On the development of a mobile play mechanic[1]

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Abstract:

Mobility as a genuine game feature is changing everything: the playground, the position and the role of each element in the game, the activity and the experience of the gamer. Starting and reference point for the theoretical considerations in this article is the development process of the mobile game 'Gangs of Bremen' conducted by several students and a teacher at the 'Hochschule Bremen', university of applied sciences in Bremen, Germany since March 2003. We present and evaluate the concept of the first phase. We then examine the theoretical and practical issues included. Dealing with the questions 'what is a mobile game' and 'what language do we need to talk about mobile games' we discuss interactive storytelling and the game-design-pattern-language. Finally we proceed to a reduced and condensed version of the concept, a mobile play mechanic, which enables mobile gaming in the near future, instantiates the gamer as producer and allows the move of the territory to the city of Bremen.

Keywords:

Mobile gaming, gamer as producer, playground, interactive storytelling, play mechanic, pattern

Introduction

'Gangs of Bremen' is a mobile game we started to develop at the Centre of Computer Science and Media Technologies at the 'Hochschule Bremen', university of applied sciences, in Bremen, Germany. The mobile communication- and multimedia technologies enable the players to experience complex situations of learning and playing locally anchored, and interacting with their own physical and virtual environment. The project-group 'Gangs of Bremen' is using these technologies to combine virtual and real game sequences in one seamless integrated game. In this paper we are concerned with conceptual and development issues of mobile gaming. Starting and reference point for our theoretical considerations is the development process of the mobile game 'Gangs of Bremen'. In March 2003 some students and the authors got together with the idea to start a

project on mobile game development, which allows students and teachers to work in one project consistently over time and across the frontiers of different academic subjects[2]. Now one year later, we finished the first project phase. The lesson learned in general, mobility as a genuine game feature is changing everything: the playground, the position and the role of each element in the game, the activity and the experience of the gamer. We need a deeper understanding of mobile games. The complex project demands division of labour and parallel processing - we only can handle that under our conditions with much more clarity. The theoretical issues at the core of our considerations are 'what is a mobile game?' and 'what kind of language do we need to talk about mobile games?' and after all 'what does this mean in the case of the 'Gangs of Bremen'. We have to understand, to grasp and refine the logic of our mobile game. What we are heading for is the *play-mechanic* that means the core of the story and the functioning of this core as a mobile human-computer-interaction-unit. We are in the situation of *making a mobile play mechanic* and it is that, what we want to talk about within three steps: First we present goals and results of the first developmental phase of 'Gangs of Bremen', second we will deal with the theoretical issues of mobile gaming, relevant in our current state; third we present the core of our game-idea and the necessary next step of the development.

'Gangs of Bremen' – first phase of the development

The project 'Gangs of Bremen' started in March 2003. About fifteen students and one teacher worked about three month together to invent the concept and the design of an engine. In the following six months six of the former students, the teacher and an assistant worked together to create the plot, a prototype and the module-design of the game-engine.

Goals

In March 2003 we declared the development of a *mobile situated* game as our goal. *Mobility* of the gamer we thought to be a feature of the game. And we wanted to attain this goal by means of the concept of a *situated* virtual world and the according method of situating. We thought about a virtual world of the game, which is not separated from the real world of the gamer as it is in the traditional computer game, but which is by different relations locally anchored within the real world of the gamer. The anchors of the virtual world within the real world we wanted to discover by the method of *situating*. In 1987 Lucy Suchman presented a concept of human actions, according to that actions are not primarily the execution of an idea, a pre-given plan or template, but enfold within the unique situation of a singular human being acting, a situation which neither we nor this

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[2] The collaborating students are till now Hans Hamm, student-project-manager, Katja Fahrenholz, Claudia Glomb, Jochen Hahn, Andreas Jonderko and Dietmar Pichler.

