GAMECAST®:
A Cross-Media Game and Entertainment System

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Abstract
Collaborative and consumer co-design of interactive television shows are a buzz word in today’s media industry. Considering that especially the content industry is one of the major economic growth sectors, consumer contributed content will have major impact within this sector. Especially the richness of television and its interactive features allows mass-participation and augmented gaming experiences for players. Within the scope of this paper, we present GAMECAST – a concept that lets the audience actively influence the plot of a television programme via Internet. GAMECAST is a participatory television show, which merges the medium television with the medium online gaming. The consumer is active content creator and co-designer in creating the dramaturgy and storyline of each sequel.

2. Introduction
Today more and more attention is given to those cross-media approaches that can be taken to heighten the audience’s sense of involvement and participation in entertainment environments of the future (Boumans, 2005). Modern audiences are likely to appreciate the opportunity to be an active and involved participant, rather than to be passively entertained (Hales, 2007). The goal of modern game concepts goes thus beyond just satisfying a simple "win condition". Today's game systems mediate collective participation, communication and involvement enabling the construction of a collective "self" in mixed-reality environments. Digital stories become dynamical hyper-dramas, sometimes with unpredictable sometimes with semi-predictable endings. The most thrilling aspect in creating the interactive plot is the creation of digital characters and the emotional binding between player and the virtual pre-defined roles in the game. This process can be seen as augmentation of its ‘self’ while traversing through the game environment by interacting with spontaneous emotional actions. Within the scope of this paper, the GAMECAST broadcasting system is presented.

3. GAMECAST Broadcasting System Overview
GAMECAST has been designed as digital interactive broadcasting system, which lets the viewers actively influence the plot of a TV program via internet. It enables viewers to impact the storytelling and even watch one's own digital-self in form of an avatar live on TV screens. The main part of the system consists of a special server-client network capable to generate a video data stream out of the player interaction. The result is streamed just-in-time to a TV station and broadcasted from there via TV and IPTV.

The goal of this system is to take the concept of virtual communities within a broadcast (Benford, 2000) to the next level where the aspect of controlling a character on the TV screen finally can unfold its true excitement: appearing as digital actor and grasping towards self approval and digital fame. Therefore GAMECAST aims to create a solution for enriching the genre of Massively Multiplayer Online Games (MMOG) (Martin, Chatfield, 2006), with the emotionality and social acceptance of television.

4. The GAMECAST Storytelling Concept
GAMECAST is a multi-episode television broadcast, merged with a video game paradigm. It relies on a collection of scripted scenes with alternative storylines combined with live-rendered player interaction. In order to be efficiently applicable to existing videogame engines, the basic storytelling concept is based on a branch structure model (Samsel and Wimberley, 1998). It offers an efficient way to enable player interaction, which is fast paced and looks like a real movie scene. In order to reduce the number of story paths, branching and bottlenecking methods are implemented via forced paths (Samsel and Wimberley, 1998). The consumer experiences GAMECAST as a multi-episode broadcast on TV including a subsidiary video game. The story concept is based on a serial drama, where the storyline of subsequent episodes depends on the prior ones, thus the consumers’ choices.
The linkage between the series and the game is provided by a special Internet platform that offers an online version of the series settings. The online world is a game-like virtual environment. It is designed to allow users to simultaneously exist in a persistent online universe where their avatars communicate, socially interact and compete with each other. The game requires players to collaborate in helping characters perform particular actions, take roles and reach different goals.

Whenever an event of the plot occurs (e.g. a battle), users have the possibility to interact with the scene over the Internet. This interaction is granted through game elements, which allow users to fight out the very same conflict that occurred in the series plot. To give an example: in a series with a medieval setting, the story part leads to a point where the series hero and his comrades encounter the army of his enemy. In the following game elements, users will fight out this conflict either on the side of the enemy or as the hero’s troops. The scenery matches the setting that was shown in the series and even the main characters of the plot are competing as computer controlled characters within these fights. While each player experiences these competitions through a camera angle that is set directly behind his digital avatar (Fig. 1), normal viewers are watching all scenes presented in cinematographic camera angles, which closely resemble a normal movie (Fig. 2).

Depending on the outcome of these fights, an appropriate follow-up plot is selected by the system and attached to the current storyline.

5. Interaction Model

To gain an interactive role within the GAMECAST universe, users have to buy the matching GAMECAST game on DVD and register to the viewer's point of view.

