Game modding[1]

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Abstract

On a global scale media relying on computer technology and the Internet infrastructure play a decisive role in contemporary culture and society. This chapter deals with computer games, what is done with them, and what happens around them, in particular with the set of practices of creatively reworking preexisting games subsumed under the term game modding. Drawing on the available literature on game modding and my own according fieldwork, game modding is characterized as constituting processes of sociocultural appropriation. The practices in question are by no means eclectic or singular, but collectively shared by the members of identifiable and lasting communities.

Ablaze

If it was not for my having an appointment here and now, there would be little wonder in the downtown Manhattan spaghetti joint being perfectly deserted at that time of night. Way past the graveyard shift, uncanny twilight, floor covered by classical black and white checker tile, rows of lavishly upholstered benches, matching diner-style tables squeezed between them, an enormous mahogani bar in the back, and nobody to be seen. A cliché setting. But the cliché does not miss its target and brings home the menacing ambience quite nicely. Just if I would not be nervous and frightened enough yet. Alas, there is no choice, I have to fathom the darkness. Maybe they are in another room, well separated from the main area. Some black chamber of conspiracy. Those mobsters are equally fond of cozy backrooms as they are of laying traps – and something is definitely wrong in here. Things indeed start to go awfully wrong when I do my first tentative steps towards the unknown depths of the dimly lit Italian restaurant. A row of until now well hidden incendiary bombs detonates and sets the whole place on fire. There is no way back for me, out on the street, into the shelter of the blizzard. The main entrance door tightly locked itself shut, when it fell back into place once I had entered. Or so I imagine.

Matter of factedly neither me nor my *avatar*[2] ever went through that door. Both of us spawned right inside the restaurant, just beyond the doorstep, when I started to play chapter four (*Put out my flames with gasoline*) of part two (*A cold day in hell*) of the third-person[3] shooter *Max Payne*

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[2] In respect to computer games 'avatar' means the graphical representation of a game character controlled by a human player. The word itself is lent from the Sanskrit. It originally means an earthly manifestation of a numinous entity or being having descented to the realm of human beings. Hence the analogy: the manifestation of a human being having descented to the realm of computer generated and controlled entities or agents.

[3] In respect to computer games 'third-person perspective' means that the human player can see his avatar on the screen, usually viewed by a virtual camera hovering 'behind' the controlled game character. In contrast 'first-person' perspective means that the game's interface simulates the view 'through the character's eyes'.

(2001). A computer game. Nevertheless I intensely sense myself to have entered the restaurant the usual way, and now being there. 'Suspension of disbelief' it is called when talking about movies, theatre, or novels – 'immersion' when talking about computer games.

The aggressively licking flames eat away my health, I am running past the bar, through the doorway into another hall, much more luxurious than the streetfront eating room, but fire everywhere here as well. More rooms, corridors, the kitchen, more flames and explosions. The building is a labyrinth ablaze. Frantically I hit the save button after every room I successfully cross, then the inevitable happens. My avatar sears to death in agony. Reload of the last quicksaved gamestate, respawn, and another hot run through the burning maze. To no avail. Further attempts lead to my being quite familiar with the location, but not to escape. Again and again I try, but in the end I am always trapped in the inferno and die a lonely death in the Mafia restaurant, the snowstorm howling outside in the noir streets of a crime-novel New York City. Meanwhile meatspace time has caught up with ingame time, it is three o'clock in the morning. My frayed nerves give way and I leave gamespace.

