



Games and Gaming for Interactive Digital Television

Introduction and Case Studies

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Executive summary

This report focuses on the possibilities of convergence regarding video games and digital television. The report consists roughly of four parts:

First, there is a brief discussion about media studies on television viewing. These observations will be related to research on gaming as a form of media use.

Second, the interactive digital television (iDTV) peripherals (set-top box and remote controller) will be analysed in the context of gaming. The following question will be answered: what kinds of possibilities and restrictions do set-top boxes and remote controllers have as gaming devices?

The third part focuses on the question of game genres. An analysis of video game genres in relation to television gaming genres (such as game shows and quizzes) will be presented in order to answer the question: What are the generic types of games that are suitable for adapting to the iDTV platform, and the social practices associated with watching TV?

The fourth part will consist of case studies of SubTV Mobile Games, where mobile phone functions as the backchannel.

Finally there will be conclusions, which serve as the basis for future game concept design in the Future interaction Television (FiTV) project. Conclusions will point to the hybridity and cross-media nature of iDTV gaming.

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1. Introduction

This report focuses on the possibilities of convergence regarding video games and interactive digital television (iDTV). As a cultural form, television has developed programme formats and habits of viewing that are not necessarily easy to adapt to the respective practices that have emerged around playing video and computer games, i.e. gaming. Still, television is often viewed in a social setting. Therefore it is relevant to think and conceptualise the ways in which television might adapt gaming practices and forms, especially when iDTV promises to enhance the TV viewing experience by making it more concretely interactive in nature.

Game-wise, our focus will be specifically on game content and genres familiar from game consoles (instead of the PC), as the various generations of consoles and games have been played on television sets, and within the social space it occupies, since the 1970s. We will here produce a compact outline of certain points of convergence between these two media: First, we will briefly discuss general research findings on the use and role of television in individuals' lives and relate these observations to research on gaming as a form of media use. Second, we will take a look at the iDTV peripherals in the context of gaming: what kinds of possibilities and restrictions do set-top boxes and remote controllers have as gaming devices? Then, we will look at various game genres, and with the above contextual factors in mind, analyse what would be the TV gaming genres, i.e. types of games suitable for adapting to the iDTV platform and the social practices associated with watching TV.

These general premises will be followed with case studies on present forms of gaming via television. We will evaluate and analyse the 'SubTV mobile games', i.e. games broadcast on Finnish television and played via the mobile phone. In the research project's future stages, the case studies and general iDTV gaming theory will be integrated into design principles for work on iDTV game concepts.

2. Social contexts of iDTV gaming

It is not the purpose of this report to review existing research literature on TV viewing extensively. Therefore we will take, for the most part, advantage of the findings from one major research project (Gauntlett & Hill 1999), and the interviews conducted within the FiTV project¹ (Ermi & Sotamaa 2003).

¹ Information about the FiTV project:
<http://www.uta.fi/hyper/projektit/fitv/>

2.1. Active gaming vs. passive viewing?

The first problem of trying to embed gaming practices into television viewing practices is that the two activities are different in nature. Gaming is (at least supposedly) more 'active', i.e. the players are constantly engaged in playing the game, often in a physical sense as well, whereas television viewing has been regarded 'passive' in the sense that it does not include similar senso-motoric activities, and that television viewing does not involve a great deal of concentration. Moreover, watching television can be incorporated into other household activities to function as 'electronic wallpaper' (one of the metaphors that TV viewers tend to use in describing what television means to them; see Gauntlett & Hill 1999, 112). The point here is that one cannot adapt a similar attitude towards a video game, as it requires more or less constant attention. Along these lines, Stuart Nolan (2002, 64) writes: "iDTV games are used as a supplement to the primary activity of watching TV. Games are *dipped* into during lulls in compelling viewing and *fitted* into ad breaks and spare moments while waiting for the favorite show to begin."

However, despite numerous characterisations of television viewing as an unchallenging and passive activity, the active–passive distinction is not as clear-cut as it would seem. Analysing the role of television in everyday life, Gauntlett and Hill note that generally research findings clearly indicate that the ways in which television viewing is part of individuals' everyday life vary from household to household. They conclude that TV viewing patterns are not standardised and generally watching television is not a passive activity. (Gauntlett & Hill 1999, 23.)

These kinds of differences would indicate that, on one hand, there is a considerable threshold to introduce game-like activities within television viewing practices. On the other hand, they do open up possibilities for 'hybrid' gaming concepts where programme formats and TV shows are enhanced with game-like features that do not necessarily prevent the viewer from 'traditional' viewing, but if she so desires, the viewer can engage with the competitive game aspects of the

show. We argue that the central challenge and goal of iDTV game design is to create concepts that host different mind-sets, i.e. both the television viewing mentality and the gaming mentality – and most importantly, the grey area in between.

