P(l)aying Music and Games

Stefan Strötgen

1 Big business

Video and computer games were once considered to be just kids' stuff. But nowadays these kids are grown up, are still playing computer games and their kids are as well.[1] Consequently, gaming has become an important part of recreation activities and thus a major factor of the entertainment industry. In 2009, the German gaming software market achieved a revenue of nearly €1.6bn, which equals an increase of 82% within 10 years (see figure 1) and, worldwide, hardware and software retail sales for the year 2010 have been forecast to be $46.5bn (Collins 2008a: 107).[2]

Economic success within this impressively growing market was and still is, for the most part, technology driven. Concerning sound and music, the development from the mid-1980s to the mid-1990s especially was characterized by heavy competition among platform as well as game developers concerning the improvement of sound technology and its use in order to achieve well-sounding results with limited means.[3] A landmark within this development was the introduction of Sony's PlayStation, which could also play 'real' pre-recorded music. But since recorded music requires more memory space, this development first led to an internal competition between audio and graphics due to the lack of it (Belinkie 1999). It also posed new problems concerning the interactivity of game sound, since real audio could not be integrated into gameplay without further ado.[4]

[1] E.g. in 2009 approximately one third of German gaming platform users (pc, console, handheld) were at least 30 years old (Bundesverband Interaktive Unterhaltungssoftware 2010). Collins (2008a: 107) reports that about three quarter of US households play computer or video games. Tessler (2008: 14) refers to another statistic, which estimates that 60% of North Americans and 40% of Europeans play video games.

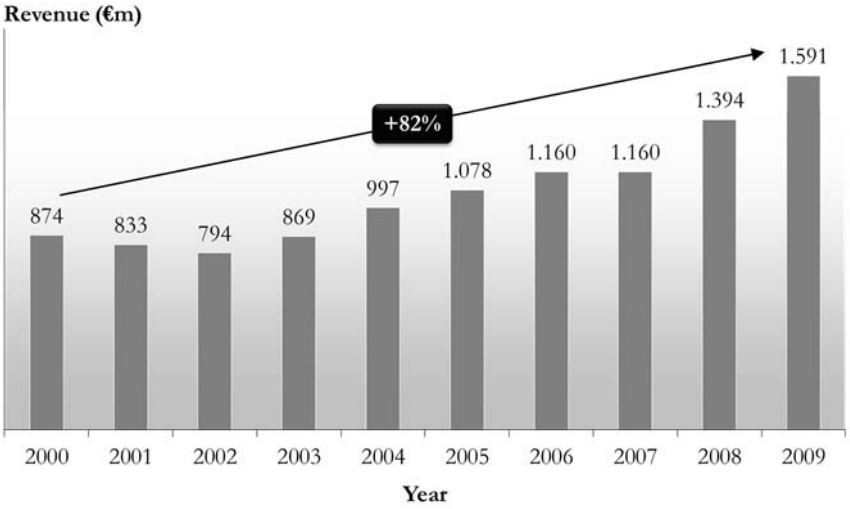
[2] In this article, '$' always refers to the US dollar.

[3] For a history of sound and music in video games see Chan (2007: 6-15) Collins (2005), McDonald (n.d.).

[4] "'…the game doesn't know where the music is, and the music doesn't know where the game is.' He [Michael Pummel, composer] says it is possible to work around this problem, 'but you have to go in and rewrite some pretty high-end source code.'" (Belinkie 1999)

P. Moormann (ed.), *Music and Game,* DOI 10.1007/978-3-531-18913-0_11,

Figure 1: Annual revenue of the games industry in Germany (software only); source: Bundesverband Interaktive Unterhaltungssoftware (2006; 2010)



Today, 16 years after their introduction, many of these problems have downsized. Memory is no longer specified in Megabyte but in Gigabyte. The sound quality of today's games can outrun the Redbook CD-standard of 44.1 kHz by far[5] and being compatible to surround sound-systems is off-the-shelf. Despite that fact, interactive music still is a crucial aspect for gaming technology and the progress within this field is also amazing: in many games, music is a crucial guide for the player's orientation. (Jørgensen 2008) In *Left4Dead* (2008), for example, each mighty enemy boss has his/her own leitmotif, showing the player not only that a fight will come soon, but also the identity of the opponent before he/she comes into sight. Music-based games such as *SingStar* (2004), *Guitar Hero* (2005) or *Rock Band* (2007) have become top selling products all over the world.

However, technological progress as well as increasing competition on the market led to decreasing profit margins for the whole business. In 2008, launching a video game on Xbox 360 required an average investment of $20m (development and marketing costs) (Collins 2008a: 107). Actually only a few games really make a profit, forcing the industry to spread their financial risk (ibid.). One way to reach this goal is to employ a tightened in-sourcing strategy – acquiring developer

[5] E.g. Sony's PlayStation 3 offers a sound resolution up to 176.4 Khz (http://de.playstation.com/ps3/support/music/detail/item225523/Optimales-H%C3%B6rvergn%C3%BCgen/ [05/05/2012])

companies due to cost-cutting synergy effects, as, e.g., Microsoft Game Studios does.[6]

Concerning cost-related issues, music plays a significant role within this context too, since, e.g., producers of so called AAA games, which can be regarded rather as an indicator for the financial effort than as a quality index, calculate up to 10% of their whole development budget for game audio (Paul 2010). But music is not only a cost factor. Despite its influence on the game quality, it can also serve as an instrument for cross-marketing and industry cooperation, thereby minimizing financial risk and offering additional revenue possibilities. To make a long story short: game music has become part of a high-tech billion-dollar-worldwide entertainment business.

2 Composing music for games

Basically, game developers who seek to integrate music into a game have three options:

- Using pre-existing pieces from the free music market which have to be licensed for the game.
- Using music from libraries, which offer comparably cheap licenses for pieces and whose composers are not members of music collecting societies. Musicfox.com is only one example of a website that relates the prices per title to the application, reaching from €35 for flash games to €645 for all applications within one project, including TV-ads.[7]
- Charging a composer with the production of customized music for a game. This customized option will be considered in the following section.[8]

Compared to pre-existing tracks, a customized music production has two major advantages: on the one hand, it is possible to get a very individualistic result that fits into the context and the mood of the game; on the other hand, the aspect of inter-

[6] Some of the acquired companies are Powerhouse Rare Ltd. (2002; developed e.g. *Donkey Kong 64*, 1999), Lionhead Studios (2006; developed e.g. *Fable*, 2004) or Big Park Inc. (2009; developed e.g. *Need for Speed*, 1994). Microsoft (2002; 2006; 2009)

[7] http://www.musicfox.com/info/lizenzen.php [05/05/2012]

[8] Since the economic relation of composers and their clients within the video game industry is not well documented, this section mainly relies on two 1-hour interviews with Michael Stöckemann (European Composers; interview conducted on 01/17/2011) and Martin Straka (Martin Straka Sound Design; interview conducted on 01/14/2011). The author would like to thank both of them for their patience and the information they provided. All interview quotations in this text are translated by the author.

activity especially can require a customized approach: for example, if the layering method is applied to the soundtrack.[9]