But I refrain from going to bed, as I know that the story would haunt me and prevent me from sleep, just like it had done the previous nights. I remember something from my times as a teenager, owning a *Commodore 64* computer at the beginning of the 1980s, connect to the Internet, fire up my browser and type the words 'Max Payne walkthrough' into Google. The search instantaneously generates an enormous number of hits (35,000 plus) – I click the very top one. This leads me to a page which offers painstakingly written and illustrated paths through every chapter of *Max Payne*. After having read the solution to my problem I slap my forehead, because I already had been so close to escape, but had not realized it. Once there I start to explore the website of which the walkthrough is a subpage, and learn that it is not a mere site, but a huge portal, enormously frequented – the server statistics say that up to 1200 users are simultaneously navigating the site. There are article-, tutorial-, and media-sections, plus a download section for a variety of digital objects. Among the latter most prominently there are nearly 500 fully functional so-called 'mods' available for free download. Furthermore the portal has over 8000 registered users, who have posted more than 200,000 forum entries. Roughly for the first hour of reading forum-threads, I hardly understand a single word, as most of the content again refers to this occult things called mods.

Then I slowly begin to realize that I have discovered a culture which was hitherto unknown to me. The year is 2002, the bug bites, I am fascinated, catch fire, sense the further reaching meaning of the phenomenon, and start to design an anthropological research project centred around game modding.

Anatomy

The website I am talking of was the meanwhile long vanished *Max Payne Headquarters* (MPHQ), for three and a half years the largest privately maintained portal of an online community which initially condensated around the shared interest in, and practice of modifying the computer

games *Max Payne* and then *Max Payne 2: The Fall of Max Payne* (2003). Modifying, or 'modding', means the bundle of practices leading to the production of playable additions to existing commercial computer-game software, up to making completely new games out of it, plus the creation of a vast range of secondary and derivative artefacts. (Knorr 2006)

Like movies or novels, computer games are media. In accordance to the intentions of its authors, designers, and developers, a computer game mediates experiences to the players. The malleability and potential of the medium allows the mediation of a vast range of experiences. In the case of my example above it is the experience of living through a crime story, rather than the experience of some kind of contest.

Besides being a medium, a computer game first of all is a piece of software, a complex piece of program code comprising a range of different digital objects, which are structured and interconnected according to a specific anatomy.

The core of every modern computer game featuring a navigable threedimensional gamespace[4] is called the game engine. This central part of the program code does the main work, creates the gamespace, lets events happen according to storyboard and player input, makes sound and music to be heard at the right moment and circumstances, and so on. In short, it calculates everything to be experienced by the players, orders the hardware to generate the according stimuli, and to mediate them via the connected interfaces like, most common, e.g. screens and speakers.

In order to be able to achieve all this, the engine needs "raw material" out of which it can form its creations – like a loom needs wool to make textiles. For the needed substance the engine reaches down into the other parts of the game software, into vast storages containing digital objects of diverse provenience. There are 3D meshes (the geometry of the landscape and all objects including the characters), textures (the surfaces of every thing visible on the screen during the course of the game, from the skins of characters to the facades of buildings), sounds and music, and there are scripts and rulesets by which the game and the gameworld function.

Most contemporary 3D computer games additionally comprise subengines for e.g. sound and physics. For instance a physics engine manages and controls the physics of the gameworld and the physical properties of all ingame objects, from e.g. wooden chairs to explosive projectiles and beyond. But the underlying modular principle of the anatomy remains: There is the engine, or the engines, and there are libraries, containing the digital objects out of which the engine/s create/s in real time the game as it is played and experienced.

The decisive circumstance now is the fact, that the innards of the engines normally are inaccessible, but the libraries and their contents are not. When a company commercially releases computer game software, it is made practically impossible to modify the engine, as only the machine-

[4] The practice of game modding of course is not restricted to the shooter genre or even to 3D games, but is to be found in the vicinity of almost all computer games. Out of several reasons I have chosen 3D shooters as an in-depth example. First of all the vast majority of my own according fieldwork happened and happens in the milieus around this games. Secondly this genre has the biggest impact in terms of transformation of technology (Montfort 2002), economy, society and culture. (Kushner 2004 [2003]).

readable binary code, but not the human-readable source code written in a programming language, is distributed.[5] The libraries however can be opened and their contents can be viewed, deleted, added upon, and generally tinkered with. This granted access makes a game moddable.