2.2. ‘I should be doing something else’

Another aspect of television consumption that needs to be addressed in relation to gaming is the way in which TV viewing relates to transitional stages in individuals’ lives. Gauntlett and Hill (1999, 108–109) note that especially young adults are very aware that their taste in TV orientates towards what is conceived as more adult-orientated programmes during the transition from school and studies to working life. Without doubt, similar variations in taste occur in relation to gaming preferences.

This might lead one to conclude that young adults are actually not one of the potential audience segments for iDTV gaming, or at least they would desire more ‘mature’ iDTV gaming content than recycled classic videogame designs (*Tetris* etc., as stand-alone applications in the set-top box). Also, ‘non-video game generations’ would fall outside iDTV gaming audiences, although a considerable portion of elderly people do play card and board games.

In practice, these observations point to hybrid concepts that merge television narrative and its structures to game structures in a fresh and innovative manner – in other words, re-invent the relationship between television programme flow and existing viewing practices. This is possible by embedding gameplay sequences within or parallel with the programme flow, or to another medium (such as the Internet or mobile) altogether.

Both Gauntlett and Hill’s study and the FiTV user study (Ermi & Sotamaa 2003) indicate that there is a strong tendency among TV viewers to have the feeling that they should be doing ‘something else’ than watching television, and often there is a feeling of guilt associated with personal programme preferences and tastes (Gauntlett & Hill 1999, 123–128). On the other hand, television programme flow allows it to be lowered down to secondary or even tertiary activity. This is a practice that has emerged, at least partially, to prevent the feeling of guilt and ‘uselessness’ that grows out of extensive viewing. Generally, there is even stronger social guilt associated with forms of gaming (especially video gaming and gambling), which serves to remind that interviewees might not admit playing games or having an interest towards them when questioned about the subject. Alternatively, they might show interest towards ‘traditional’ forms of gaming (board games such as chess, quizzes, and so on), but do not see how they

could be incorporated into their existing television viewing and playing habits.

2.3. Social interaction within games

Overall, these are not the largest social obstacles to iDTV gaming. They are to be found in general conceptions regarding gaming. It was indicated in the FiTV user study (Ermi & Sotamaa 2003) that television is not really seen among the viewers as a gaming device, at least as of yet, even though different game and quiz show programmes have a long television broadcast history. This fact relates to the different roles and possibilities for action that the 'active' gaming vs. 'passive' viewing audience have. Still, there were signs among the interviews that viewers often take part in the quizzes independently, i.e. even if there are no specific features in the programme itself to support audience participation. Therefore, the main challenge for iDTV concept design is how to provide interaction and game structures within the programme concepts that take the audience into account in a more concrete yet subtle manner.

It is important to reflect the research findings on what television means for individuals, and how they use and wish to use television, in light of potential points (grounded on research) of convergence between the pleasures and desires of TV viewing and gaming. One notable observation is the fact that a considerable segment of viewers regards television as a companion or friend, and according to the interviews, certain programme types (such as sports and movies) are preferred and more enjoyable in a social setting among friends and family (Gauntlett & Hill 1999, 115–119; Ermi & Sotamaa 2003). This opens up fertile ground for multiplayer concepts that also feature communication functionalities to encourage social interaction (such as chatting about an on-going show or the game associated with it).

In the case of a game, this possibility for interaction can transform into strategic importance in relation to one's success in the game – i.e. players can plan collaborative strategies, ask for hints, etc. Additionally, such functionalities can be provided for players who wish to find opponents. These are basic elements of community design, and they are practices and functionalities that have existing online and game implementations, but the lessons learned from them must be adapted carefully to iDTV concepts with the specific nature of television viewing practices in mind. There are also the technical differences in, most notably, input devices (remote controllers vs. keyboards, mice and gamepads and their possible combinations). These will be discussed next.

3. IDTV technology and gaming

With iDTV technology, we refer to the essential end-user peripherals: the set-top box and the remote controller that is bundled with it.

3.1. The set-top box as a gaming platform

So far, there is lack of studies about set-top boxes as gaming platforms due to the fact that iDTV has not been introduced yet in many countries. The best examples come from Britain where in 1991 Videotron started to offer games as a part of their services in the London area. These games were mostly versions of well-known puzzle and board game concepts. (Nolan 2002, 60–61.) Different kinds of betting and voting systems have also been implemented.