human being can predict exactly in the forerun. Suchman initiated a paradigm shift in the way of looking at human actions, instead of looking in a rationalistic way she made a plea to pay more attention for the emergence of actions within the situation of the actor. If you transfer this idea to the concept of virtual worlds in computer-games and think of situated virtual worlds, which are related to the real world of the gamer, than you have a novel method to develop the game-idea and to discover the game potential within the connection of virtual and real world. The mobile game to be is the 'Gangs-of-Bremen', located in Bremen, Germany, basing on the energy and dynamics between youth groups on the streets in Bremen. The 'Gangs of Bremen' addresses youth-groups, which exist by institution as for example students or which get together as individuals spontaneously by neighborhood. The playground we thought to be a combination of the real territory of Bremen and a 3D photorealistic replication in the virtual space, enriched by several dimensions, which go beyond the realistic part and underline for example emotional aspects of the gamers activities or historical aspects of the territory. As the first step we designed a prototype 'Gangs of the ZIMT' we thought to be appropriate especially because of the manageable endeavor to create the graphical world and the less complex real world of the ZIMT

Results

Now one year later, we finished the first project phase within two steps a summer-part-project, three months, and a winter-part-project, six month. The results of the student work are a) a mobile game concept, b) a plot, c) a simulation of game-mechanisms, d) the module-design of the game engine and d) the accordant work packages. In the fall my colleagues[3] associated themselves to the project. In the winter they took the role as review-experts on the fields scripting, engine, networks. In the next phase we will re-organize division of labor within in the project and define part-projects. In this paper I present and discuss the game-concept.

The mobile game concept

The game-play is as follows: The *objective* of the game is to conquer the symbol of power. The symbol is protected by security mechanisms that define the quests for the players. The gamers are organized in gangs. The members of each gang collaborate in mastering a quest. The gangs compete with each other in obtaining the symbol of power. The *playground* is a combination of a real world and a virtual world. The *real world location* of the prototype is the ZIMT, the '**Z**entrum für **I**nformatik und **M**edien**t**echnologien' or in English, the 'Centre of Computer Science and media technologies', a huge building, with five floors. The architecture of the building as a whole is like a quarter of an arc of a circle. On each floor there is a long hall running through the building, from where you can

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reach all other rooms: Halls for lectures, rooms for exercises and student projects, rooms for conferences, laboratories and offices, a cafeteria, a kitchen and a student lounge. The *virtual world* is a 3D-replication of the real world. The virtual ZIMT basically has the same architecture of the real existing ZIMT but has some modifications in the extension and the equipment of the rooms.

Before I further outline the concept, I start with the plot the students developed for the prototype. The *story* around the 'Gangs of ZIMT' is told as follows: Sometime in our time coworkers of the ZIMT have developed a powerful computer named G1. G1 was a self-teaching computer that gained more and more intelligence the longer it existed. Nobody ever doubted to lose control over G1, but by the time G1 developed a virus that did not only infect other computer systems but was able to attach itself to viruses that strike human beings. It spread all over the world, people started nuclear wars with the effect that the polar caps melted away and the earth was flooded. By the time the power of G1 weakened and people came back to their senses. A group of students who had survived the war remembered a time machine that as well had been developed in the ZIMT and started to make plans to destroy G1 in the past. The military influence of G1 had still not faded and instead of working together the students were divided into several groups who competed to destroy G1. The *objective* of the 'Gang-of-ZIMT' is – according to the plot – to destroy G1, the symbol of power at the ZIMT. This of course cannot easily be done, because G1 is protected by security mechanisms. To deactivate these mechanisms riddles and quests have to be solved for which a cooperation of players in both worlds is necessary.

The *gamers* are organized in gangs. Each gang is a group of several students, each group is related to one study course at the ZIMT. At the ZIMT there are three basic study programmes: Media Computer Sciences, Technical Computer Sciences and a Women's Degree Programme 'Computer Science'. To be able to act more efficient through the game *players* are equipped with different trainable competencies like strength, endurance and intelligence. Successfully solving a quest enables the player to strengthen his competencies and indirectly the competence of his team.