Astoundingly enough the sketched macro-anatomy of computer game software, to which the whole industry since more than a decade sticks, was not created out of pondering the technical issue of efficient program architecture, but as a direct consequence of the sociocultural practice of game modding.

In 1992 id Software, the company of legendary programmer John Carmack and his congenial game designer John Romero, released the, due to its contents, controversial *Wolfenstein 3-D* (1992) with which the immense popularity of the first person shooter genre started. Soon far-reaching modifications of the game appeared and were distributed via the Internet. This mods not only tweaked the game by e.g. giving the player character more health or ammunition, but new original content was introduced. Although truly taking delight in the mods, Carmack and Romero worried about their destructive nature, because in order to modify *Wolfenstein 3-D*, you had to delete the particular pieces of original code and substitute it with your own. Once e.g. a character was changed, there was no possibility to bring back the original one.

In the following year id Software released the even more controversial and in several respects seminal *Doom* (1993). Seminal for immersive 3D technology, for the gaming industry, and for a new subculture that would soon hit and influence mainstream pop culture in an accelerating pace. An estimated ten million copies distributed during the first two years secured the impact of its revolutionary real-time rendered 3D graphics, the stereo sound system, networked multiplayer gaming, and several more pioneering features. Decisive for my argument here is the modular approach Carmack took as a reaction to the experiences with *Wolfenstein 3-D* mods. Simplified *Doom* consists of the engine and a WAD, an acronym for '**W**here's **A**ll the **D**ata?', containing the graphics and sound. Additionally Carmack released the source code of the applications which were used to create the contents of the game. This way it was made easy for aficionados all over the world to generate their own content and wrap it up into a WAD. Now you could direct the engine to load the data needed for creating the game not only from the original WAD, but alternatively from those you or other modders had made. (Kushner 2004 [2003], pp. 130, 165-169)

The adoption of the new architectural principle yielded an economical consequence, as a new commodity was created. From now on game developing companies not only were able to sell complete standalone games to the end-users, but also separate game engines to other developing companies. Today there are game developer companies which in fact do not produce computer games, but specialize in the production of engines or sub-engines, like physics engines. This engines are not only used to create games, but serve all kinds of interactive real-time visualization, especially in the natural and engineer sciences.

[5] Additionally legal means in the form of licences, and the application of national and international copyright and patent law, are put to use.

This degree of modularity of game software and abstractness of game engines was not yet achieved with id's original release of *Doom*, as the sets of rules which make up the game itself still were stored well inside the engine. But *Doom* spawned a literally global gaming and mod-making community of unprecedented size and activity. A transnational group of modders and hackers collaboratively developed a free tool that allowed to rip the code of *Doom* apart. In the early days of 1994 the *Doom Editor Utility* (DEU) was uploaded to the Internet from New Zealand, where Brendon Wyber, the leader of the group, was situated. The application *DeHackEd* by Greg Lewis followed and allowed modifications of the game's executable file. (Kushner 2004 [2003], pp. 130, 167-168)

From this day on the full spectrum of game modifications as we know it today was possible. The continuum reaches from gameplay-tweaks via new and original gamespace-topography (maps), up to so-called total conversions (TCs). The latter constitute completely new games; the original game is not recognizable anymore, as it only delivers the base of the new game, the engine, nothing more. When a modding team produces a TC, it does nearly exactly the same as a game developing company which has purchased an engine from elsewhere and builds its own game upon it. Yet there still is a difference, because a company which has licenced an engine from another manufacturer gets access to the sourcecode and more than likely makes changes to it.