So what actually is a set-top box, or a “digital hub”? It is a system that most of the developers are claiming should be able to record video and audio and store still photos from various sources, including your personal CD library, broadcast TV, and the Internet. They would also be likely to be able to store and play videogames. Media file management with different kinds of play modes will possibly be also included. Well, so far there aren’t any of these wonders to be purchased, but probably in the future there will be. For now on it’s very difficult to say if this is the true way that digital television development is about to take.

In order to develop a technological base for iDTV gaming, the availability and bandwidth of the backchannel is crucial. It is the necessary element when designing games other than stand-alone, single player versions of video game classics. There have been TV gaming programmes (such as Hugo Troll in the late 1980s, originating from France) that have taken advantage of cordial telephone lines in order to produce a game show where one audience member could play the game in real time in live broadcast. Also mobile phones have been taken as a backchannel for different kinds of gaming concepts from voting and participating in gameshows to playing videogame styled games television programs.

One of the main problems is also the fact that television sets do not have enough memory or processing power to stay up with the videogame industry and gaming consoles like PS2 and Xbox, and Sony’s and Microsoft’s respective online strategies. However, there have been announcements on advancements on set-top box technology, e.g. Pace Technologies licensing chip technology that was used in the Dreamcast con-

sole by Sega, and Linux-based operating system implemented into set-top boxes by Nokia (cf. Nolan 2002, 68).

But whether or not the set-top box is truly becoming the home entertainment centre, the notion about viewing cultures is more important. No matter what technological things set-top boxes will include, television will still be used for watching broadcast TV shows and programs and that's something that people want more than interactivity or stunning high tech abilities. Changes happen slowly and that is one thing that should be kept in mind while designing iDTV concepts.

3.2. The remote controller as a gaming peripheral

It is obvious that the remote controllers of today are not very suitable for video gaming purposes. They do not have pads or sticks allowing multi-directional control. At most, present remote controllers have directional buttons, yet two buttons cannot be used simultaneously in combination. Thus, diagonal directions, which are often necessary for video gaming purposes (such as controlling a character), are not available either for players or designers.

Additionally, there is usually only one remote controller per television set or set-top box, whereas for video game consoles it is customary to purchase at least the second gamepad for multiplayer purposes. There is also the fact that controlling the remote controller relates to domestic power relations (such as gender and age, see Gauntlett & Hill 1999, 241). Who controls the remote? In light of iDTV gaming, obviously the one who is playing should have access to the remote controller.

These limitations establish certain preconditions for iDTV gaming concepts. The game's interaction and gameplay patterns must be such that they are easily executed with the remote controller buttons (e.g., four color coded buttons if available). What also has to be taken into account is the (short, yet significant) lag between the remote controller and the receiver, and consequently the game. These are questions of so-called functional playability (see Chapter 5). In theoretical terms, the 'orthogonality' (Dietrich 2002) of iDTV gaming peripherals, and the respective control schema must be as simple as possible.

The preconditions have to do with the formal structures of games as well. Game rules are one of such structures that organise gameplay into patterns. In *Pac-Man*, for instance, the gameplay pattern consists of moving the *Pac-Man* character around, eating the pills and avoiding the ghosts. Gameplay patterns relate directly to the complexity/simplicity of the controller, and vice versa. We do not presume that iDTV viewers would be willing to purchase additional or specialised re-

mote controllers for gaming purposes. Therefore, turn-based games represent a rule structure that acknowledges the fact that only one input device might be available to the players.

In their present forms of television games and trivia, ways around these limitations have been sought. In Finland, a SMS (Short Message Service) message via mobile phone has become the 'back channel' that is used to take part in the game. It has also been a means to implement revenue logic into such entertainment concepts.

Based on the restrictions, we suggest the following conclusions: Instead of controlling movement (as in guiding a game character across the screen), it would be more appropriate for the iDTV gamer to 1) make choices between pre-defined multiple options, and/or 2) to control the timing or sequence of things, i.e. pressing buttons in the right time or right sequence. These gameplay patterns point towards certain kinds of games, i.e. representatives of specific game genres.

4. IDTV gaming genres

'Genre' is a conceptual tool with which to categorise and classify an existing field of products – in this case, to discern both similarities and differences between the vast amounts of different digital games. Although the question of genre is largely unexplored in the young field of video game theory, in game journalism certain genre thinking has been promoted ever since the first console and PC generations and their respective games.