The *time-sequence* of the game is defined by the mastering of quests to obtain the 'symbol of power': *first*: the gamers choose their role and define and train their competencies by solving quests. Doing so they build up the power of their gang at the same time. The growing power of each gang is embodied by the gang-totem and by the degree of influence on the ZIMT-territory; *second*: the gangs compete with other by solving quests one group against the other groups; they gain influence on the whole territory by conquering the symbol of power of the ZIMT, which incorporates the power of all gangs involved in the game. There are two strategies of conquest, the direct way to conquer the symbol of power and the indirect way to conquer the totems of the other gangs. According to the story, the playground is not only a combination of different spaces, but also of different '*time-zones*'. The *past* is the time before G1 had taken over the reign (but existed

already) and is represented by the real ZIMT. The *future* is the time after the war and is a virtual replication of the ZIMT. The *present* is the active game-play, where past and future come together. Gamers will experience different worlds located in different rooms and communicate via the computer they are playing at. The *devices* are PC and handhelds. The gamers in the real world are supported by an iPac (a mobile handheld), which allows receiving and sending quests and their solutions, communication with other team-members and an overview of their companions and other hostile players. The gamers in the virtual world use a desktop computer. Wireless LAN and Bluetooth realize the network. The *game-mechanisms* are based on the combination of the real and the virtual world: collaboration, orientation and battle. *Collaboration* between gang members is required to master quests. There is a division of labour between the members of the gangs. As an individual you can move, but you can act only within one world. You can switch between the worlds. You can go from the real to the virtual world and vice versa. But you cannot act within both worlds at the same time. To master a quest you have to collaborate with other members of your gang, who act in the other world and communicate with you. One part of the gang is sitting in front of a personal computer and moving within the virtual world. The other part of the gang is moving within the real world by means of a PDA. *Orientation* about what is going on in the other world is a necessary condition for collaboration and fight and is made possible by visualization. You are acting within one world, but you are informed about the position of the members of your gang and the other gangs in the other world. The members in the 3D virtual world see the movement of the gang members and of the enemies in the real world by the movement of lucent avatars. The gang-members in the real world see the movement of their gang-members and their enemies in the virtual world by the movement of dots on the 2D-map of the ZIMT. *Fight* with members of the other gangs is mediated by the virtual world. You can attack a gamer in the real world by attacking the avatar of the gamer in the virtual world. If you succeed the gamer in the real world gets the signal that he has to take a time out. The gamer in the real world only can evade or dash away. Counter attacks have to be conducted by those members of the own gang, who are moving within the virtual world.

Evaluation

We got the big picture of what we are heading for. We got a sense of the complexity of the venture. Looking at the concept with simultaneous consideration of the conditions of development, maintenance and gaming we discovered issues we will have to deal with, if we want to go further into mobile gaming by the development of the Gangs of Bremen. The concept of the mobile game we have worked out till now, is in this version far too heavy, far too massive, to serve as a guiding orientation for the development process within our research context or within any other context of development.

There are several difficulties we have to cope with. First of all, there is the problem of further prototyping. Second, the local territory is decisive for mobile-game-design. Third, there is the problem of funding the research and development