From some days later on we deal with a specific official stance of game developer and producer companies towards mods, which has not much changed until the present day. The less hacker-ethics drenched, and more orthodox business oriented forces within id Software strived to keep the practices of modifying their product under control. Finally the 'Two Johns', Carmack and Romero, gave in and granted Jay Wilbur permission to post according legal terms. Basically this terms comprised that mods to *Doom* were legal, as long as it was stated that they are not a product of id, and hence that id has no responsibility for them or their potential technical and/or legal consequences, and that they must only function with a purchased copy of the original game. (Kushner 2004 [2003], p. 169)

All this leads to a tentative definition of game modding as the production of playable *additions* to commercial computer game software by *private* individuals or groups of the latter.

Assessment

Since the dawn of the twentyfirst century this phenomenon has been recognized within academical circles and several papers have been published.[6] All texts stress the innovation generating creativity of the communities in question, especially those which interprete game modding as a form of art. (Catanese 2003, Mitchell & Clarke 2003, Poremba 2003a, b, c) But especially the art perspective renders an idealised picture of game modding, associating it with the remix culture and subversive interventions

[6] It has to be stated that by the very cursory and more than brief summary to follow, I am doing grave unjustice to the dealt-with articles due to the limited space here.

of artistic circles. Furthermore this approaches appear to be object centred, reminiscent of the old tradition of material culture within anthropology.

The papers focussed on the history of game modding (Au 2002, Kushner 2005, Lowood 2006) view the phenomenon from a more neutral vantage point and bring up the aspect which is of central interest to the majority of the authors: The collapse of the strict boundaries between the realms of production and consumption. (Flowers 2006, Kücklich 2005, Mactavish 2002, Nieborg 2005, Postigo 2003, Sotamaa 2005, Tavares, Gil & Roque 2005)

Early on it is stated that the producers of computer games meanwhile are economically dependent from game mods (Au 2002), then a decidedly critical stance towards the industry sets in. Hector Postigo (2003), later seconded by Kücklich (2005), most pointedly characterizes game modding as post industrial unwaged labour and goes on to analyse its transition to paid work by the incorporation of fan bases into the industry. Development practices analogous to those found within the Open Source scene are identified (Scacchi 2004), and the way the industry deals with it is more (Flowers 2006, Sotamaa 2005) or less (Nieborg 2005) harshly criticized.

For the anthropologist those approaches which directly or indirectly draw on Henry Jenkins' concept of participatory culture (Jenkins 1992, 2003) have the biggest attractiveness. (Morris 2003, 2004, Simons & Newman 2003, Sotamaa 2003) Especially Sotamaa points out that gamer-made content is radically intermedial. His focus bears the danger of returning to the artefacts as the uncontested centre of attention, but gets complemented by Mactavish's (2002) insistence on embeddedness. He confesses that more authorship is granted, but that the reconfiguration of producer-consumer relationships is bounded and relies on social, cultural, and economical elements of mainstream culture.

Finally a trend recently gathering momentum is to be mentioned, which is not so much concerned with the socioeconomical epiphenomena of game modding, but tries to instrumentalize the practice for educational means. (Engeli 2005, Prensky 2003, Seif El-Nasr & Smith 2006, Yucel, Zupko & Seif El-Nasr 2006)

All this assessments of the phenomenon game modding are valid, every single one sheds light on the phenomenon from a particular vantage point. With an anthropological approach on my mind, my proposition is to conceptualize game modding as an instance of sociocultural appropriation, because this concept is able to render a more complete picture, and to illuminate the obfuscations, without contradicting any of the above interpretations.