For the purposes of this paper, it will suffice to present a rough draft of established video game genres. The genres are *action*, *adventure*, *puzzle*, *role-playing*, *strategy* and *sports*. To give some examples, action games include such shooting games as the popular *Doom* and *Quake* series, but also such classics as *Pac-Man* and *Super Mario Bros*. The most famous puzzle game is probably *Tetris*. *Civilization* is probably the most popular strategy game, and the adventure genre has such well-known games as *Myst* and *Secret of the Monkey Island* series.

Game genres have to do with both the form and content of games. Action games not only tend to have different challenges, characters and environments than strategy games, but also different control schemes as well. Therefore the two genres produce different gameplay patterns that have to do with, e.g., the tasks and challenges the player has to accomplish and also tempo in which this happens (for more, see Järvinen, Heliö & Mäyrä 2002). For example, the gameplay patterns that emerge during the gameplay of *Civilization* (strategy) are more slow-tempoed than the hectic ones emerging during playing *Quake* (action). The gameplay patterns in these two genres also require different sets of skills from the players – the strategy game emphasises abstract thinking whereas the action game puts the player's senso-motoric skills into test.

The following is presented as a rule of thumb: the more features and functionalities, the more complex the control scheme, and thus, the more specialised (or open to customisation) the gaming controller has to be. The complexity of a flight simulator game, which simulates most functions of an aeroplane, requires a complex controller in order to be playable. An example from the other end of the spectrum is a puzzle game like *Tetris* that requires only four functions to be mapped to the controller: rotate the block, move the block left & right, and pull the block down. It is a control scheme of such low orthogonality that it can be mapped into television remote controllers as well.

4.1. TV game genres

The question goes: which of the video game genres are adaptable to iDTV, both regarding their technical implementation and their adaptability to the nature of television viewing for entertainment purposes? What game genres (outside the video game genres introduced above) the television itself has fostered?

4.1.1. Trivia

Let us begin by answering the later question. Television has a long and popular tradition of quiz shows where the contestants are presented with trivia questions. We call this TV game genre *trivia*. Characteristic of this genre is the fact that trivia allow 'playing outside playing', in other words the viewers can independently try to guess the answers or perform the tasks and relate their success to the contestants in the actual broadcast. In fact, the company Two Way TV introduced set-top box solutions in the late 1990s where the viewers could play along with quiz shows, for instance. There were also multi-player concepts within households where scores could be sent back (via a modem backchannel) to be compared with other households (Nolan 2002, 62). 'TVScrabble on Challenge?' presents one such example.¹

¹ More information:
<http://www.broadbandbananas.com/vvgames.html>

4.1.2. Games of chance

The second specific genre of games that has been played in connection with TV broadcasts is gambling. In Finland, especially the weekly lottery draw has become an institution that momentarily organises the structure of domestic life during Saturday evenings. Lottery and other forms of gambling constitute another TV game genre, *the games of chance*.

It is characteristic of this game genre that it is based on luck: the pleasure of playing arises from the drama of waiting to see if one has won, while at the same time being unable to do anything to affect the outcome (Järvinen & Sotamaa 2002). This is directly in opposition to most video games where the point and source of pleasure is specifically the fact that the player exercises control over the game events and tries to do her best to win or succeed.

These two TV game genres operate within what we have chosen to call the 'game show paradigm'. It serves to indicate the difference of television gaming to the distribution and consumption of video games. The latter mostly operates on the basis of stand-alone products without having to do with the temporal framework of television (programme schedule, a certain weekly/daily time slot, and so on). This points to another aspect of the hybrid nature of iDTV gaming concepts:

iDTV games can be designed to be independent and/or dependent on the programme schedule.

4.2. Scalable video game genres

What are, then, the video game genres that are potentially adaptable to iDTV gaming? To answer this question, we must take the limitations of the iDTV gaming devices (set-top box, remote controller) into account and search for game structures that are able to function adequately within the limitations.

Examined from this perspective, three video game genres emerge: strategy, adventure, and puzzle. A typical structure of a strategy genre game consists of individual turns for the players. This is, of course, a structure familiar from numerous board games, but with digital games, it has taken a turn towards more real-time action. However, if there is only one input device available for the iDTV player(s), the sequential turn-based structure becomes the only option within individual households. Multi-player concepts between iDTV gamers 'online' can be designed to host both structures. Or, alternatively, concepts that expand to multiple platforms, so that there exists a number of interfaces to play the game.