process. Forth, there is a predictive huge amount of costs of maintenance nobody can pay. We have to deal with these problems, if we want to succeed in developing this mobile game. (1) *Prototyping* is a condition of development to succeed on unknown fields. But our concept of mobile gaming in the current stage is too heavy and too massive for prototyping. There are too many assumptions we have to make over a much too long time, if we want this mobile game concept to be the orientation of our further development process. By prototyping you are able to take into account unforeseeable aspects of the game-play. You can specify or even redesign the concept during the development process. In our case we need the gamers experience, the gamers activity to understand, refine and develop our mobile game. *Mobile gaming* has literally to be a continuous assumption of the development process. But to spell our concept out and realize the game-idea actively as a game during the development process, we need a finished game engine. The development of our engine needs at least eighteen months, if not more. (2) The *territory* and the *actors* are decisive for the mobile-game-design. The idea to develop a prototype within the ZIMT was good for getting the big picture done. But for further development, we have to take into account the game potential, emerging by mobile gaming within the territory and together with the gamers. We have to relocate the concept within the territory of the city Bremen and in a certain way we have to play with the local actors we want to address in Bremen and to integrate the gamer as producer. The mobile game concept depends on the specific playground and on the gamers. Even on the technical level the territory is decisive for the further development of the game. Positioning techniques within one building are very different to the positioning techniques within the city of Bremen. In the former case we have to work with W-LAN, field-strength and Bluetooth, in the latter we will work with GPS, W-LAN and UMTS. (3) The *funding* in relation to the costs- and time-consuming development becomes apparent to be difficult. Funding of game development depends on promising interim results, but the engine-production needs that much time, that interim results, which are based on the engine, cannot presented in the early stage of the development, when we need funding. (4) The same accounts for the costs of *maintenance*. The game concept till now requires a quest-production-machinery as a condition of maintenance. Nobody can guarantee the payment of those costs. The methodologically next step we have to do: exclude all elements, which are not necessary within the elementary mobile game concept and develop a concept, which allows to deal with those issues above.

Theoretical issues of mobile gaming

Asking for the language we need to talk about mobile gaming first candidates are interactive storytelling and the 'game–design-pattern-language'. *Interactive storytelling* has a strong tradition leading back to the roots of our culture. Interactive storytelling is the situation, where we sit around the fireplace, or its modern successor, the TV. Within this approach you get an idea of creating an own *singular* world and the idea of both who interact in development of the game and in gaming, the storyteller, game designer, and the audience, the gamer who

has to be spellbound and abducted into the story-world and is as such an acting part of game design. In the transition from designing to gaming the gamer himself becomes a storyteller. In the first glance the interactive storytelling approach is focusing the uniqueness of the situation and the process of storytelling. The creation of the special atmosphere, the emergence of the specific game experience by the interaction and resonance between teller and audience is the goal of interactive storytelling, the development of the singular game solution, which is most appropriate for these special circumstances. Game design in this tradition is called an art. Game designers are artists and artists in the traditional view differ from industrial workers by the singularity of the production act. One game-designer and promoter of interactive storytelling is for example Chris Crawford, who joined Atari in 1979 and designed games such as Eastern Front - 1941, a game that became a bestseller. Managing the games research group at Atari he wrote 'The Art of Computer Game Design' (1982, http://www.vancouver.wsu.edu/fac/peabody/game-book/Coverpage.html). After the Atari crash in 1984 he worked as a freelancer and created the game 'Balance of Power', having been sold about 250,000 times. In the nineties he started to work on the 'Erasmatron' story-engine[4] (www.erasmatazz.com), a technology for interactive storytelling and a development environment that permits non-technical artists to control the technology. The engine includes for example a model of human memory that allows gossip, a model of microeconomics that allows haggling, a model of human personality that offers a range of possibilities of acting and reacting as well as options of traits, moods and social relationships (see above). Crawford's efforts show that despite to the traditional view the 'art' of computer game design accounts for a generalized structure and the according technology. By means of an interaction theory, which integrates psychological, social and micro-economical models underlying the artificial intelligence of the engine this technology allows for interactive storytelling of the gamer and the emergence of unique game experiences. Referring to mobile game *design* interactive storytelling completely incorporates the gamer as producer and consumer. But thinking about mobile *gaming* the basic idea of interactive storytelling is not fitting as well. The meeting at the fire comes before and after hunting. Interactive storytelling is the activity before and after the movement of the gamer respectively as in our concept parallel to the movement of the gamer.