Appropriation

Contemporary digital technology can be seen as first of all comprising physical and non-physical artefacts: hard- and software. Despite of the immaterial nature of software, it is possible to deal with the according artefacts as objects (Barwell 2005), hence a material culture approach seems applicable. But reducing the focus on the artefacts diffusionist-style, as more philologically or 'art' oriented perspectives sometimes are inclined to

do, would do great injustice to the wealth and complexity of the phenomena in question. For contemporary anthropology throwing its gaze upon modern information and communication technologies, it is an imperative to grasp and interprete not just the manifestations of technology, but to capture and comprehend what happens around – especially as the topic of this volume is media practice. Enter a new approach to material culture, action and actor oriented (Spittler 1993), as recently shaped impressively by Hans Peter Hahn (2005), bringing the according 'Bayreuthian tradition' full circle. Especially in the case of game modding I deem (Knorr 2006, 2007, 2008 forthcoming) the concept of sociocultural appropriation (Beck 1990, 1991, 1997, 2000, 2001, 2004, Hahn 2004a & b, 2005, pp. 99-107, Spittler 2002) to be the most powerful tool from 'new material culture'.

Artefacts are surrounded by interpretative flexibility (Beck 2001, p. 67, Knorr 2007), meaning they are open to interpretation. 'The street finds its own uses for things – uses the manufacturers never imagined.' Sociocultural appropriation exactly means what writer William Gibson thus brought to the point. (1989, 1991, p. 27) In the wake of anthropology opening itself up towards modernity and the reality of the global (Kearney 1995; Hauser-Schäublin/Braukämper 2002), artefacts were reintroduced to the center of interest. (Spittler 1993, Feest 2003, Hahn 2005) Since some years special attention is payed to industrially produced, globally diffusing goods, and to what happens with those. (Miller 1995) The observation of quite surprising local rededications lead to abandoning the concept of adaptation (Bargatzky 1984, Beck 2000) to the cultural ideas of the seemingly dominant, heavily industrialized societies from where the artefacts stem. Instead a perspective was adopted which emphasizes the agency of the protagonists situated at the on first glance 'receiving end' of the production, distribution, consumption chain. Enabled action and productive creativity giving birth to innovations are the decisive elements generating astonishing results, which are not simply infused old patterns lent from the societies involved.

However, the majority of studies so far concentrate on the cognitive-intellectual process of ascribing new meaning, but not on the actual reworking of industrial artefacts. Recent papers are closing this gap. (Beck 2001, 2004, Böttcher 2003, Hahn 2004a) Within the scope of this chapter I am trying to transpone the thus gained insights and to apply them to the understanding of game modding. The protagonists are not seen as passive and malleable consumers, but as enabled actors in regard to the technological, economical, psychological, social and cultural dimensions.

The concept of sociocultural appropriation encompasses a whole spectrum of aspects reaching from taking into possession, via reinterpretation and rededication, up to reworking. All the according processes neither float in limbo, nor are they simply based upon 'rational', pragmatical or opportunistical decisions, but are closely tied to social circumstances and cultural ideas. Cultural ideas inform the appropriation, social circumstances mark its possibilities, and the process itself generates retroactive effects impacting on the appropriating society and culture, ultimately altering them. Therefore sociocultural appropriation is a dynamical process housing nested and interlocked feedback loops.

As Spittler stresses, every form of appropriation starts with taking something into possession. This already involves interaction (2002, pp. 16,

19, 21-25, 29), and hence interrelationships between producers and consumers. Commercially marketed computer games seemingly are perfect prototypes of 'the' industrial commodity. In consequence the act of buying comes to mind firsthand. Alas, within the scene also other modi of acquisition are practiced, resembling phenomena well known from the classical fields of anthropology. First of all there is downright larceny – online accomplished Razziae, which involve breaking into secured corporate networks via the Internet. Spectacular examples are the theft of the source code of *Half-Life 2* (2004) and of an alpha version of *Doom 3* (2004), long before the two games hit the shelves of the legal market and became international bestsellers. (Knorr 2007)

But the alternatives to purchasing do not cease once a game is released officially, quite to the contrary. The copy protection of legal data carriers is bypassed and/or removed ('cracking'), the software itself is freed from the boundaries resulting from the physical restraints of media like CDs or DVDs, to which it was doomed, and is distributed online for free. Within the specialist cracking milieu a moral economy based on prestige and reputation (quantity of cracks per individual, how fast, clean, and elegant has the crack been accomplished, etc.) is at work, which very much reminds of the big man system. Additionally the distribution, or better redistribution, of cracked software more often than not happens via so called peer-to-peer filesharing systems. During the last years the collaborative filesharing protocol *BitTorrent* (Cohen 2003) became the most popular of this systems worldwide. Astoundingly enough the principle of reciprocity already is built into the way the *BitTorrent* client software functions – the more and the longer you upload, the faster is your download.