In the adventure genre, there is a tradition of puzzles and pre-scripted game events that are designed as tasks for the player to complete. In simple form, these structures can be adapted to the restrictions of iDTV peripherals. Moreover, examples of such gameplay patterns are to be found in popular video game designs: *Dragon's Lair* (Dragonstone software 1983) was a popular adventure game where the gameplay was entirely based on the player having to complete sequences of button presses and control stick directions. A more recent example is *Shenmue* (Sega 2000), an ambitious adventure game which had so-called 'quick timer events' that functioned exactly like the gameplay in *Dragon's Lair*. By pressing the gamepad buttons (indicated as flashing button icons on the screen) in the right sequence and rhythm, the pre-scripted fight or chase sequence was completed and the player was able to advance in the game.

In addition, there is a subgenre of action games that is based on similar gameplay patterns and challenges: the so-called Japanese 'bemani' games, i.e. dance and rhythm games such as *Parappa the Rapper*, the *Beatmania* series and *Dance Dance Revolution*. These games challenge the player(s) to press buttons to the rhythm of different music. Moreover, this subgenre has emerged as highly social in nature, which furthermore makes it favourable to adapt to iDTV purposes.

4.3. Towards hybrid iDTV gaming genres

As noted, puzzle games are often simple enough to be implemented for the iDTV platform, and many *Tetris* and other clones of classic concepts are indeed found as part of various iDTV services (Nolan 2002). There will most probably be the tendency to introduce 'downgraded' versions of popular concepts for the remote controller and set-top box limits. A similar trend is very visible in the development of mobile games.

From the perspective of the FiTV project, this kind of recycling is not very interesting. The 'future interaction' of television will, game-wise, take the shape of hybrid concepts where gaming is incorporated into the programme stream and also shapes out according to it, i.e. the events in a television programme influence gameplay and vice versa. One of the advantages of television as an 'old' technology is that it has the potential to offer different games and gaming platforms for audience segments that have so far been non-gamers in the context of digital technologies.

For instance, the FiTV user study (Ermi & Sotamaa 2003) indicated that elderly people are, at least in principle, interested in iDTV gaming in relation to their 'non-digital' gaming habits (playing traditional board and card games, such as Chess and Bridge). Still, these present only preliminary and limited findings, and much research is to be done on the needs and formations of future iDTV gaming audiences. One of the most important methods of looking into these matters is concept design and prototype testing.

5. 'Playability' and 'gameplay' in TV context

In this paper we will be using the methodological approach by Järvinen, Heliö & Mäyrä (2002, adapted from the CC-DES project that has functioned in close connection with the game subtasks of the FiTV project). In the study, a four-fold model of playability was developed in order to analyse digital entertainment and games. We will adapt the theoretical framework to analyse existing TV gaming concepts.

Gameplay refers to the time period during which the player interacts with the game, i.e. it equals the duration of a game imposing its rules on the player. "During gameplay, the player is able to develop skills and strategies to work for the game's goal(s) within the rules." (Järvinen, Heliö & Mäyrä 2002, 16.)

Playability is one of the most common terms used to describe the quality of an individual game. For purposes of analysis, the term has not been useful, as it has been mostly used in gaming magazines without a basis in systematic research. We use playability as a qualitative term to describe and evaluate the interaction between player and the game. According to Järvinen, Heliö & Mäyrä, it is "a collection of criteria with which to evaluate a product's gameplay or interaction". Thus, playability is 1) a set of guidelines regarding how to implement the necessary elements (such as rules) to give birth to a desired sort of gameplay, and 2) an evaluation tool and research discipline in the field of digital entertainment in similar fashion as so-called usability regarding software, applications, and human-computer interaction in general. (Ibid.)

The evaluation model produced in the study is based on adapting the notions of 'flow' and 'optimal experience' (discussed by Psychologist Mihail Csikszentmihalyi) into a 'game flow' framework that works as a research tool for evaluating the general quality of digital entertainment products and concepts (such as games, chat environments & applications, or digital toys).

In the model, these criteria are introduced as four components – functional, structural, audiovisual, and social playability – with which to conduct the evaluation. The model allows flexibility in the sense that different leverage can be given to the components regarding the game or entertainment product that will be taken under evaluation. For instance, if the product to be evaluated is a game for single player only, it is not relevant to focus extensively on 'social playability', i.e. the social practices and settings (such as communication), but rather the other components, in the order that is deemed

relevant for what the game tries to accomplish and what kind of audience(s) it is targeted at. We will introduce the components briefly and discuss their use in the iDTV context. After that, the conceptual tools will be put into practice in the case studies of mobile television games.