While the interactive storytelling approach offers a view on gaming and on the human-computer-interaction, which has consequences for the development of ideas, concepts and games, the other candidate the *'game-design-pattern-language'* offers a view on patterns, on design solutions working within particular circumstances. Game design is not only the work of one singular designer. Over the past decades game production has become an industry like film production. A growing knowledge body of game design has evolved from without the

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[4] The name derives from Desiderius Erasmus (1466-1536), author of 'The Praise of Folly' (1509).

development of computer games, the study of classical games, of psychological game theories and of mathematical game theory. Game design as a discipline and as a profession requires a means to communicate, plan, organize and document the work. The challenge lies in developing those means and techniques for communicating the engineering or craft knowledge that experienced designers have accumulated. This kind of knowledge is not an abstract knowledge, which is entirely separated from its origin and formalized. This kind of knowledge is based on experiences. The separation of this knowledge from the context might destroy the knowledge. The experience of the designer has to be preserved and can be preserved in a pattern and in its relation to other patterns. A similar challenge as in game design today emerged within architectural design in the sixties. Architectural design also has been practiced as an art. To manage the design of complex large buildings architects applied formal methods to conceptualize and organize their work. They failed at least in regard to the quality. The result had been buildings, which didn't fulfil the needs of the people who lived and worked in those buildings and didn't adapt to the local social and physical environments. The architect Christopher Alexander and colleagues (Alexander 1979, Alexander et al 1977) compared those modern buildings with the 'living' buildings created in other societies at other times. The latter ones 'embodied 'the quality without a name', a recognisable but indefinable quality which floats in the semantic space bordered by terms such as 'alive', 'whole', 'comfortable', 'free', 'exact', 'egoless' and 'eternal'. Patterns are conceptual tools for helping people design buildings which might themselves have that quality.' (Pemberton 2000) Analogue efforts are made today within game design especially by the game design patterns project (Björk, Lundgren and Holopainen), a collaboration between Nokia Research Centre and the PLAY studio at the Interactive Institute in Stockholm, Sweden (http://www.gamedesignpatterns.org), but also by others (e.g. Kreimeier 2002). A dangerous misunderstanding of the game-design-patterns-language is the use of patterns as building blocks in all phases of the development of a game you only have to put together like Lego. In the first phase of developing the concept for example, you won't succeed, if you connect patterns. You first need a game-idea. Of course you also need an idea for connecting Lego blocks. You might get your idea by going over patterns but this is not the same as putting them together. You also might get your idea under the shower or at breakfast. And before you can work with patterns as building blocks you have to make your idea explicit. The idea has to function as an elementary *game*, as a play mechanic and finally as *a scheme of development*, which allows to plan and organize further work. This process of getting an idea and getting it started is embedded in the specific context of the designer. There are contextual premises of your work given by external requirements, qualifications, personal ambitions, group dynamics, organization, funding, which strongly influence your way of thinking and shaping the game. In this first phase you have to focus on a clear expression of your idea. The going over patterns is like reading of books or studying games only one condition to work as a designer. There will be a time you have to completely abandon patterns to get your design done. What we need is a language, which allows the designer to express, to organize, to reflect on the own design activity. We need a language, by

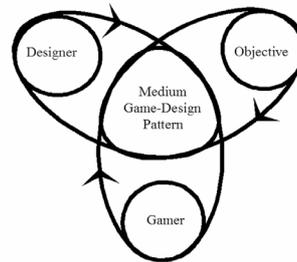which we talk about the *use* of patterns, the creating and applying, that is the *designer's activity*.