There is yet a legal way of appropriating game software and developing tools before they appear on the official market. The functionality of this channell is based on prestige within the modding scene, which in turn generates proximity to professional game developers.

Unprecedented within the industry, the German game developer company Crytek recently made this step publicly. Long before their latest game title *Crysis* (2007) was released in mid of November 2007, Crytek selected four modding teams and gave software development kits (SDK) for free to them. (Crytek 2007) Mind that we are talking about intellectual property of highly estimated value, about two different commodities targeted at two completely different groups of customers. First of all the retail game itself, currently sold to an audience of millions worldwide, secondly the engine technology and the developer tools to be licenced not only by game developing companies, but although by other branches of the industry plus even universities and research institutes. Both, *Crysis* the game, and *CryENGINE 2* – the former's technical innards – do not constitute negligible niche products, but are currently deemed to be the cutting edge of realtime 3D visualization. Nevertheless this economically significant intellectual property was passed on as a gift – of course secured by legal contracts – into the realm of the game modding scene.

Once an artefact has arrived within a given scene or milieu, it may well happen that it is used as intended, that means according to the vision of its creators. But quite often it is ascribed with new meaning and gets embedded into the cultural context.

The games *Max Payne* and *Max Payne 2*, presented in the introduction, are story-driven singleplayer games. Primarily out of technological reasons they neither feature a multiplayer function, nor can it be implemented. That means the software can not mediate human-to-human interaction online, so that it is impossible for players to meet within the respective gamespaces. Due to this 'deficiency' already back in 2001 pundits saw little potential for the *Max Payne* series to spawn a solid online fandom and acquire the status of a 'cult game'. Despite of this experts' opinions, *Max Payne* became a bestseller, not only was voted 'Game of the Year 2001' by the gaming industry, but triggered the formation of a very active, still existing and striving community with modders as its core. (Knorr 2006) In forming and maintaining the community, *Max Payne* single-player gamespace played, and still plays, a role. Notwithstanding the impossibility of using it as a meeting place, it was ascribed the meaning of collectively experienced space, which serves as an identity generating frame of reference. Every single member of the *Max Payne* community will instantaneously recognize the location and situation I described in the introduction I christened *Ablaze*, and will remember having been in the Italian restaurant, and having experienced the horrors of the hellfire there, too ... 'we' are sharing memories of intense moments of suspense, thrill, and fear. One symptom of this very aspect of creating *communitas* are the so called 'walkthroughs', also mentioned in the introduction. This derivative artefacts appear online as soon as the whole course of a game is cognitively appropriated by members of a gaming community. Walkthroughs are meticulous documentations, augmented with postprocessed screenshots from the game and/or even videos, of the complete paths through computer games based upon linear storylines. Naively looked upon, walkthroughs are 'spoilers', giving away the storyline, therefore reducing pre-purchase fascination with the product, and ultimately counter-productive to the efforts of the marketing department – at least for the time immediately following the release, as some months later a well-selling game's franchise will be enriched by an 'official solution book', the ink and paper version of a walkthrough. But besides featuring the 'solution' to a game, walkthroughs mediate the complete spatial and chronological topography of the gamespace in question. When talking about a game online, no matter if in real time or delayed, the members of its surrounding community continuously are using 'their' walkthrough as a work of reference. In this context a walkthrough supports to ascribe the meaning of a frame of reference, helping to generate and reproduce communal identity, to the contents of an unaltered out-of-the-box game. In respect to collective realtime experience walkthroughs obviously can not substitute the absence of multiplayer functionality, but can compensate it to a certain degree and on another level.