Whilst most developer companies have in-house sound designers, only a few employ people who are charged with music production (Collins 2008a: 87). Paul (2010) reports that the average wages for in-house audio jobs start at approximately $40,000 a year and go up to $90,000 a year, depending on job tenure. This can be a risky strategy, at least for smaller developer companies, since the salaries have to be paid continuously and cannot be adjusted to the number of orders. In the worst case, a composer gets paid but has nothing to do. But in-house composers also provide big advantages since they usually know the entire project better than a freelancer. Chris Hülsbeck, who has worked as a composer at several companies[10], emphasized the advantages of such a working environment in a TV-interview:

> "As in-house composer, I have the advantage of being present during the whole game development process. Starting with the first concepts to the first demos, I can see everything. You can look at storyboards, drafts and artwork. And it is there that I get my first musical ideas."[11]

This can be regarded as an ideal constellation for the whole working processes, especially because in most other cases sound and music are considered at a very late stage, diminishing the possibility to use the full potential of the audio level (Collins 2008a: 88).[12] However, most customized music for games is produced by freelancers who also work in other fields (e.g. film or advertising music).[13] Depending on the project, different budgets as well as different team sizes are observable. While at smaller, independent productions, it is common to charge one person with the whole game sound task (see below), e.g. with Sony's *God of War II* (2007), the music team consisted of four composers, three orchestrators, three ensembles, a variety of ethnic soloists, and the development/implementation team (Bajakian 2007; quoted from Collins 2008a: 89), These different working environments also sometimes lead to different payment systems.

A very common way to pay a composer is per music minute. The costs of a total buyout of all music rights then range between $1,000 and $1,500, or even more

[9] Layering basically means that instrument tracks can be added or dropped within a particular piece of music according to the action. For an introduction to non-linear aspects of game sound, see Collins 2007.

[10] Today he is working as a freelancer (see www. http://www.huelsbeck.com/ [05/05/2012]).

[11] Broadcast "neues" on 3sat, 08/17/2008. Interview conducted in German, translation by the author. The video is available at http://www.youtube.com/watch?v=Zy63qODDqSo [05/05/2012]

[12] This actually is not only an issue within the games industry, but rather a common practice among most industries which use music as a design element.

[13] An exception is the German company Dynamedion, which specialized in game music and sound effects production. However, they have also recently worked on other projects such as TV broadcasts (see www.dynamedion.de [05/05/2012]).

per minute of composed music. Assuming an average of 30 music minutes[14], the total bill can easily reach from $30,000 up to $45,000. But a complete soundtrack requires more investment than just paying for a composition. Michael Stöckemann reports that "I generally distinguish between composition and production. This means for composition one charges the price per minute, but music production has to be calculated on its own. For example, if you book an orchestra, you cannot convert this into a minute price basis."

Investing in an orchestra production, which has become a standard for many AAA games, is especially very expensive and also difficult to calculate in advance. Stöckemann (emphasis due to pronunciation) says:

> "The sky's the limit. If I book the London Symphonic, I have to pay through my nose. If I take an orchestra from East Europe, it's not that expensive. It's hard to figure out on a general basis, because the calculation for an orchestra is very complex. Many orchestras bill per musician. Then there is, let's say, a piano tuner; sometimes percussion requires an extra charge. Then the question: 'Do I conduct myself or shall I take their conductor?' And all this flows into the calculation. […] By rule of thumb, I would say *at least* €10,000 per day."

Despite the fact that live recordings are regarded as a pivotal element for game music among many composers and producers, there are also considerations that question their necessity. Elman (2010), for example, only sees three reasons which may justify the effort of live recordings:

> "The score is orchestral and has tons of linear cinematics or music cues. The score is for a music game that requires very realistic sounding performances, as in Guitar Hero. The composer is using instruments in his score that he (or perhaps anyone) cannot properly recreate with sampling and sequencing. For example, it is difficult to digitally replicate acoustic and electric guitars, so it's better to use the real instruments in this situation."

As well as the costs for the client, in many cases the effort for the composer within a project is also very hard to forecast. Although Stöckemann estimates he composes 1-10 minutes of music per day, depending on the required complexity, he acknowledges that the actual working time often takes much longer than the mere composition.

---

[14] According to Michael Stöckemann, 30 minutes is the average time of composed music for a video game at *European Composers*. Depending on the game, this can change significantly. "Typically, [game composer] Michael Pummell produces a piece of music every day. The average game contains 10 to 15 pieces. However, large RPGs may contain dozens of pieces in all possible styles and moods." (Belinkie 1999)

> "This heavily depends on the client. There are clients, saying 'That's great. Do it that way.' But there are also people where you have to revise umpteen times [sic].[15] This also depends on the number of people involved. If you have only one producer in charge, this is much easier compared to 10 guys having a say; if the game is a franchise, the franchisor also influences the process. The more people are involved, the longer it takes."

Additionally, the client's personal taste can lead to a goal conflict, since in the end a composer works primarily for his client and only secondary for the game. In the best cases, both goals are the same. However, according to Stöckemann, "Many people there don't have a clue about music" but decide on the game soundtrack by basically relying on personal musical taste and then "You sometimes have to advise against a certain use and say, 'This doesn't fit. Take something else.'" The reaction to such an objection differs. Sometimes the client trusts the music expert and accepts his counterproposal but sometimes personal taste overrules. Stöckemann has even rejected jobs due to this conflict (not yet within the game industry, but in other fields). The reason for such a reaction lies within long-term goals: "In the end your name will be connected with the music and nobody asks about the production environment. People only see that this guy made that music and it's trash. So I don't do myself any favors."

Thus, the relation between composer and client relies heavily on mutual confidence since on the client's side there are usually no music experts, which impedes proper communication. However, Stöckemann acknowledges that the few exceptions of music experts as contact points on the client's side prove to be very effective for the development process as well as for the results.

> "If developer companies have a musicologist sitting there as contact person, that's super. You know there is someone who really has a clue about music. And then communication of course is much easier. […] I know a German company which employs a musicologist and, strangely enough, they always have noticeably super soundtracks in their games. […] But overall, it's very rare that there are musically educated people."

Within the independent sector, not only the salaries, but also the whole production effort is quite low because the whole business is usually based on a low revenue level. Composer Martin Straka reports about his recent work on an iPad/iPhone/iPod game which was sold about 250 times a day, in peak periods more than 1,000 times. This really successful independent game generated about €40,000 profit within ten to twelve weeks.[16] This figure even does not include, e.g., HR

[15] Usually the price per music minute includes two revisions. Additional revisions incur an extra charge.

[16] A very detailed overview of the revenue development of another *iPod* game *Solipskier* (2010, $80,000 within two months) can be found here: http://mikengreg.com/blog/2010/10/2-months-of-solipskier-app-store-sales/ [05/05/2012].

development costs, which were about 2.5 man-years. This is simply not comparable to the dimensions of AAA games. Thus, some composers for independent games also apply different payment models. Straka explains:

> "Usually I don't calculate with price-per-music-minute. I always try to reckon the number of working days in advance: how many eight-hour working days will I need? The daily rate is comparable to the one of a freelance-designer. Then we [he and his client] decide on a flat charge. And we also write down in the contract how many revisions I will do, at most two. Additional revisions will incur an extra charge, but this actually happens very rarely."

This flat charge also includes the costs for production, which for considerable reasons, is not as expensive as with AAA games: when a game makes a profit of €40,000 within one and a half months, it simply does not pay off to engage an orchestra for €10,000 per day. The costs for composition also have to be considerably lower due to the low budgets. But, as compensation, the composer often gets an additional variable salary component. Straka says, "It is quite common that I additionally get paid a bonus related to sales numbers. And here people are much more flexible; there is a lot of room to negotiate. With some projects, the share can be 30-40% up to an absolute limit."