Figure 1: Game Design Activity

Patterns are necessary elements for game development, but not the whole language we need. The Swedish game design patterns project group is aware of that danger. They are not only collecting, analyzing and redefining game design patterns, but also looking for the *use* of game design patterns during the different phases of development - the development of the concept, problem-solving and analysis and comparison of games - and this is in our view decisive. 'We describe three different use areas for design patterns for games: allowing different games and game genres to be *compared* to each other through analysis and comparisons of games in terms of components and interaction; the *development* of game concepts from an idea to a draft through the selection of patterns and recursively selecting subpatterns based on their feasibility for the particular design context; *problem-solving* during development by finding related patterns and adapting previous design choices to the current problem.' (http://www.gamedesignpatterns.org/). And especially for the situation of development they specify 'Having a collection of patterns is in essence having a listing of concepts that other game designers have found useful for designing games. Having these concepts at one's fingertips provides a game designer with a knowledge base that can be used to find the core of a new game design or tweaks that make a game different. One begins by selecting a few patterns based on the core game concept (and external requirements). These patterns are analyzed in the specific context for the designers' (http://www.gamedesignpatterns.org/). Game-design-patterns are useful as a language only within a deep understanding of the game-designer's activity. A concept of the game design activity has to encompass, the designer, the conditions, means and media of the design process, the relation to gamers and to gaming as well as the relation to others as there are partners, customers, directors, the dimensions and phases of the work process and so on. A very elementary figure of the design activity outlines essential instances of design: the designer, the conditions, means and media of his work, including the game-design-patterns, the objective of his work, the gamer as the imaginary and or real partner, he has to refer to (Figure 1). Asking now for mobile gaming in the next step one has to start with asking for gaming. But if you try that, you are overwhelmed by the different approaches. There might be as much definitions of play as there are researchers, who studied playing.

Playing

There are theories, that emerged in the second half of the 19th century and explained play with reference to functions playing has within biological, evolutionary or social processes (e. g. Spencer 1855, Hall 1906, Groos 1901, 1922) or defined it on the contrary as a 'just for fun' or an 'as-if' activity (Lazarus 1883). In the 20th century theories emerged, that tried to integrate different aspects of gaming within one theory, some started from the phenomena of gaming (e. g. Scheuerl 1994, Chateau 1946, Buytendijk 1933), some focused on the interaction between individuals and their surroundings and on the interplay between form and content of cognitive actions (e.g. Piaget 1968/1972, Mead 1934), some understood play as an essential element of culture (Huizinga 1938). Only very roughly you might group the theories into two basic traditions, the biological-functional tradition and the anthropological-cultural tradition. The former ones are going back to the Enlightenment, the latter ones to the romantic and the classic period. In the latter tradition we see for example Fröbel (1782-1852). According to him a play is both a means of expressing oneself and a means of understanding the world (Fröbel 1838). There is also the aesthetic concept of playing from Schiller, akin to media theories of today: play makes the human being complete, play enables the human to enfold the own double nature by creating a 'living form' (Schiller 1795, 333). The play is here an instrument of creating and acquiring (aesthetic) orientations, which characterize the special way of one's living (see also Sachs-Hombach 1995). This difference between the theories of playing resembles that difference Snow has made between the two worlds of science, the world of nature and the world of culture. In the following approach we use and combine both traditions.

In our view playing is a slight moment of each human activity, which may enfold within a burst of energy, transcend the pre-given limitations and become an 'living form' of its own or may stay inconspicuous and die with the activity. Play is akin to the moment of creating and using results of cognition and action, and akin to the pleasure of consumption. Play is that moment, which emerges by the interaction of the double characters of each activity, the form and the content, the rational and the emotional, the instrumental and the social dimension of human activity. This definition is easily to integrate into the preceding figure 1. The designer might be instantiated as a gamer, who relates to other gamers.

Mobile Gaming

While the gamer within computer-games is separated from the surrounding, the mobile gamer is in a certain way re-integrated into the surrounding. The gamer is playing and as such still different from those, which don't play, but within mobile gaming the player moves within the same world and behaves within the same world as the non-player. But is it this, what makes the difference between computer-gaming and mobile gaming? Our hosts proposed a typology of games,