Way more far reaching than the implications of walkthroughs are, is the reinterpretation of the artefact computer game which leads to the 'modder's stance'. Years ago one of my closest collaborators, main informants, and dearest friends within *Max Payne* modding in an e-mail to me already brought it to the point: 'I hardly play those games, I immediately start to mod them.' Being a prolific and expert programmer he immediately delved into the coded bowels of *Doom 3* as soon as he had his hands on a copy of the game's alpha version which hovered through the shadowy parts of the Internet long before the game finally was released in August

2004. He only played the game for some minutes, until he had caught the peculiarities of its gameplay, then went on examining and understanding the software. Within days he not only had achieved third-person perspective as an alternative to the built-in first-person perspective, but had brought the game to emulating the 'bullet-time'[7] effect, the spectacular feature first seen in *Max Payne*. This of course never was envisioned by the author of the *Doom 3* engine (aka 'id Tech 4'), John Carmack.

Another close friend from the *Max Payne* community just recently (September 2007) has published online a list of the computer games he possesses or has possessed. He is one of the most prominent and respected figures within the scene, equipped with the highest reputation among *Max Payne* modders and developers alike. His activities earned him the appraisal to be included in the official credits for *Max Payne 2*. Within his list he gave information about if he ever has completely played through a particular game, or not. Significantly he has not yet finished *Max Payne 2*. The game was published already in 2003, and above him being mentioned in its credits, he himself has worked on several mods for it. Modders do not play games, but play *with* games.

Beyond reinterpretation the next stronger form of appropriation is rededicating artefacts to new applications. In respect to computer games the *machinima* phenomenon, which during the last years emerged from the subcultural shadows and gained significant attention within traditional mass media, is a striking example. Stanford historian of science and technology Henry E. Lowood already has phrased it perfectly: 'The history of machinima illustrates a number of themes in the appropriation of game technology to create a new narrative, even artistic medium.' (Lowood 2005, p. 15) *Machinima* is a neologism resulting out of the fusion of the words 'machine', 'cinema', 'animation', and 'anime'. It means the creation of animated movies by way of using computer games or game engines. More precisely put, it is the creation of visual narratives by 'recording events and performances (filmmaking) with artistically created characters moved over time (animation) within an adjustable virtual environment (3D game technology platform or engine).' (Marino 2004, p. 3). That way computer games literally are transformed into movie production studios, as game engines allow to control and manipulate environment and protagonists in real time. For the creation of machinima movies an unaltered out-of-the-box game can be used, but more often than not custom content is introduced.

This leads us to the strongest form of appropriation, the reworking. Modifying games of course means reworking. The quality of game modifications spans from crude technical exercises to artistical comments on, and interpretations of contemporary history, society, culture and popular culture. The spectrum is vast and the numbers are legion – for the original

[7] The concept of bullet-time goes back to the work of cinematographer Dayton Taylor (Knorr 2000), got tremendously popularized by the movie *The Matrix* (1999), and was for the first time to be experienced interactively in *Max Payne*. The developers of *Max Payne* at Remedy Entertainment coined the term and later sold it to Warner Bros. Bullet-time means extreme slow motion up to completely freezing a scene while the camera can still be moved around the space of the scenery. As a dramatical element in computer games, bullet-time allows the player to act in realtime, while all other events inside the gamespace are extremely slowed down.

MP1 alone over 500 mods have been created during my active time within the community. Just to give an idea, I am shortly describing five mods, focussing only on the aspect of the range of graphical styles employed.