This can sometimes be a very interesting option for a composer, especially if a game is expected to become a top seller. Within the independent sector, many success stories underline the interest in such contract conditions and can serve as a good incentive. Straka, for example, says that there have been rumours that the innovative puzzle game *Crayon Physics* (2007) from the Finnish developer Petri Purho generated $300,000 revenue within one weekend. The indie game *Minecraft* (2009) even topped this figure by generating a profit (not revenue!) of $350,000 within one day.[17] "If I have the feeling that a game will be really cool, I always try to get at least a small share. This can be really interesting. And if you miss such a top seller and sell your music for just €2,000, you'll be hopping mad."

Another important topic within the relation of composers and clients is the legal issue concerning the music's intellectual property. Despite the fact that, especially in the USA, a total buyout is the standard case, not all composers give a flat license for their music. Stöckemann reports:

> "We don't do that. We reserve the secondary usage rights for ourselves by default. […] However, with larger game licensing contracts, it often is the case that they insist on the secondary usage rights. Then you have to find a compromise. If they say, for example, 'We want to publish the soundtrack', you have to insist on a certain share. You also can limit the license to a certain time-frame. In the end it always depends on the product. In

[17] http://www.pcgames.de/Valve-Software-Firma-15833/News/Minecraft-Markus-Persson-verdiente-350000-US-Dollar-an-einem-Tag-776243/ [05/05/2012].

> cases where the game will be sold worldwide, I don't have any problems if they also want to publish the soundtrack, because I benefit from that, too. But if it's just such a medium-sized thing, it is advisable to reserve the rights for yourself."

This issue is closely related to that of the collecting societies such as the ASCAP (American Society of Composers), whose German counterpart is GEMA.[18] The GEMA tariffs a publisher would have to pay can be considerably high. E.g., if we consider a game, published on DVD, assuming the average 30 minutes of game music, the minimum fee is €0.25 + 7% taxes per copy (GEMA 2010: 3).[19] This means that the publisher of a blockbuster game, selling 100,000 DVD copies during one month, would have to pay at least a €26,750 GEMA fee for this time frame.[20] This has led to the practice that GEMA-dutiable soundtrack compositions are not contracted within the games business. Both Michael Stöckemann and Martin Straka confirmed this as a standard within the entire business. In the end, this is somehow a paradoxical situation: although GEMA presents itself as an 'organization to protect the creative human being'[21], which ensures the 'livelihood'[22] of music creators, German game composers at least wouldn't actually have an income if their soundtracks were GEMA-dutiable.[23] As Straka argues, a composer would not be competitive as developers could easily switch to other composers or use GEMA-free music libraries. Stöckemann acknowledges that a game composer either has not to be a GEMA member or has to exclude the respective rights from the GEMA contract:

> "Box-games [i.e. games on CD/DVD] at GEMA are audiovisual storage devices; this means they are within the same category as film DVDs. And then each composer has to calculate on his own: Do I make money with DVDs? And we excluded that, to be able to make box-games."

Today a professional relation between composers and developer teams appears in nearly all segments of the game business. However, the requirements as well as contracting and salary conditions change significantly depending on the size and sort of the project, team structure and, of course, budgets. Especially due to the dynamics, complexity and differences among the (music and) games market, it has

[18] GEMA stands for "Gesellschaft für musikalische Aufführungs- und mechanische Vervielfältigungsrechte" (Association for legal rights of music performance and mechanical reproduction).

[19] The GEMA fees actually relate to the minutes of music on the storage device and the price of the product. This minimum fee is a threshold within this model, which has to be paid, even if the game is for free.

[20] For a similar calculation concerning the Finnish organization Taesto, see Kärjä 2008: 39.

[21] https://www.gema.de/musikurheber/10-fragen-10-antworten.html [05/05/2012]; translation by the author.

[22] Ibid.

[23] Whilst GEMA insists on fees for game music, the Finnish Taesto 'instead of 'clubbing' their clients, […] decided to withdraw from licensing music for games altogether." (Kärjä 2008: 40)

become impossible to estimate concrete numbers for the whole business or to know how much investment and effort it takes to develop a customized game soundtrack. The amounts reach from a few to hundreds of thousands of Euros. But obviously customized music is demanded on each level of the games industry and is – compared to the pre-produced library music – the preferred option. If we consider the above-described market growth, it is likely that composing music for games will become an increasing part of the composers' profession.

Concerning the communication issue, it would be advisable to employ musically-educated people, at least within larger projects, as a contact point for composers to ease the work and improve results. However, it is questionable if this will actually become a standard. As Michael Stöckemann puts it, "If one looks back into the history of commissioned composition, including the movies, then one recognizes that it's always been the case that the people who decided on the music to a large extent knew nothing about it."

3 Cross-industry relations

The growing games market also attracts other industries, and consumers encounter many of them while playing a game today. The various versions of the racing game *Need for Speed,* for example, feature not only cars from manufacturers like BMW, Mercedes or Porsche, but also branded tuning-gear as well as lots of billboards, logos, etc. along the racetracks. In-game-advertising (IGA) has become an important marketing tool, as the share of games in terms of media consumption time is very high. Tessler (2008: 14) reports that "Americans, on average, spend about 75 hours more per year playing games than they do watching rented video/DVDs, watching television or listening to the radio." The estimated overall global value of IGA business for 2011 is close to $2bn. (iResearch 2008; quoted from Chang et al. 2010: 63)

But IGA is not a matter of just placing logos or products in a game; it is also a question of integrating it in an appropriate way. Wrong application can damage the gaming experience as well as the advertising brand's image.[24] Chang et al. (2010) empirically confirmed the assumption that not only prominence, but also, in particular, the integration and congruency of IGA are the most crucial aspects for effectiveness regarding acceptance as well as purchase intention. Since brands are a common part of everyday life, many games offer possibilities for a plausible and congruent integration which ideally also supports the sense of realism of a game. (Brand 2006) To give an extreme example: it would not be advisable to place a car

[24] See e.g. http://gamedelight.tumblr.com/post/5153559 05/unsinniges-product-placement-in-metal-gear-solid [05/05/2012]

brand within a fantasy role-playing game like *World of Warcraft* (2004), while, on the other hand, *Need for Speed* would lose much of its fascination if only fantasy car brands appeared.

An interrelation between music and the games industry was already observable in the 1980s when popular music was used in games. Due to the limited technology, these pieces were not played in their original versions, but adapted by audio engineers. But, nevertheless, they appeared within the game. Sometimes avatars of the musicians were part of the game, e.g., the band Journey in the game *Journey's Escape* (1982) (Belinkie 1999; Collins 2008a: 111-113). Popular musicians such as Brian May for *Rise of the Robots* (1994) also composed music for games (Collins 2008a: 113). These basic options have still not changed, and Collins (2008a: 111) accordingly separates the association of music and games into three basic categories: "popular music or musicians as the subject or narrative component of a game, popular musicians as composers for games, and the use of licensed popular music in games."