- **Functional playability** has to do with “control mechanisms and their relation to gameplay” (ibid., 27). In practice, this means that the functional aspects have to be related to the technical peripherals (set-top box, remote controller) discussed above.
- **Structural playability** is used to evaluate the rule structures that shape up the gameplay patterns, which emerge during playing the game (ibid., 28–29). It can also include analysis of game logic and mathematics and/or narrative structures that are carried out within this component. The CC-DES study has produced a generic structural model of user experiences in digital entertainment, and we will use it as a tool for evaluating the player experiences that ‘mobile TV’ games give birth to. A specific question of structural playability in the iDTV context has to do with hybrid and multi-platform concepts where the game is embedded in the programme flow, and possibly a specific show. In cases like this, the structures that connect the viewing experience with the player experience, and how they both are organised (i.e. designed) and how they emerge in the actual gameplay, are analysed. Is it possible to incorporate “classical playability” from the world of video games into television broadcast and programme structures – and if so, how can it be done effectively?
- **Audiovisual playability** has to do with the graphic and sound design of a game. In the field of video games, there are various approaches to implementing an ‘audiovisual style’ for a game. The audiovisual style is built from certain elements, such as dimensionality, which can be two-dimensional, isometric, or complete 3D. (For a thorough discussion on the audiovisual styles of digital games, see Järvinen 2002.) In the iDTV context, this has especially to do with the technological capabilities of the set-top box, and the limitations that the remote controller presents. In connection with analysing the audiovisual quality of a game, and how it relates to certain general styles, it is crucial to study the audiovisuality in relation to the functional aspects of playability. A relevant question, for instance, would be whether complicated control schemes that 3D game environments often require are appropriate with the remote controller in mind, or how its restrictions can be designed to host such audiovisual approach. The sound design of a par-

ticular game can successfully enhance its atmosphere, and sound can also function as feedback for the player's actions.

- **Social playability** focuses on gaming as a social practice and what kind of game features the players would desire in this context. What are the functionalities required to support social interaction in gaming contexts? In the iDTV context, social playability is especially relevant with multi-player concepts. How to transfer practices familiar from, e.g., board games to the television setting? Social playability also refers to online practices (such as 'lobbies' on Internet game servers where players can look for opponents) and analysis focusing on whether they can be brought into the television-viewing context or not.

Watching television has been a social practice and so have been many forms of playing, too (e.g. board games and console games). Generally, it has been argued that watching others play games is not as interesting as playing them oneself. Still, watching others play and waiting for one's turn can be an important part of the shared experience and fun. It is also a lot more interesting to watch someone familiar and/or a good player to play or to see two or more individuals to play against each other while they are all at the same competence level. In a social gaming experience, participating and communicating can become more important and enjoyable than the formal distinctions brought about by the rules, such as who wins and who loses. The point is that in this way, iDTV gaming can provide different roles for individuals taking part in the game, i.e. one using the remote controller while others solve the puzzles, and so on.

6. Case studies of mobile TV games

The case studies include three games that have been aired on the SubTV channel in Finland during the year 2002. These games have been chosen as the cases because they present the most inherently video game like television content at the moment, regarding both their audiovisual form and interaction structure. Even if they are not iDTV games as such, analysing them and relating their features and functionalities to iDTV platforms and peripherals helps in discerning structures appropriate for 'proper' iDTV gaming.

The games are quite similar to each other, much due to the link of television broadcast and mobile phone as the back-channel. This allows us to analyse their functional, structural, and social playability together. The fact that really only their audiovisual implementation differs serves to show that similar formal game structures can be 'disguised' into different game brands with different sounds and graphics. Before going to the analysis, we will describe the games shortly.

6.1. The games: *Katapultti*, *WaterWar*, and *Bumper Cars*

Image 1: Screenshot of *Katapultti*.



¹ More information:
<http://www.sub.tv/ohjelmat/kaikki.shtml?106374>

Katapultti (Catapult)¹ is played in a pre-historic setting with cavemen and dinosaurs. The player sends a SMS with her (nick)name to take part in the game. After that, she is assigned a catapult into a random location on the game field, which is represented as a desert. The player is assigned into one of the two teams that try to shoot each other with rocks

using the catapults. The player has to aim by sending the direction and distance of the shot with a SMS message. For example, a message 'k 180 50' sends a rock flying in the direction of 180 degrees on the map, with the distance being 50 (there is both a compass and a distance meter displayed on the game field to help the player with aiming). Successful hits give points to the shooter and the hit ends the game for the player whose catapult was destroyed. The game is structured into 8-minute rounds. When the round ends, three players with most points are rewarded with an animation showing them celebrating on a podium before the next round begins. Overall score leaders and daily high scores are recorded and displayed in between the rounds.

Image 2: *WaterWar*.