The modification *New Dawn* tells a story much the way the out-of-the-box game does, but surpasses it in terms of photorealism. In order to achieve a film-noir ambience for *The Family*, a mafia-themed mod, everything was reduced to greyscale, except explosions, the muzzleflashes of guns, and blood – the mod preceded *Sin City* (2005) several years and the creators were not aware of Eisenstein's *Battleship Potemkin* (1925). *Polar Payne* lets the player experience over-the-top violence seemingly straight out of a vintage Tom & Jerry cartoon by Tex Avery. *Xiao Xiao* allows you to run around a pen and ink 3D-environment as a stick figure. Finally *The Adventures of Sketchbook Sam* turn technological development upside down and force the 3D-engine to emulate a 2D sidescroller, featuring a roughly inked stick figure fighting its way through the pages of an exercise-book. All the mentioned mods exclusively consist of custom material created by the members of the respective modding teams. From the point of origin, the game *Max Payne*, only the engine and the program architecture were used.

This kind of complete reworking requires an all-embracing cognitive appropriation of the base: An understanding of how the software works on the level of mastership. That means understanding the software on the same level as its creators, and sometimes beyond. Shortly after the Kung-Fu modification for *Max Payne* was released on the Internet, the staff at Remedy Entertainment communicated to the *Max Payne* modding community that the mod brought the work at their office to a grinding halt a whole day long, as everybody in the building was Kung-Fu fighting and fast as lightning on the screen. The developers' comment on and justification of their fascination was that they simply had not been aware that what the mod achieves was possible with the engine they had created.

But reworking as an instance of appropriation does not simply mean deconstruction and reassembly in the sense of an artistic collage. A reduced perspective like that again is too strongly focussed on the objects themselves. Appropriation’s decisive dimension is the transformation of the relationships between the objects in question and the members of the appropriating group. An example from a slightly different realm perfectly illustrates this.

Close kin to game modding is the modification of the graphical user interface (GUI) of a computer's operating system (OS). Changing the way of how everything on the screen looks and behaves is a widespread craving of computer users. In consequence since several years there are companies providing according services. Brad Wardell, a professional within this industry has summed it up (2006):

> Once upon a time some user, some where, noticed that their computer looked exactly like everyone else's computer. And that just didn't make sense to them. After all, everything else is personalized based on the individual needs and tastes of the consumer – cars, phones, shoes, appliances, houses, etc. Yet computers, in which people spend so much time in front of, looked exactly the same. This user started looking at what they could do on their computer to *change it to be more their own* [emphasis mine]. [...] This user wasn't alone. There were thousands like him. People of all ages from

> around the world had the same desires and no way to address them. But nature abhors a vacuum and pretty soon the pieces started coming together. [Community-building set in.]

The according practices from the informal scene strikingly show the cultural difference between modders and professional customizers, because high risks are taken in order to achieve seemingly circumstantial effects.

All time favourites of *Windows* GUI-modding are changing the looks of the start button and the boot screen. There are several ways for replacing the start button, among which the manual procedure has the most appeal within the scene. This classic way involves modifying crucial OS files by way of disabling the system file checker, which guarantees the system's stability and integrity. In the case of the Windows start button the 'explorer' executable has to be modified – the 'shell', managing all access to and communication with the interior of the system. In the case of *Windows XP* changing the boot screen forces the deepest step possible, modifying the very heart of the darkness an OS is to most users, the so-called 'kernel'. Wardell is horror-stricken: 'Just the thought that someone was patching their OS kernel to have a new boot screen sends shivers down my spine.' It sends shivers down the spine of those who do it, too – but they appreciate the shivers.

Changing the interrelationships between artefacts and human beings is the decisive aspect of sociocultural appropriation. This very much is manifested in the obviously insane stunt of tinkering with your operating system's very core, risking to ruin everything, only to replace an insignificant picture, 640x480 pixels in dimensions, equipped with a meager palette of 16 colours, which you only see for some seconds when booting your machine. The replaced picture is not essential, it is only the symptom. Essential is the practice of messing around with the kernel for no apparent reason, and then the awareness of having done so.

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