However something has changed: promoting music and musicians in games has become common practice. "[I]n fact, it is almost at the point where it would be unusual for a hit game to be released by a major developer that does not have a popular artist involved in its soundtrack." (Collins 2008a: 115) From the music industry's perspective, the reasons for such an involvement are obvious if we, e.g., consider the "Guitar Hero effect":[25]

> "Sales of Metallica's *One* increased from just more than 2,000 weekly before *GH III*'s [i.e. *Guitar Hero III*, 2007] release to more than 6,000 in the weeks afterward and spiked at 27,605 in the post-holiday week. Muse and the Chili Peppers saw similar but more modest hikes in sales of *Knights of Cydonia* and *Suck My Kiss*. 'Those tracks didn't have any (other) activity surrounding them at the time,' Reiter [i.e. Mark Reiter, Q Prime management] says. 'I really do believe we have only begun to scratch the surface of the impact video games can have on artists and instrument sales.'"

Actually, not only sales figures, but also other statistics are very promising. As Tessler (2008: 17) mentions, an average game, not music-based, is played by 2.5 people, each playing 50 hours and one song pops up about twice an hour. This frequency of contact is not even achieved by a heavy broadcasting rotation on radio or MTV. Surveys reveal that between 22% (NPD 2008) and 49% (Tessler 2008: 17)[26] of gamers have at least once bought music they got to know through playing a game. Are games thus the silver bullet of the music industry against the 'internet', 'file sharing software' and 'unauthorized copying' werewolves?

[25] http://www.usatoday.com/tech/gaming/2008-02-14-guitar-hero-effect_N.htm [05/05/2012]
[26] Collins (2008a: 115): 27%

In some cases this may be true, but the bullets sometimes miss the target and counter-fire also plays a significant role because games and the music industry are also competitors on the entertainment market: while playing games, people do not consume purchased music.[27] This of course changes when players can listen to their own music during a game, which is possible on many platforms today but depends on the game (if users do not simply turn off the game sound and switch on their stereo). However, this is lost advertising time, since people do not get in touch with the game soundtrack at all. Furthermore there are no guarantees of increasing sales by just placing music in a game, even if it is a top seller. For example, the first edition of *Grand Theft Auto* (*GTA,* 1997), as well as its soundtrack, sold very well. A sequel title, *Grand Theft Auto: Vice City* (2002), also was a top seller (more than 8m copies) but the music's collection only sold 30,135 copies worldwide (Tessler 2008: 24).

If we consider the above mentioned criteria, the music in *GTA* should have been a success. It is presented prominently, congruent to the historical background of the game, and is also well integrated into the action since it is being played by a 'diegetic'[28] source in the game. A possible reason for the soundtrack's flop might be a mismatch of music styles and target groups. Since the game plays in the 1980s, the music consists of pieces of popular music from this decade and appears on radio stations while the avatar is driving (stolen) cars.[29] The game was released in 2002 and, according to a survey by Nielsen (2008), the major proportion of *GTA*-players is between 18 and 24 years old. Thus (putting it mildly) they were probably not wowed by 1980s music at that time – they already knew it inside out from their childhood. This was also underlined by reviews of the game, where one major point of criticism was that "[r]adio stations get pretty tiresome".[30] The target group's motivation to buy a boring soundtrack is understandably low and this clearly shows one significant difference to other forms of IGA: music IGA from a player's perspective already means consuming the product. If the goal of subsequent purchase is to be reached, IGA has to create a need for repeating the music consumption. If the consumption experience in the game was disappointing, the need for repetition will probably stay low.

This clearly shows that implementation into a game also plays a crucial role for music IGA, even though there are significant differences in the placement of (other) products or brands. Congruency (in the sense that the music has to match the mood

[27] This issue already was addressed in the early 1980s (Belinkie 1999).

[28] There are considerable reasons to be sceptical about using the term 'diegesis' in connection to games, as, e.g., Jørgensen (2011) acknowledges. However, in her terminology, the radio within *GTA* would be an 'iconic interface sound', which is closest to the diegetic sound category of film analysis (ibid: 93).

[29] A list of the titles which are played on the several in-game radio stations can be found here: http://de.gta.wikia.com/wiki/Vice_City_Soundtrack [05/05/2012].

[30] http://www.gtavice.com/ [05/05/2012]

of the game) is especially very important since music that cuts down the gaming experience damages the game as well as the demand for the music (e.g. imagine a bluegrass promotion in the *Heroes of Might and Magic* series, 1996). Whilst Steve Schnur from Electronic Arts (EA) asserts that "we have to find the right music; it sets the right environment, it sets the right mood"[31], Collins (2008a: 116) reports that it is also not unusual that people in the games industry "see the use of their games as a way to promote bands that they enjoy". In the end, this can be risky due to the above-mentioned issue of personal taste overruling an appropriate implementation.

However, while for other products and brands integration into the game is very important (in the sense that the product's mere presence has to be accepted), this is basically no problem with music. Use of music is a common practice anyway, and a developer is not forced to establish a reason for playing music to a cut scene, the main menu or when the game is paused. Of course the extent of possibilities to implement linear pieces of music also depends on the game type: e.g. a racing game will provide more room for linear background music than a role-playing game where the music has to change according to the action (Collins 2008a: 119). But, in principle, each game offers at least some possibilities for music IGA without irritating the player.

This ease of integration might be a main reason for game publishers getting involved particularly in the music industry. Back in 2002, the mutual relationship between games and the music industry had already reached a dimension "which resembles the relationship of radio and the music industry." (Schotzger 2002) A major player within this field is Electronic Arts.[32] In 2002, EA Trax was founded as an independent institution to integrate licensed music from music acts into EA games. In 2004, EA and Cherry Lane Music founded a joint venture called Next Level Music, which produced music aiming to seize the marketing opportunities of EA's games. In 2005, EA then intensified its efforts concerning music distribution by the launch of EA Recordings, which aimed to provide music from EA game titles on a broad range of retail websites. In principle, EA does not differ any more from a common record company (despite its game focus) since it comprises the whole music production and distribution chain. From the music business perspective, EA's games are then basically a marketing platform for self-distributed music. Tessler (2008: 25, original emphasis) even argues that EAis "*a* new MTV, if not necessarily *the* new MTV." However, until now (as far as the author's research

[31] Interview with Steve Schnur, Worldwide Executive Music and Music Marketing at Electronic Arts on http://www.artistshousemusic.org/videos/steve+schnur+of+ea+games [05/05/2012]. A short genre-theory-based explanation is provided by Kärjä 2008: 33.

[32] For a more detailed description of EA's activities in the music market see Tessler (2008); interview with Steve Schnur, Worldwide Executive Music and Music Marketing at Electronic Arts on http://www.artistshousemusic.org/videos/steve+schnur+of+ea+games [05/05/2012]

could reveal), the most obvious distribution channel is not yet in use, since as nearly all gaming platforms possess an internet connection, offering the opportunity for in-game music purchase would be the next logical step. So it is imaginable that some of the next generation platforms attach a 'get the track' button to the controller so that the player can buy a currently played song, which would considerably diminish inhibition thresholds for purchasing, and could also be a good monitoring tool for IGA effectiveness.