Future versions of the GAMECAST system will no longer rely on scripted story branches, but allow the plot of each episode and each scene to emerge out of the interaction between players. This complex concept of storytelling will feature computer controlled characters who as well as human players will pursue their own goals and adapt their strategies according to its success or failure. Players will be able to interact like actors in an improvised scene. While they are communicating via voice chat, a webcam will track lip movements, facial expressions as well as gestures and adapt these parameters synchronously to their avatars. This concept’s storytelling evolves naturally out of the actions and reactions of all players. A consistent dramatic flow is granted through the guidance of a story engine that takes the role of a director, who leads the interaction into a dramatically fruitful direction. These methods aim to stir a dramaturgical development, which resembles a dramatic arc that incorporates equally arranged moments of suspense and resolve. In this future approach not every scene will happen live during the broadcast. Many scenes will be an edited version of the dialogues and events that occurred online in the time between the broadcasts. To reach this future state of social gaming, certain developments, like consumer systems that are able to recognize facial expressions and human speech, need to be made. The most important one is the development of advanced multiplayer story engines that are able to track and adjust the course of the story according to the interaction between huge numbers of human players and computer controlled characters.
game’s online world. Therefore players need to create a personalized avatar using a special visual editor, which enables modelling the avatar’s appearance based on images of the user’s face.

The GAMECAST system solves the problem of incorporating a huge number of active agents into a TV series by implementing a special model of graduated influence levels. These levels depend on the user’s performance. The first level enables players to compete against and amongst many others. The better performing and executing players get the chance to appear in the more important scenes together with plot-relevant computer controlled characters. Finally the best players have the possibility to become active main characters of the series. These players can even decide how their character should react during the series’ dialogues. To guarantee a natural flow of each scene, an interaction menu, which suggests answer and reaction options, will appear on screen 5 seconds before a player has to react. If a player waits too long, his avatar will stay in a state of hesitation, which matches his current feelings. The computer-controlled characters in this scene will react to this.

Player controlled main characters will dramaturgically arise out of the competition situation in which they were chosen. For viewers (non-players) it looks like a normal movie situation: one brave, yet unknown knight is able to achieve victory and save the series’ heroes within a dramatic situation in which hope seemed already lost. From now on his story will be featured within the series. Through ranking players into a graduated social system, this model aims to enrich each player’s influence on the series plot with a certain amount of social value.

While normal viewers experience a GAMECAST show as a TV series that ideally does not differ from a usual series, each player sees an individual, interactive version of every episode. These versions focus on each avatar’s individual story. This includes special guided scenes in which supporting characters (controlled by human game leaders or the computer) explain the goal of the mission and encourage them. The environment is voice-chat enabled so that the players can communicate with each other. Due to the huge number of players and the limited number of main roles it is important to make every single player feel that he is experiencing an individual story in which his own avatar is the hero. Identification in this approach could be compared to the feelings of young activists during a revolution. While they strongly identify with the leaders of their fraction and want to help a common vision prevail, they constantly fight their own battle together with their comrades. Pursuing an individual ‘adventure’ while important things on a global level keep happening, this allows the synthesis of immersing into a personal and a global plot at the same time. The thrill is the question: how far will one come, how much will one impact the global development?

GAMECAST implements a drama-like, collaborative interaction approach. This fosters the thrill of the unpredictable; as suspense originates from the existence of a certain gap between the audience’s and players expectations and the final outcome of the plot (Heintze, 2000). The GAMECAST show can be followed on a 24/7 basis. In the time between each broadcast, players can experience the series’ dramatic universe online by exploring the virtual GAMECAST world. The narrative model for this part is based on a non-linear version of the ‘string of pearls concept’ (Braun, 2003), where a player can choose which side he will join and which quests he will start. Changes in the virtual world affect the TV experience and vice versa. For example the issue of psychological behaviour and practices of partiality in a social context can affect the unfolding of the story. However, actions that would change the plot of the series in a general way are made impossible by using dramaturgic game design arrangements. Especially killing a main character in the time between the episodes is made impossible, for example by other computer-controlled characters guarding him and helping him in critical situations.

