[38]

Just as with the older audiovisual media of theater, film, and television, the economic potentials of digital games are based on the requirement that products

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33 Grubb, Jeff: "King: 93M Daily Candy Crush Saga Players, 500M installs, and $568M Profit in 2013," *VentureBeat*, February 18, 2014; http://venturebeat.com/2014/02/18/candy-crush-saga-publisher-king-by-the-numbers-inforgraphic/

34 Koch, Cameron: "Free-to-Play Games Continue to Dominate the MMO Game Marketplace," *Techtimes*, October 24, 2014; http://www.techtimes.com/articles/18666/20141024/free-to-play-games-continue-to-dominate-the-digital-video-game-marketplace.htm

35 N. N.: "Stats," *Kickstarter*, November 28, 2014; https://www.kickstarter.com/help/stats?ref=footer

36 N. N.: "Most Successful Crowdfunding Campaigns," *CrowdfundingBlog*, October 29, 2014; http://www.crowdfundingblog.com/most-successful-crowdfunding-projects/

37 N. N.: *Star Citizen Wiki*, November 2014; http://starcitizen.wikia.com/wiki/Star_Citizen

38 https://robertsspaceindustries.com/funding-goals; as of August 5, 2015.

achieve a certain technical and artistic quality. A decisive structural condition has emerged only over the last decade with the increase of technical options: small groups and even individuals now possess means of production that two decades ago were the exclusive privilege of large companies and corporate groups and, thereby, also only of highly specialized experts. Admittedly, with access to these new technical means comes the challenge to use them artistically in a way that is appropriate and creative. Four developments influenced game design over the last decade:

- A latent stagnation and aesthetic crisis of AAA titles developed through a high degree of division of labor;
- The rise of a so-called indie scene, whose 'small' games are anchored outside of the commercial mainstream and tend towards artistic experimentation and breaking out of traditional schemas;
- A proliferating differentiation into evermore specific subgenres combined with a strong increase in the number of titles being produced;
- The introduction of practices and mechanisms of game development into other production and service areas.[39]

The last of these proves the outstanding position that digital games occupy in the emerging digital media dispositif. Once upon a time the new medium of film influenced the other, older arts: theater and the novel, painting and music developed cinematic qualities. No differently, digital games—namely their aesthetic qualities, such as the mass phenomenon of their interactive reception—are influencing media production and consumption today, especially in the areas of the competing audiovisual media of film and television. Parallel to that the procedures of game design as a production method for audiovisual media are becoming a central practice of digital culture—from the adoption of 'world building'[40], as it is a common practice in game design, by advanced film productions or by the diverse visualization attempts in research and industry to the 'gamifying' applications of game design principles in marketing or knowledge transfer.[41] As a

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39 See for gamification below p. 224ff.

40 See Freyermuth, Gundolf S.: "Der Big Bang digitaler Bildlichkeit: Zwölf Thesen und zwei Fragen," in: Freyermuth, Gundolf S./Gotto, Lisa (ed.), *Bildwerte: Visualität in der digitalen Medienkultur*, Bielefeld: transcript 2013, pp. 287-333, here p. 293 ff.

41 See for example Zichermann, Gabe/Cunningham, Christopher: *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*, Sebastopol, Calif.: O'Reilly Media 2011.

basic tendency one can thereby identify a 'democratization of game design': a steady cheapening and simplification of the financing, conception, production, global distribution and use of digital games.[42]

In *II Game Design* I will first analyze the double origins of game design: on the one hand from practices of analog design, especially its principles of proto-typing and iteration that have arisen since the beginning of Industrialization in the context of producing hardware artifacts (*II-1 Analog Design*); on the other hand from practices of digital design that developed since the mid-20th century in the context of software production and visual design (*II-2 Digital Design*). Due to these dual origins during the last half-century in the design of digital games, the development of highly different procedures took place: The non-commercial beginnings in the academic hacker culture of the 1960s and 1970s gave way to the professionalization of the game industry, following in the footsteps of the in-dustrial, highly collaborative role model of film production and especially that of Hollywood. Since the turn of the century an indie scene is also thriving that in its methods of working orients itself more closely toward the rather artistic role models of indie music and indie film (*II-3 A Short History of Game Design*). Next, I analyze the role of the Game Designer and the most important fields in the production of digital games (*II-4 Areas of Game Design*) as well as the standard procedures and processes in game production, including the basic prin-ciple of world building. In a special contribution, Nathalie Pozzi and Eric Zim-merman then provide a primer for the all-important method of playtesting (*II-5 Practices of Game Design*). Evidently game design is becoming a central disci-pline of creative production in digital culture. Its role model effect is changing the design of soft- and hardware, processes and experiences.