Despite this clearly observable involvement of the games industry in the music business, it cannot be concluded that market power is allocated only on the games side.[33] As in many other cases, 'synergy'[34] is the main buzzword. Because of the decreasing margins, the gaming industry also seeks for integration into other intellectual properties such as movies[35] or music in order to spread risk and gain marketing effectiveness.[36] Music and musicians are thus also needed for game marketing purposes. This is not only restricted to celebrities promoting games, such as Ozzy Osbourne in a TV ad for *World of Warcraft*, composing for games or appearing as avatars. How far these connections actually can go shows in the game *50 Cent: Bulletproof* (2005), since it offers exclusive material (music and videos) which is only available in the game. In this case, the whole game was conceptualized "with the attention […] on the marketing power of celebrities."(Collins 2008a: 112)

The above-mentioned considerations dealt implicitly with integrating music as a more or less background feature of games. But the interrelations become significantly closer if we consider a trend on the gaming market that occurred during recent years: music-based games. A press release of the NPD Group (2008) stated that "the music and dance genre was the best-selling genre in video games, representing 16 percent of total software sales for the year". In 2007, five versions of *Guitar Hero* were among the 20 top-selling games in the US.[37] In those cases the synergy effects as well as the mutual dependence of both industries become highly visible.

The 'Guitar Hero' effect of course arouses huge interest among the music industry, which is still struggling in the highly-competitive entertainment market. Music-based games provide another access to the music since players really have to concentrate (at least, partly) on the music, which is not the case when they listen to a *GTA* car radio. It is very likely that coping intensively with the music and getting a

[33] This is already obvious considering financial risk taking. While music in most cases is only of secondary importance, the music industry, on the other hand, does not have to invest in new infrastructure and thus, in the end, is rather on the beneficial side of cross-promotional deals (Kärjä 2008: 35).

[34] See also Collins 2008a: 107-122; Kärjä 2008: 30-32

[35] When games are released in connection to movies, the film soundtrack is also adapted in most cases (see e.g. the various *Star Wars* games since 1983).

[36] Concerning the role of music in movie-related games, see e.g. Boyd 2003.

[37] Figures refer to sales per platform. In 2008 there were still three versions among the top 20. In 2009 the game had fallen out of the top 20. (entertainment software association 2008: 6; 2009: 8; 2010: 8).

sense of playing might be the major reason for the IGA effectiveness in those games (although this also may mean that a particular player dislikes a particular song).

From the games industry's perspective, licensed music is not of the same importance for all music-based games. E.g. most tracks of the *Dance Dance Revolution* series (since 1998) were written by the developer/publisher company's (Konami's) in-house composers.[38] However, games that (in)directly deal with music making, such as *SingStar* or *Rock Band,* rely heavily on licensed music. I would suggest that here a 'realness' effect comes into play. Just as in the case of *Need for Speed* cars, it seems to be more appealing to a player if the game simulates making pre-existing music from 'real' musicians. This is also underlined by another aspect: while karaoke games employ licensed music from many popular music genres where the voice of the singer sometimes seems to be the only human performance, instrumental games especially make use of the rock and metal genre. These genres are very closely bound to the ideology that all music has to be handmade and that the musicians can really play the songs, a cultural phenomenon which, according to Auslander (2008: 74-85), belongs to the discourse of rock authenticity. The fact that those kinds of games particularly refer to the playing skills of musicians and not just to their popularity is shown by the example of the speed/power metal band Dragonforce*,* which gained its worldwide popularity basically due to *Guitar Hero III*.[39] Their song *Through the Fire and Flames,* which is the most difficult one to play in the game, was added as a bonus track. Also in 'real life', the band's music is characterized in particular by the musicians' skills and, especially, by the speed of playing.[40]

This sense of realism also provides possibilities for other music-related industries, in particular, manufacturers and dealers of musical equipment, to attend to the marketing machinery of music-based gaming. In *Guitar Hero III,* music equipment not only appears within the game but the controllers are also shaped like real instruments. Even the strategies of employing celebrities as endorsers are implemented. E.g. former Guns N' Roses guitarist Slash nearly exclusively played Gibson Les Paul during his whole career and, since 1998, Gibson also offers a signed model

[38] Interview with Naoki Maeda and Kenichi Miyaji (http://www.gamezone.de/specials_detail.asp?id=254 [05/05/2012])

[39] See e.g. the interview with *Dragonforce* guitarist Herman Li on http://www.starpulse.com/Music/Draforce/Videos/?vxChannel=Music+News&vxClipId=938400&clip_id=&video_title=Dragonforce+Guitar+Hero+Vs+Real+Guitar+-+video [05/05/2012]. However, this also connected the band very closely to the game, so that the group today puts much effort on emphasizing that they are 'real' musicians and not a mere video game phenomenon (http://www.gamezone.de/news_detail.asp?nid=67228 [05/05/2012]). E.g. the term 'guitar hero' does not appear in the biography on the band's website (http://www.dragonforce.com/biography/ [05/05/2012]).

[40] This is also displayed by the music video of *Through the Fire and Flames*, which shows additional close-up frames of the guitarists' fretboards during the solos, which usually is a feature of educational guitar videos.

of the guitar. Consequently the avatar[41] of Slash appearing in the game also plays a Gibson Les Paul. Additionally, the shape of the controller is an important marketing parameter (although the manufacturer's brand does not appear on it), which is also displayed by the enormous bandwidth of controllers imitating different guitars.[42]

The importance of music equipment advertising is also shown by a recent lawsuit (2008/2009) between guitar manufacturer Gibson and *Guitar Hero III* publisher Activision. Gibson filed against Activision since the guitar company had a patent for a technology simulating a musical performance. Notwithstanding the court's decision (Gibson lost in March 2009), the timing of Gibson's action is remarkable: "Gibson waited three years to make its patent allegations and only did so after it became clear that Activision was not interested in renewing its marketing and support agreement with Gibson." (Activision 2008) Despite the fact that this quotation is taken from an Activision press release, the mere fact that this certainly counts as an argument shows how important these deals have become for instrument manufacturers.

The effectiveness of IGA for music instruments and equipment in music games is also underlined by a survey among *Guitar Hero* and *Rock Band* players which was published in 2008 by the wholesaler Guitar Center. It showed that 67% of players who did not play a musical instrument said that it would be likely that they would start playing within the next two years. The study also revealed a significant correlation between game sales and sales of beginner equipment in Guitar Center stores, which increased by 20.7% in the last quarter of 2007 and by 26.9% during the first nine months of 2008.[43]

Music-based games thus not only seem to be capable of arousing interest in playing a musical instrument, but also of generating preferences for equipment brands – very similar to the marketing mechanism manufacturers have aimed at for decades with endorsement contracts.

But it seems to be questionable if the development of music games will continue at its present speed. Despite the fact that the potential seems to be huge, sales figures today diminish euphoria. At the time this article was written (i.e. February 2011), Activision published the following: "[…] due to continued declines in the music genre, the company will disband Activision Publishing's Guitar Hero business unit and discontinue development on its Guitar Hero game for 2011." (Activision Blizzard 2011) At nearly the same time, *Guitar Hero* developer Harmonix

[41] The avatars in the game can be unlocked, but not just for performing the songs of their human counterpart, but also songs from other artists. This is one of the major reasons why some artists reject the appearance of their avatar in a game, such as Jon Bon Jovi, or, as it became apparent in the conflict between Activision and Courtney Love, concerning the appearance of Kurt Cobain's avatar in *Guitar Hero* (see e.g. Bailey 2009).