¹ More information:
<http://www.waterwar.tv/>

*WaterWar*¹ is a game involving two teams fighting each other with water guns. As with *Katapultti*, the player sends a SMS message with her (nick)name to take part in the game and she is assigned into either the red or the blue team. The teams start the round on the opposing sides of the game field and set out to shoot each other out of the game. The field has a grid structure and objects that make shooting and moving more challenging (obstacles such as bushes and buildings, and mines). There are also health packs and more powerful weapons to pick up. The player sends combinations of specific direction (the '2', '4', '6', '8' buttons of the phone, and consequently the letters A, M, T, and G when writing a text message) and shooting commands (button '5', letter J), with a message consisting of 10 characters at maximum. Her character then acts accordingly on the game field. A successful shot depletes energy from the opponents. The amount of damage depends on the type of weapon used. Once energy runs out, the player is out of the game – however, she can return if

there is time left in the round. A game round lasts 7 minutes, after which the results (team and individual scores) and high scores are displayed.

Image 3: *Bumper Cars*. Note the arena hot spots indicated by numbers and the cars with the alphabets.



In *Bumper Cars*, the player sets out to drive in a destruction derby with cars that resemble bumper vehicles found in amusement parks. The login procedure is similar as with the two other games, but besides choosing her nickname, the player is able to choose from six different vehicles. The game field is a circular arena that has 'hot spots' marked with numbers. These function as waypoints for the drivers when sending their driving directions with a SMS message. The drivers are assigned an alphabet, which functions as a waypoint as well: when wishing to hit another player with one's car, one must send a message containing the alphabet of that player. If the player's vehicle sustains too many hits, it explodes and the player is out of the game. As with *Katapultti*, the game is structured into 8-minute rounds and afterwards there is the podium celebration and the high scores on display.

6.2. Playability notes and analysis

The gameplay of *Katapultti*, *WaterWar*, and *Bumper Cars* consist of entering the game, viewing the broadcast and sending SMS messages (via a mobile phone) with special syntax that affects the gameplay in a certain fashion. The games' structure is roughly the one of real time strategy – not quite real time, however, as the sending of text messages inevitably imposes a certain temporal lag on the gameplay pattern.

6.2.1. Functional playability

As the mobile phone functions as the back channel, the degree of functional playability results from the actual practice of writing the messages and the syntax that is designed to convey the actions desired. In *WaterWar*, the solution to map the four directions on the mobile phone 'keyboard' (into buttons 2, 4, 6, 8) is an effort to make the syntax as intuitive as possible.

In the other two games, the syntax is based on the codes assigned to actions, objects and players within the game – the distance and direction in *Katapultti*, and the waypoints in *Bumper Cars*. These are efforts to lower the orthogonal complexity, and adequate to that, but the lag and overall complexity of text messaging remains part of the gameplay, and the player experience should be more effortless in order to be thoroughly enjoyable. In designing future concepts, it would be necessary to study (with playable prototypes) what kind of learning curve emerges in relation to these kinds of input/output mechanisms. They are, after all, crucial when one wants to enjoy and learn to play the game in the first place.

Another aspect of functional playability is how the players' commands are acknowledged. In *WaterWar*, each successful sending of a command is acknowledged by a reply message, which interferes with the gameplay, especially when trying to write another message with the next chain of actions. Since the player gets visual feedback of her commands, as she sees her character moving within the grid, the reply message is unnecessary. This is an example of how a functionality that conforms to basic *usability* standards can become a flaw regarding *playability*.

6.2.2. Structural playability

Basically all games analysed here have similar structure: send an SMS message in hope to affect the gameplay, the state of the game changes, send another SMS message in the context of the changed state, and so on. SMS messages impose a structure where there is a considerable lag, and sending one set of commands takes some time, at least compared with a solution where, with a remote controller, the task of separately sending the message could be cut out from the loop and the commands would be registered one by one, in real time.

With *Katapultti*, this generic structure takes the shape of shoot–adjust–shoot, where the 'adjust' phase consists of re-aiming the shot that did not hit, or changing the target. As there is no chance to move one's catapult around, the pattern is rather too simple, as it does not empower the player in any other way than with the ability to shoot. As a result, the gameplay is characterised by 'who hits first' as every player is a 'sitting duck' with her catapult.

The effect on empowering the player with the ability to move around is demonstrated in *Bumper Cars* where the gameplay patterns are basically similar: move—observe—the-outcome—move-again. However, as the gameplay is based around moving rather than static shooting, the tempo of the game increases, and the SMS message lag does not affect the gameplay as much, as one can constantly send commands to move between the waypoints (the hot spots or opponent vehicles). The gameplay patterns are not as separate from each other as in *Katapultti*. On the formal level of the game structure, this is one step further towards real time. On the informal level of player experience, the tempo of *Bumper Cars* is closer to an average video game (in the action genre).