THINKING GAMES—GAME STUDIES

In contradistinction to the central and still growing importance of games as well as game design in digital culture, Game Studies continue to play only a minor role both in public perception and in academia. Groundbreaking monographs,

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42 On the question regarding the most exciting development tendency in the game indus-try, the game developers Randy Smith and Josh Holmes answered with "the democra-tization of game development," i.e., "the 'democratization' of game development and the rise of the indie developer." (Cited after Fullerton, Tracy. *Game Design Work-shop: A Playcentric Approach to Creating Innovative Games*. Boca Raton: CRC Press/Taylor & Francis (Kindle edition) 2014, loc. 1800 und loc. 5148).

which understood and interpreted games as a new medium and a new form of expression, were first published in the last decade of the 20th century, roughly 40 years after the development of early forms of digital games in research labs. The institutional establishment of Game Studies as an academic field only began in the early 21st century and parallel to the establishment of the first artistic-technical degree paths for game design. Anglo-Saxon and Scandinavian universities were pioneers of this process. In the German speaking world such an establishment is still pending:

"Although individual professors and assistant professors are, by now, beginning to make game studies a focal point, this is still not reflected in the disciplines (e.g. at the Technical University for Visual Arts Braunschweig, the University of Paderborn, and the University of Cologne). Beyond that, both small and large third-party-funded projects as well as (virtual) institutes for computer game research sprung into existence (for instance, at the Center for Art and Mediatechnology in Karlsruhe and at the University for Media in Stuttgart, or the Zurich University of the Arts). Finally, at the beginning of 2014, a novel professorship for game studies was established in the context of the artistic-academic bachelor 'Digital Games' at the Cologne Game Lab at the Cologne University of Applied Sciences. However, despite these advances, it is still impossible to speak of any fundamental establishment of the field in the German language-space."[43]

The formation of new disciplines is nothing special *per se*. Since the sciences and humanities followed the example of the industrial division of labor and became specialized, 'Taylorized,' perpetual processes of differentiation have led to literally hundreds of new disciplines and fields of study. Only very rarely, however, was it possible to found a new discipline whose subject was a culturally defining medium, i.e., a medium which influences and changes the thinking of a majority of people—their view of the world, their understanding of life, and even of their own identity.

The modern process of establishing new disciplines dealing with defining media started during the first half of the 19th century when the analysis of and reflection on language and literature became academic endeavors. Since the En-

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43 Beil, Benjamin/Freyermuth, Gundolf S./Gotto, Lisa: "Vorwort," in: Beil, Benjamin/ Freyermuth, Gundolf S./Gotto, Lisa (ed.), *New Game Plus: Perspektiven der Game Studies. Genres – Künste – Diskurse*, Bielefeld: transcript 2015, pp. 7-24, here p. 8; the Cologne University of Applied Sciences has since been renamed TH Köln—University of Applied Sciences. (All quotes from German language sources have been translated for this edition.)

lightenment and especially in the German-speaking world, literature was thought to promote what had otherwise proven elusive: cultural identity and political unity. Consequently, literature, which during the 19th and early 20th century influenced public consciousness more than any other medium in most developed regions of the world, separated into nationally defined categories despite cultural exchange. Along similar lines, literary studies grew into national academic disciplines operating in the context of national self-assurance and nationalism.[44]

Next, a good half-century after the advent of motion pictures—a new medium of artistic expression particularly symptomatic of the industrial mentality[45]—, the academic study of film was organized and institutionalized. Just as economic factors of movie production encouraged (or coerced) planning and production beyond national borders,[46] so too did film studies develop—in line with the supra-national influence, distribution and reception of its material—mostly beyond national boundaries and specialization.

Now, since the turn of the century and again several decades after the social and aesthetic emergence of a new medium, digital games, the new discipline of Game Studies is finally forming.[47] As an audiovisual medium of expression, representation and storytelling, video games are produced, distributed and used not just nationally or internationally within larger cultural realms, but globally. In digital culture they influence the perception of the self and of the world beyond all borders, i.e., transnationally. As the youngest of the disciplines that deal with a single medium and art form, Game Studies remains in its early stages and continues to draw sustenance from its respective geographical roots. To date the dis-

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44 See Lämmert, Eberhard: "Germanistik – eine deutsche Wissenschaft," in: Lämmert, Eberhard, et al. (ed.), *Germanistik – eine deutsche Wissenschaft*, Frankfurt a. M.: Suhrkamp Verlag 1967, pp. 7-41.