[42] There is also a huge number of skins available to optically individualize the controller (e.g. http://guitarheroskins.blogspot.com/ [05/05/2012])

[43] Study results quoted from Berardini 2008

stated that the company would have to dismiss 12-15% of their employees due to the "current product development plans" (quoted from Gilbert 2011). Asked about the future of their involvement in music games, Activision responded: "Over the past two years, we have seen rapid declines in the music genre, and unfortunately, based on current demand, we simply cannot continue to profitably make these games given the considerable licensing and manufacturing costs." (quoted from Grant 2011)

However, at least music licensing costs seem not to be the main reason for this decision. First of all the costs were not higher than for usual background music licenses. In 2008, Warner Music Group (obviously ignoring the impact of music games on music sales) even bemoaned the fact that the licensing fees would be far too low for a major game content (Briegleb 2008).[44] Secondly, it seems odd that Activision and Harmonix promise to continue offering new song material for their music games,[45] which would be an economic Kamikaze operation if licensing costs endangered profit. The main reason seems rather to be the decline in sales figures, which is partly home-made: "The dynamics of the game changed little from one title to the next." (Taylor 2011) So why should a consumer purchase a rather expensive game if he gets no new gaming experience from an annually-released new version of the same game? A high price level, an oversaturated market and, especially, a low degree of innovation seem to be the key factors for this development.

The main driver of this market, I would suggest, is innovation towards real music making. "At a certain stage, users are going to be more interested in picking up a real guitar." (Taylor 2011) This was already foreshadowed by a recent game release: on October 19th 2010, *Power Gig – Rise of the Six String* introduced a fully-functioning electric guitar as a controller.[46] Although some reviews evaluate the game as rather disappointing, the main source of this disappointment is remarkable: "It [the game] will not, *cannot* teach you to play guitar." (McElroy 2010, original emphasis) Obviously there is a demand to 'really' play music in music games. Ten days after the release of *Power Gig,* this next step was approached with the release of *Rock Band 3* (2010)*,* which offers a (Fender-Mustang-shaped) controller with six strings, and gets closer to real guitar playing since, depending on the difficulty level, it requires actually playing the correct notes, which is not yet the case with *Power Gig* (Schiesel 2010). In the end, this only leaves very little doubt that the line of

[44] The absolute amount depends on the licensing contract and sales figures (see section 'composing for video games'). For a *Guitar Hero* game, offering up to 70 songs, this surely is several million dollars. However, this is a quite low figure if one considers that the global revenue of the music games genre is displayed in billions of dollars. Again, a strategy to overcome those disputes seems to lie in an amalgamation of the music and games industry within large entertainment enterprises: in 2008, Universal's parent company Vivendi simply bought Activision (Vivendi 2008).

[45] http://www.musikmarkt.de/Aktuell/News/News/Activision-verabschiedet-sich-von-Guitar-Hero-Donnerstag-10.-Februar-2011 [05/05/2012]

[46] http://www.powergig.com/ [05/05/2012]

distinction between playing and gaming music will be increasingly blurred in the future (e.g. by integrating more educational aspects into the game play or providing recording technology with a game).

A future increasing amalgamation of the music and game industry is indicated by the above-mentioned considerations, although the expectations, especially concerning the speed, should be viewed relatively. At the moment it is hard to forecast the intensity of this amalgamation as well as future business models, since this (just like the past) depends heavily on consumer demand as well as on technological progress (e.g. who develops which patents) and developments within each of the related industry sectors. Last but not least, it is also a question of 'who needs whom how much?' In terms of this issue, it rather looks today as if the game industry – despite some economic setbacks – is in the best position to become the leader in future joint ventures due to its still growing importance within the whole entertainment business.

4 Original game scores

Koji Kondo, Nobuo Uematsu and Yasunori Mitsuda – in Japan these names could compete with Anastacia, Bon Jovi or Britney Spears in terms of popularity. Their owners are video game composers, who actually are superstars in Japan. Belinkie (1999) has already reported that video game music in Japan reaches top rankings in sales charts and that game music concerts are overcrowded. Despite the fact that most people in the US or Europe may surely know the *Super Mario* tunes, their composer, Koji Kondo, is almost completely unknown outside the gaming scene. This clearly shows that original video game music (until now) has a significantly different status among the so-called western cultures.

Ventures like EA's activities in the music market (see above) are rather focused on selling licensed pre-existing music which is not primarily conceptualized as game music.[47] However, the effort put into marketing original game scores is not even close to those ventures. The reason for that is not that video game soundtracks are not published. As Michael Stöckemann puts it: "Meanwhile many soundtracks are published but not to the public. Nobody knows them. The pieces are put on iTunes and Co. but then they don't communicate it and that's no use."[48]

[47] Obviously it is not that easy to draw a distinction line between both genres. Kärjä (2008: 33) discusses this issue in relation to the song *Late Goodbye*, written by Poets of the Fall for *Max Payne 2* (2003): "[I]t could be argued that Poets of the Fall acted as composers. […] the fact that the song obeys the conventions of 'western' popular music in its strophic form and centrality of lyrics suggests that it can be interpreted more or less as a separate entity within the game."

[48] Of course there also are exceptions. E.g. the *Halo 2* (2004) soundtrack featured remixes by popular artists such as Incubus or Breaking Benjamin (see Collins 2008a: 114).

But there seems to be a demand. As in Japan, there are increasing numbers of game music performances also observable in Europe and the US. The WDR Rundfunkorchester, a German broadcasting station's classical orchestra, integrated game music as a fixture of its annual programme due to the huge success, in terms of audience, of the game music concerts in recent years. A steadily growing remixing and chiptune[49] scene developed. Bands like the Danish group Press Play on Tape play rearranged game music (in their case, games from Commodore 64[50]). On the independent music and games market this trend becomes especially apparent. Game soundtracks today sometimes even outsell other titles on independent music download portals. However, this phenomenon also might be reasoned by the independent scene's mentality, as the owners of the portal *bandcamp.com* suggest while discussing this topic in their blog:

> "We suspect the answer is pretty simple. Gamers, like any artist's fan base, are a passionate community, and when given the opportunity to support the creators of the music they love (and when the relationship is clearly a direct one with the artist), they jump at the chance. […] Many people are undoubtedly buying the music to get the music, but a large proportion are most likely buying it to tell composers […] 'Hey, we love what you're doing and we want you to keep doing it.'"[51]

If we consider the music market on a larger scale, it is not very likely that most consumers' buying motive will be donating to or supporting beloved composers. If this trend should manifest itself outside the independent community, the motive "buying the music to get the music" has to outweigh the support motive by far.

However, the composer Stöckemann is very optimistic in terms of future business development concerning original game scores. He is also a live performer of remixed video game music and says that he and his colleague Filipp Issa expect their number of booking requests to rise by about 50%.[52] They have also produced a sampler with game music remixes called *Sound of Games Vol. 1,* which will be followed soon, as the name suggests, by a successor. "I think it won't last very long until game music has the same status as film music. Just as people buy film music [today], […] people will naturally start buying game soundtracks. The market definitely exists."[53]

---

[49] Chiptuners use the sound technology of early video game hardware to create their own music.

[50] See http://www.pressplayontape.com/ [05/05/2012]

[51] http://blog.bandcamp.com/2011/01/13/game-soundtracks-as-record-industry-bellwether-also-furries / [05/05/2012]

[52] ~20 in 2010 to ~30 in 2011.