6. Technical Implementation

The technical concept for the GAMECAST broadcasting system builds upon client-server architecture. The online world is generated and kept persistent by the games’ software, which runs continuously on a server cluster. Players are able to connect to this server via client software, which is part of the GAMECAST game programme. Virtual cameras observe and record the action in the game as special clients who are able to fly around freely and are invisible to other players. The GAMECAST computer generated imagery (CGI) video signal is rendered using the production techniques of Machinima movies (Lowood, 2007). The system aims to use the game and 3D graphics engine of modern MMORP Games. While textures and graphic models are stored on the game DVD, the game’s graphics are individually calculated by each client computer according to the game data transmitted from the server. Modern graphic engines already allow complex facial animations and movement possibilities as well as interaction between hundreds of characters at the same time.
Therefore each character’s level of detail is often scalable from complex 3D representation to less structured vector models and even two-dimensional sprites, according to the distance between the character and the camera.

Depending on the producer’s priorities, camera angles could either be automatically chosen and mixed by algorithms, which consider dramaturgical constraints like Courty, Lamarche, Donikian, and Marchand’s approach (2003) and/or by a team of human camera operators and a director. The second solution is comparable to the situation during a live broadcast in a traditional TV studio (see Fig. 3). Every camera operator controls his digital camera over a real-time camera control interface (Greenhalgh, 1999) and observes the action around different plot relevant characters. A human director assembles the final mixing of the series out of these video and audio signals, which is then broadcasted live via TV to normal viewers and via IPTV to the PCs and consoles of active players. All camera client computers have to possess a 30 second video buffer, which allows showing interesting developments even after they already happened.

The system’s architecture aims to be easy attachable to MMORPGs which are already on the market. Through using the game engine and models of existing MMORPG Games, development costs can be kept at a comparably low level. Through this, the GAMECAST DVD could be sold as expansion pack to an existing MMORPG at a moderate price level.

The required hardware resources are a standard PC (as of 2008) or a game console (Xbox 360, Playstation 3) with a fast Internet connection (DSL 2000 or higher).

7. Economic Approach

According to media analyst Screen Digest’s study, the western MMOG market is currently worth more than 1 Billion Dollar and is expected to grow about 50 percent until 2011 (Harding-Rolls, 2007). Donovan, Lee, Malmaud and Yan state that for new competitors this market is hard to penetrate “unless they have a unique product” and that “identifying niches is an important part of designing a successful entrant” (2006). So what do gamers seek in this genre? In a study on the German videogames market, the target group of MMORP Games was categorized as “Fantasy-Gamers”. The study reports that most of these players had two major wants: escapism and acknowledgement (Hengstenberg, Zervos, 2006). While these kinds of online games have become a considerably high economic factor, mass media starts to recognize them as target group, creating specialized magazines and TV shows. But could a further merging of the forms of MMOG and fictional TV formats help competitors to expand or new entrants to penetrate this market? The belief that appearing on TV equals appreciation has become a kind of common sense in our modern society. Countless Casting shows base upon the young audience’s desire to become famous. Internet platforms like ‘YouTube’ and ‘MySpace’ are full of exhibitionistic user generated content, but they lack the medial and social impact that a classical medium like TV has to offer.

This hunger for appreciation and stardom is what the GAMECAST system aims to satisfy. It is able to offer the chance to become a digital character in a fictional TV series to an audience that is urgently longing for new chances to approve, present and through this find and define themselves. On the other hand, this system makes the trend of user generated contend usable for the TV medium. As TV borrows its values to games, it has the chance to acquire the advantages that this new form of media has created.
8. Discussion and Conclusion

This paper presented GAMECAST, a concept of a cross-media game and television based entertainment system. The system combines the advantages of two media, the Internet and the TV medium. It redefines the role of players providing the unique means of self-realization and self-approval through participation in a highly interactive game environment. Having the possibility to influence the plot lets immerse the audience into the intended emotion of the broadcast and boost the audience’s stickiness at the same time. The user gets the feeling that he or she can support his favourite character and actively impact the storyline. The joy and the thrill within each action are always present. This helps to satisfy and to retain the player community. Different genres like series about sport, middle age life, fantasy worlds, pirates, sci-fi or spy and detective stories let deploy GAMECAST in a very different and unique way. Didactical concepts behind a game design may raise the acceptance of the system and let it apply for learning purposes as well. Especially, when collective intelligence is to be promoted and spontaneous problem solving skills are to be trained. The concept of improvisation is the educational key for the improvement of communication skills (Mandea and Mindruta, 2002). Another interesting aspect of GAMECAST is the possibility to use the system for research on social behaviour and spontaneous collaboration emerging out of the game communities' experience. GAMECAST offers a chance for game developers to add new and attractive features to their MMO Games and successfully penetrate this market. For TV producers it opens up new revenue sources that are already common for Massively Multiplayer Online Games.

References