45 See Benjamin, Walter: "The Work of Art in the Age of Mechanical Reproducibility" (3rd version), in: Benjamin, Walter, *et al. Selected Writings*. 4 vols, Cambridge, Mass.: Belknap Press 1996, vol. 3, pp. 251-283, here p. 281, note 42: "Film is the art form corresponding to the increased threat to life that faces people today."

46 See, Arnold: *The Social History of Art*, 4 vols., London, New York: Routledge 1999 (*1951), p. 159.

47 See, for example, Egenfeldt-Nielsen, Simon/Smith, Jonas Heide/Tosca, Susana Pajares: *Understanding Video Games: The Essential Introduction*, New York: Routledge 2008; Mäyrä, Frans: *An Introduction to Game Studies*, London: SAGE (Kindle edition) 2008.

cipline, in regard to its subject matter and institutional organization, has yet to follow in the footsteps of its art form, which is inherently global.[48]

Their status quo indicates, however, not only a low degree of institutional presence, but also an extreme diversity of topics and approaches. Practice-oriented game design theories formulated since the early 1980s confront approaches from the social sciences and humanities that date their origins to the 1990s: an eclectic mix of theories taken from older disciplines, such as educational research, media pedagogy, psychology, and design theory, as well as sport and social sciences, literature, art, and media studies. In a positive light, this diversity can be interpreted as a naturally developing interdisciplinarity. In a negative light, it can be seen as a lack of theoretical coherence and, thereby, also as a lack of the disciplinarity required for the creation of a common ground to serve as a necessary precondition for interdisciplinary research.

For example, what Mark Butler stated a few years ago: "The texts about computer games that exist so far suffer mostly from too restricted subject horizons," is true still today: "Computer games fall into the scope of numerous disciplines that either want nothing to do with them, or attempt to coopt them for their own use."[49] Butler's institutional perspective correlates with Franz Mäyrä's view, which is oriented toward content: "scholars […] bring with them the methodologies typical for their original disciplines."[50] The same conclusion is reached by Simon Egenfeldt-Nielsen, Joan Heide Smith, and Susana Pajares Tosca:

"[G]ame researchers are an eclectic bunch with a multidisciplinary background. Humanist scholars with film or literature backgrounds constitute the largest single group, but game research conferences are also attended by social scientists (mostly sociologists) and, very importantly, game designers. [...] Most researchers, at least at present, choose to adopt

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48   The Anglo-Saxon and Scandinavian countries' head start continues. In Germany the first university-level educational offerings are starting to arise. For German-language research, three more recent publications are: Beil, Benjamin: *Game Studies: Eine Einführung*, Red guide, Berlin: Lit 2013; Michael Hagner and Games Coop: *Theorien des Computerspiels zur Einführung*, Hamburg: Junius 2012; Freyermuth, Gundolf S./Gotto, Lisa/Wallenfels, Fabian (ed.): *Serious Games, Exergames, Exerlearning: Zur Transmedialisierung und Gamification des Wissenstransfers*, Bild und Bit (Bielefeld: transcript, 2013).

49   Butler, Mark: *Would you like to play a game? Die Kultur des Computerspielens*, Berlin: Kulturverlag Kadmos 2007, p. 8.

50   Mäyrä, Frans: *An Introduction to Game Studies*, loc. 2333.

methods and approaches from their primary fields. Ethnographers tend to observe players. Those trained in film studies tend to analyze the games themselves and communication scholars tend to analyze interactions between players."[51]

This diversity results in, on the one hand, the necessity for creating a common ground for Game Studies: defining the object and the borders of the discipline, as well as specific approaches and methods. On the other hand, this diversity also presents the twofold question: To what degree, in a time of transmedial media technology and also transmedial media production, can individual disciplines of media—especially of the audiovisual media of film, television, web video, and games—still understand the transmedial development and the embedding of different media in this process? Or is, maybe, an all-encompassing comparative media studies required?