[53] This hope already was mentioned in the late 1990s by the music industry. Lee Trink, product manager at Atlantic Records, stated in 1998: "The same way that movie soundtracks have come into their own, and you can scarcely find a film without a soundtrack, is kind of what we're hoping to achieve [with game soundtracks]." (quoted in Belinkie 1999)

If that is the case, why do game companies only very rarely invest in the marketing of original game scores? One aspect might be that the video game business today is an established part of the entertainment industry with fixed organizational structures on the publishing level and that it takes a long time to change structures, especially in the minds of responsible parties. But there is also another aspect that seems to play a role: when AAA titles struggle with margins due to high development costs, it is very risky, from a producer's perspective, to provide additional marketing budgets. The popularity and success of original game scores in this case are mainly based on the sales figures of the game and, if the game flops, two marketing budgets are sunk. However, it would then be an appropriate strategy to apply a delayed marketing campaign for the music until it becomes clear whether the game is selling rather well or poorly, which, in most cases, becomes obvious a few weeks after its release.

Concerning original game scores, most western companies seem to regard them basically as a mood-influencing background feature of the game, which of course was, and still is, their main function. But this conceptualization also might be an obstacle on the way to a soundtrack's popularity as Stöckemann suggests:

> "There are too few things which are really melodic. Many pieces tootle in the background and I don't want to listen to them later on. And this often is a mistake of game companies that they are not focused on doing something melodic. This would increase the quality of the game and would also direct attention to the soundtrack and, to that effect, one could make some additional revenue with it. But obviously this is not requested."

This is also underlined by again drawing a parallel with successful movie soundtracks (in terms of sales). *Bodyguard*, *Titanic* or the various *James Bond* title themes were conceptualized as songs compatible to the listening habits of popular music culture. Also many popular instrumental movie scores, such as the *Star Wars* or *Indiana Jones* title themes, fit at least roughly into this scheme. If original game music is to be marketed, it has to match the listening expectations of the market concerning mere music consumption, which only change very slowly. In the end, it is the same as with music IGA: original game music has to create a need for repetition to be economically successful on its own.

Despite these obstacles, it is highly probable that original video game scores will gain increasing popularity and maybe settle down at the present level of movie scores. It is even imaginable that in a few years we will see an increasing number of game soundtracks in top ten sales charts.[54] But due to the requirements of listening habits, those success stories will be told rather in the field of licensed music ventures than in that concerning original game composition for one simple reason:

[54] The first 'success story' of the Finnish band Poets of the Fall is documented by Kärjä 2008.

original game music then would have to become a chimera since it has to fit two consumption environments – gaming and mere listening.

5 Conclusion and crystal ball gazing

In many fields of the music business, the development of the video game industry has become an important aspect. If the growth of the gaming market continues (and up to now it is hard to identify boundaries), it is very likely that composing for games will not only become an established part of the portfolio of most freelancers, but also the number of game music specialists will increase. Different contracting conditions will probably remain a fixed part of the business since there are no hints that in the near future the demand for smaller mobile games, e.g. on cell phones, will decrease. Thus the gaming business with low revenue levels and correlatively small budgets will also be a working field for game composers. But although the business is performing globally, local aspects also play a significant role: for example, if one considers the different tariffs of collecting societies. It would be interesting to see in future research whether the economic influence of such local differences is relatively marginal or not.

Today cross-industry relations are definitely not exceptions but well established. The driving power behind this is mainly marketing-related expectations. Both – the music and the game industry – are interested in the benefits they can derive from their counterpart, so that joint ventures aiming at synergy effects will probably remain a fixed part of the business, or even increase if one considers, in particular, the development that can be expected in music-based gaming. Concerning the effectiveness of IGA for music as well as the effectiveness of the cross-industry relations of music and video games, there is virtually no research literature available. As the above-mentioned examples show, those deals can be real sales drivers, but can also fail to spur purchase intentions. Actually one knows nearly nothing about the success factors for integrated music and game marketing – simply juxtaposing both without addressing, e.g., questions of matching target groups tastes, consumption habits or a game's mood obviously is not sufficient. This requires future research which also takes the experiential level of consuming music and games into consideration.[55] This is underlined by Kärjä (2008: 36), who states that "analysts should be cautious of models that emphasize the role of conglomerate structures. Instead, it may very well be that various activities associated with fandom are the most 'innovative'".

It is also very likely that original game scores will gain more popularity in the near future and approximately reach the level of film soundtracks. However, one

[55] See for a first approach to this topic Collins 2008a: 117-121.

should be careful with predicting a similar level of popularity in 'western' cultures compared to Japan: although gaming has become a mass phenomenon, the popularity of game music increases rather slowly in Europe and the US. This, as well, could be an interesting question for future research and help understand the underlying cultural mechanisms for marketing effectiveness.[56]

While most of this paper dealt with the counterinfluence of the music industry and games, the increasing economic importance of video games might also be able to affect popular music itself. Since music has always been influenced by technical developments, e.g. the invention of the single record, this possibility cannot be dismissed. The need to match the non-linear nature of video games might become especially influential or, as Collins (2008a: 119) puts it, "Might the song structure of popular music soon adjust to the needs of the gaming industry?" In terms of sound, the influence of the video games industry on music has already appeared. E.g. in an interview, the German rapper Sido (quoted from Jakobs 2009; translation by the author) described his first approaches to music and the development of his musical style:

> "When I started and didn't have no money, I made my beats on the Playstation […] There was a software on the Playstation, called Music Maker. We just had no other choice than taking the Music Maker sounds, which were […] very electric. Then we thought, ok, let's make a new style; we will do this electro-stuff."

Despite the fact that the influence of games on music is likely to increase, a big counterinfluence of popular music culture on games is already highly visible today: games like *Guitar Hero*, *Brütal Legend* or *SingStar* would not have been possible if they had not adapted popular music and their cultural discourses. If it turns out for game publishers and developers that games which employ such strategies are likely to become top sellers, it could also be possible that due to the economic pressure, at least within a closely music-related genre, game structures are developed according to musical needs.

In the end, the economic relations in the field of music and games are – just as in the whole industry – characterized by high dynamics. Many stakeholders have literally entered the game and are influencing the whole system, which again depends on innovations, technological and cultural influences. Thus, the music and games industry relations may probably look significantly different in ten years. Although I have tried to forecast some possible developments, particularly within this field, I would point to Mark Twain: "Predictions are very difficult, especially when the future is involved."

---

[56] Belinkie (1999) acknowledges that the whole phenomenon of gaming in Japan never was considered to be just entertainment for kids, which could also explain the broader acceptance as well as interest in game music.

6 Bibliography

Activision (2008): Activision Responds to Gibson Guitar Corporation's Lawsuit against Retailers.http://files.shareholder.com/downloads/ACTI/1149915420x0x181837/5395 8f54-4908-40d7-9a02-cb0e7c176b48/ATVI_News_2008_3_20_General.pdf [05/05/2012]

Activision Blizzard (2011): Activision Blizzard Reports December Quarter and Calendar Year 2010 Financial Results. http://investor.activision.com/releasedetail.cfm?ReleaseID= 548900 [05/05/2012]

Auslander, Philip (2008): Liveness. Performance in a mediatized culture. 2nd ed.; London/New York: Routledge

Bailey, Kat (2009): Bon Jovi Rejected Chance To Appear In Guitar Hero. Rocker comes out in favor of Nirvana's protest against appearance. http://www.1up.com/news/bon-jovi-rejected-chance-guitar [05/05/2012]

Belinkie, Matthew (1999): Video game music: not just kids' stuff.http://www.vgmusic.com/vgpaper.shtml [05/05/2012]