The distinctive feature of *WaterWar* is that its game fields are structured into grids, which function as structures that deliberately constrain the movement into certain possible patterns. The players can only move in four directions in the grid. This rule structure reduces the complexity of the control scheme so as to meet the restrictions of the controller (in this case, the mobile phone). Another rule that shapes the gameplay patterns in *WaterWar* is that the shots carry only five grids in distance. This effectively encourages movement in order to reach shooting distance, and makes the gameplay overall livelier than in the static *Katapultti*. Also, due to the characters (in *WaterWar*) and cars (in *Bumper Cars*) moving about, there emerges an element of chance: for example, in *Bumper Cars*, the planned route can take an unexpected turn if the player's car hits another, or it might be destroyed altogether.

6.2.3. Audiovisual playability

Both *Katapultti* and *Bumper Cars* are implemented in the so-called isometric perspective, whereas the game fields of *WaterWar* are represented in two dimensions, from a bird-eye view. In *Katapultti*, this choice of implementation (whether designed knowingly or not) somewhat increases the difficulty in aiming. In *Bumper Cars* (developed by the same company and running on the same platform) the isometric perspective allows the player to perceive the arena in its entirety. This helps in discerning the waypoints and planning one's routes between them. In *WaterWar*, the 2D top-down implementation serves a similar purpose.

The sound design of the games is almost non-existent. This is largely due to the lag as discussed above: there is no way to provide the player with instant aural feedback of her actions, and therefore the game sounds are largely 'decorative' sounds resulting from within the game world (such as the sound of the bumper car engines, and so on).

Each game has a toy-like and colourful visual outlook. Rather than trying to go for photorealistic imagery, their overall audiovisual style goes for caricaturism (Järvinen 2002).

6.2.4. Social playability

All the games analysed here are multi-player games. This fact makes them inherently social, but the more relevant question is whether social aspects of gameplay are encouraged in any other way than pitting the players against each other. The social dimension gets reduced to the competitive aspect only, and the minimal community features become trivial. In both *Katapultti* and *WaterWar*, there is a team aspect to encourage an 'us versus them' team spirit, but in the end this aspect remains random: there are no functionalities to support teamwork which leads to the fact that, in practice, every individual player is playing for themselves, not for the team. The team feature ends up being a way to distribute the participating players evenly on the game field.

There is a single community-enhancing design solution in each of the SubTV Mobile Games: besides the gameplay message syntax, one can send chat messages. However, during the test period for this report, the chat functionality was mostly unavailable. This is probably mostly due to the fact that in order to play the game successfully, there really is no time to chat because of the cumbersome task of writing the directly game-related SMS messages. Therefore the social aspects of these concepts are reduced to possible mutual gameplay sessions between friends around a common television set. More spontaneous and varied sense of iDTV gaming community would require specific functionalities and enhanced programme features designed to encourage social interaction.

7. Future interaction TV gaming: cross media genres and concepts

We have argued that iDTV gaming will be hybrid in nature. We have demonstrated that iDTV gaming has potential to combine elements from 1) genres across digital and non-digital games, 2) narrative and game-like structures, and 3) user practices associated with different media technologies from television to mobile phones. Especially the third aspect opens up possibilities for different player types and segments to take part in a game with different interfaces. Moreover, their motives and mind-sets might be different: some looking for games with narrative enhancements, the others looking for narratives with game-like enhancements.

Cross media interfaces also present possibilities for television consumption to reach out from domestic spaces, at least temporarily. Production-wise, this means increased complexity in designing the concepts to work within different platforms and contexts, and the issues of 'playability' do not become any less important in order to be able to produce meaningful iDTV gaming experiences. For example, studying the structural component of playability reveals that the present iDTV game concepts are structurally rather too simple and generally content with keeping the game and viewing experiences separate.

In order for more complex forms of iDTV gaming phenomena to develop, it would require steps from various players in the field: the hardware developers (producing more advanced set-top boxes), television production companies (introducing hybrid concepts) and viewers/gamers (willing to engage in the games on offer and moving on to produce their own material to complement existing commercial products).

Designing game concepts that simultaneously host different mind-sets will be one of the premises of our concept design. We aim to conceptualise the variables and factors (TV programme flow, gameplay patterns, etc.) that affect 'iDTV gaming situations', and produce tools that help in designing concepts that take the hybrid nature systematically into account.

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