Part *III Game Studies* presents the development and central positions of various approaches in the theoretical and—more or less—academic study of digital games. The starting point is formed by philosophical and single-field studies of analog games, from Gottfried Wilhelm Leibniz, to Johan Huizinga, all the way to Marshall McLuhan (*III-1 Theories of Analog Games vs. Theories of Digital Games*). This prehistory of Game Studies closes with an outline of the existing three big avenues for research: approaches from game design theory, the social sciences, and the humanities (*III-2 The Schisms of Game Studies*). The observation and description of them working together and, even more frequently, side by side, reveals the necessity for replacing the existing schisms in Game Studies with an analysis that no longer operates with imported approaches. Instead its focus and methods would arise from the direct confrontation with and the analysis of digital games themselves (*III-3 Desideratum: Overcoming the Schisms*). In conclusion and looking ahead, research perspectives will be developed that could serve the desired evolution of Game Studies (*III-4 Perspectives of Research 1: Digital Games; III-5 Perspectives of Research 2: Serious Games*).

The prevention of a rift between artistic and academic practices—as it exists in older forms of media—is equally important for a successful adaptation of Game Studies to its subject. The epilogue reflects, therefore, how game design and Game Studies are and should be conveyed in academic and artistic education. In a special contribution, André Czauderna analyzes the structures of six undergraduate game design programs from five different countries, while I discuss the objectives and the organization of game design education by the example of one artistic-academic bachelor program. In conclusion, I reflect on the

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51 Egenfeldt-Nielsen et al.: *Understanding Video Games*, loc. 351 und loc. 360.

consequences of this on-going academization—from changes in aesthetic pro-
duction to a possible maturation of the medium and an increase of game literacy.
(*Epilogue: Academization and Aesthetic Production*).

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52 Freyermuth, Gundolf S.: "Spiel // Film. Prolegomena zu einer Theorie digitaler Audi-
ovisualität," in: Kaminski, Winfred/Lorber, Martin (ed.), *Clash of Realities 2010:
Computerspiele: Medien und mehr…*, Munich: kopaed 2010, pp. 27-46; Freyermuth,
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Enyedi, Ildiko (ed.), *New Skills for New Jobs / New Skills for Old Jobs: Film and Me-*

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dia Schools in the Digital Revolution, Budapest: University of Theatre and Film Art 2012, pp. 21-39; Freyermuth, Gundolf S.: "Ursprünge der Indie-Praxis. Zur Prähistorie unabhängigen Game Designs," in: Kaminski, Winfred/Lorber, Martin (ed.), Gamebased Learning. Clash of Realities 2012, Munich: kopaed Verlag 2012, pp. 313-326; Freyermuth: "Der Big Bang digitaler Bildlichkeit"; Freyermuth, Gundolf S.: "Angewandte Medienwissenschaften. Integration künstlerischer und wissenschaftlicher Perspektiven in Lehre und Forschung," in: Ottersbach, Beatrice/Schadt, Thomas (ed.), Filmlehren. Ein undogmatischer Leitfaden für Studierende, Berlin: Bertz + Fischer 2013, pp. 263-278; Freyermuth, Gundolf S.: "Serious Game(s) Studies. Schismen und Desiderate," in: Freyermuth, Gundolf S./Gotto, Lisa/Wallenfels, Fabian (ed.), Serious Games, Exergames, Exerlearning: Zur Transmedialisierung und Gamification des Wissenstransfers, Bielefeld: transcript 2013, pp. 421-464; Freyermuth, Gundolf S.: "Vom Drama zum Game. Elemente einer historischen Theorie audiovisuellen Erzählens," in: Kaminski, Winfred/Lorber, Martin (ed.), Clash of Realities 2014: Computerspiele: Spielwelt-Weltspiel: Narration, Interaktion und Kooperation im Computerspiel, Munich: kopaed 2014, pp. 29-37; Freyermuth, Gundolf S.: "Der Weg in die Alterität. Skizze einer historischen Theorie digitaler Spiele," in: Beil, Benjamin/Freyermuth, Gundolf S./Gotto, Lisa (ed.), New Game Plus: Perspektiven der Game Studies. Genres – Künste – Diskurse, Bielefeld: transcript 2015, pp. 303-355; Freyermuth, Gundolf S.: "Game Studies und Game Design," in: Sachs-Hombach, Klaus/Thon, Jan-Noël: Game Studies. Aktuelle Anstäze der Computerspielforschung, Cologne: Herbert von Halem 2015, pp. 67-100.