Berardini, César A. (2008): Music Games Spur People to Play Real Instruments. http://news.teamxbox.com/xbox/18254/Music-Games-Spur-People-to-Play-Real-Instruments/ [05/05/2012]

Briegleb, Volker (2008): Warner Music will mehr Geld von "Guitar Hero". http://www.heise.de/newsticker/meldung/Warner-Music-will-mehr-Geld-von-Guitar-Hero-194298.html [05/05/2012]

Boyd, Andrew (2003): When worlds collide: sound and music in film and games. http://www.gamasutra.com/features/20030204/boyd_01.shtml [05/05/2012]

Brand, Karsten (2006): Computerspiele: Product Placement erwünscht... http://www.marketing.ch/newsletter/in_game_werbung.pdf [05/05/2012]

Bundesverband Interaktive Unterhaltungssoftware (2006): Unterhaltungssoftwareindustrie 2005/2006. http://www.biu-online.de/fileadmin/user/dateien/Marktzahlen_2005.pdf [05/05/2012]

Bundesverband Interaktive Unterhaltungssoftware (2010): Marktzahlen Computer- und Videospiele. Gesamtjahr 2009. http://www.biu-online.de/fileadmin/user/dateien/BIU_Marktzahlen_Gesamtjahr_2009.pdf [05/05/2012]

Chan, Andrew (2007): A Critical Analysis of Modern Day Video Game Audio. University of Nottingham: bachelor thesis.

Chang, Yaping/Yan, Jun/Zhang, Jinlong/Luo, Jin (2010): Online in-game advertising effect: examining the influence of a match between games and advertising. In: Journal of Interactive Advertising 11. No 1: 63-73

Collins, Karen (2005): From Bits to Hits: Video Games Music Changes its Tune. In: Film International 12. January: 4-19

Collins, Karen (2007): An Introduction to the Participatory and Non-Linear Aspects of Video Games Audio. In: Hawkins/Richardson (2007): 263-298

Collins, Karen (2008a): Game Sound. An Introduction to the History, Theory and Practice of Video Game Music and Sound Design. Cambridge/London: The MIT Press

Collins, Karen (ed.) (2008b): From Pac-Man to Pop Music. Interactive Audio in Games and New Media. Aldershot: Ashgate

Elman, Michael (2010): The (un)importance of orchestras in game scoring. http://www.develop-online.net/blog/153/The-unimportance-of-orchestras-in-game-scoring [05/05/2012]

entertainment software association (2008): 2008 sales demographic and usage data. Essential facts about the computer and video game industry.http://www.theesa.com/facts/pdfs/ESA_EF_2009.pdf [05/05/2012]

entertainment software association (2009): 2009 sales demographic and usage data. Essential facts about the computer and video game industry. http://www.theesa.com/facts/pdfs/ESA_EF_2009.pdf [05/05/2012]

entertainment software association (2010): 2010 sales demographic and usage data. Essential facts about the computer and video game industry. http://www.theesa.com/facts/pdfs/ESA_Essential_Facts_2010.PDF [05/05/2012]

GEMA (2010): Vergütungssätze VR-AV DT-H 3 für die Vervielfältigung von Werken des GEMA-Repertoires auf audiovisuellen Datenträgern (z.B. CD-ROM, DVD, Chip, Speichercard) in Spielen (Games) und deren Verbreitung zum persönlichen Gebrauch. https://www.gema.de/fileadmin/user_upload/Musiknutzer/Tarife/Tarife_vra/tarif_vr_av_dt_h3.pdf [05/05/2012]

Gilbert, Ben (2011): Harmonix hit with layoffs, intended to align with 'current product development plans'. http://www.joystiq.com/2011/02/07/harmonix-layoffs/ [05/05/2012]

Grant, Christopher (2011): Guitar Hero and DJ Hero DLC supply over after February. http://www.joystiq.com/2011/02/10/guitar-hero-and-dj-hero-dlc-dead/ [05/05/2012]

Grimshaw, Mark (ed.) (2011): Game Sound Technology and Player Interaction: Concepts and Developments. Hershey/New York: IGI Global

Hawkins, Stan/Richardson, John (eds.) (2007): Essays on Sound and Vision. Helsinki: Helsinki University Press

Jakobs, Benjamin (2009): Skandal-Rapper Sido verdankt seinen Erfolg der ersten PlayStation. http://www.eurogamer.de/articles/skandal-rapper-sido-verdankt-seinen-erfolg-der-ersten-playstation [05/05/2012]

Jørgensen, Kristine (2008): Left in the Dark. Playing Computer Games with the Sound Turned Off. In: Collins (2008b): 163-176

Jørgensen, Kristine (2011): Time for New Terminology? Diegetic and Non-Diegetic Sounds in Computer Games Revisited. In: Grimshaw (2011): 78-97

Kärjä, Antti-Ville (2008): Marketing music through computer games: the case of Poets of the Fall and *Max Payne 2*. In: Collins (2008b): 27-44

McDonald, Glenn (n.d.): A Brief Timeline of Video Game Music. [1972-2001], http://www.gamespot.com/gamespot/features/video/vg_music/index.html [05/05/2012]

McElroy, Griffin (2010): Power Gig: Rise of the SixString review: God took rock 'n' roll from you. http://www.joystiq.com/2010/10/28/power-gig-rise-of-the-sixstring-review/ [05/05/2012]

Microsoft (2002): Microsoft Acquires Video Game Powerhouse Rare Ltd. http://www.microsoft.com/presspass/press/2002/sep02/09-24projectrpr.mspx [05/05/2012]

Microsoft (2006): Microsoft Game Studios Acquires Video Game Luminary Peter Molyneux's Lionhead Studios. http://www.microsoft.com/presspass/press/2006/apr06/04-06LionheadPR.mspx [05/05/2012]

Microsoft (2009): Microsoft Agrees to Acquire BigPark Inc. http://www.microsoft.com/presspass/press/2009/may09/05-07BigParkPR.mspx?rss_ fdn=Press [05/05/2012]

Nielsen (2008): Grand Theft Auto: The Brand That Hits (And injures and steals and…sells). http://blog.nielsen.com/nielsenwire/wp-content/uploads/2008/08/white_paper.pdf [05/05/2012]

NPD Group (2008): Decline in U.S. CD Sales Drives Down Overall Music Demand by 2 Percent in Third Quarter of 2008. http://www.npd.com/press/releases/press_081218.html [05/05/2012]

Paul, Leonard (2010): Workshop Notes: Game Audio. Workshop held on 02/02/2010 at A MAZE Festival, Berlin. http://www.videogameaudio.com/ [05/05/2012]

Schiesel, Seth (2010): Is it virtual, or is it Rock? A border-tweaking experience. http://www.nytimes.com/2010/10/30/arts/television/30rockband.html [05/05/2012]

Schotzger, Erwin (2002): Computerspiele werden zu Musikpromotern. Industrie setzt immer mehr auf Games als Marketingtool. http://pressetext.de/news/020805039/computerspiele-werden-zu-musik [05/05/2012]

Taylor, Chris (2011): Guitar Hero Gone: What went wrong? http://mashable.com/2011/02/09/guitar-hero-dead/ [05/05/2012]

Tessler, Holly (2008): The new MTV? Electronic Arts and 'playing music. In: Collins (2008b): 13-25

Vivendi (2008): Vivendi and Activision complete transaction to create Activision Blizzard. http://www.vivendi.com/vivendi/vivendi-and-activision-complete [05/05/2012]