which allow us to describe differences. The model they use has 13 dimensions, grouped under the headings of Space, Time, Player-structure, Control, and Rules. The crucial difference of mobile gaming they describe is the *physical space*. Mobile games 'take place in physical space, and this is what makes them unique compared to other computer games.' (Aarseth, 2003). This difference has more implications. The territory is decisive. In the context of 'Gangs of ZIMT' we have a mainly closed playground in the homogenous building with defined borders (walls). Gamers playing in the real world can expect that when leaving the building they will lose contact to their team mates in the virtual world. When playing in an open environment like the city of Bremen there are no natural borders, which separate the playground from the rest of the world. The playground in the ZIMT is clean and manageable compared to the playground city of Bremen, where outer factors are merged with game conditions and might influence the game. Further dimensions change. For instance the mobility of the gamer at the ZIMT is well defined, moving by feet or by elevator. Bremen offers a greater variety – the gamer might move by foot, bike, car, tram and so on. This in turn has consequences for the time-management in the game. Finally the relationship of privacy and public, the gamer within Bremen is far more exposed to the curiosity of strangers. The *nature of the game activity* is changing. Within computer-games the physical activity is reduced to sitting in front of the computer. The main activity is the movement of the gamer in the virtual world. The nature of the movement of the gamer is above all imaginary. Contrary to the computer gamer the mobile gamer moves physically. The gamer is running, chasing, escaping, is hiding and not only his avatar. He is sweating, becoming breathless and jumping full of joy in the case of success. The imaginary activity is bound to the physical movement and supported by the physical environment. According to the psychological concept of activity above. The physical level of activity is more elementary than the imaginary one. Game design should be aware of the different activity levels and the possibilities to address them and their relationship by concepts (see also Bruns, http://www.artec.uni-bremen.de/people/W_Bruns/). The physical activity changes also the *relationship of the gamer to the computer*. The computer becomes integrated into the activity and the surrounding of the user as Mark Weiser has envisioned with the concepts ubiquitous computing and calm technology (http://www.ubiq.com/hypertext/weiser/UbiHome.html). Mark Weiser has outlined the fundamental change of the design: 'For thirty years most interface design, and most computer design, has been headed down the path of the 'dramatic' machine. Its highest ideal is to make a computer so exciting, so wonderful, so interesting, that we never want to be without it. A less-travelled path I call the 'invisible'; its highest ideal is to make a computer so imbedded, so fitting, so natural, that we use it without even thinking about it. (I have also called this notion 'Ubiquitous Computing', and have placed its origins in post-modernism.) I believe that in the next twenty years the second path will come to dominate. But this will not be easy; very little of our current systems infrastructure will survive.' Within mobile gaming the devices has to support the

physical activity. The methodologically next step we wanted to do: to exclude all elements, which are not necessary within the elementary mobile game concept and develop a concept, which has to be immediately realizable, instantiates the gamer as producer and consumer and shifts the territory from the ZIMT to Bremen.

'Gangs of Bremen' – concept for the next phase

The elementary play-mechanic

The game-play is now as follows: The *objective* of the game is to conquer the symbol of power, the Key of Bremen. The gamers are organized in gangs. They carve out their territories, defend them and attack the territories of the other. The power of one gang is anchored in the own territory. The Key of Bremen is conquered by that singular gang, which captured the most landmarks within a pre-given time. The *gamers* are organized in gangs. Each gangs is a group of several students, each group is related to one of four 'down-town' high schools in Bremen. Between the four in reality there is a non-violent conflict about whose school is to be the best and most difficult one. This conflict can easily be 'patronized' for the game. The *playground* is a combination of the real world and a 2D-map of the real world. The *physical space* is the city of Bremen, where all schools are placed around. The *gang's territory* is marked out by the gamer themselves setting landmarks around their school. Around each of the landmark a circular territorial area is defined. The whole gang-territory is the sum of those landmark-areas. The *virtual space* is a 2D-map of Bremen. On the map the different gang-bases (schools) are marked as well as the territories by the landmarks that belong to the school of the gamer. The *time*-sequence of the game is as follows: *first*, the gang marks out the territory by setting landmarks; *second*, the gangs compete in defending the own territory and attacking the other territories; *third*, that gang succeeds in the conquest of the Key of Bremen, that has succeeded in the conquest of the most landmarks within a certain time. The durance of each round will be defined accordant to the experiences. The devices are handhelds. Gamers will be supported by PDAs during their hunt for hostile territories. The PDAs are equipped with a GPS and a GPRS module. The GPS module determines the position of the gamer and the GPRS module ensures the connection and communication with the central game server. The game server knows (with an inaccuracy of max. 5 minutes – this is the time interval in which the position of a player is updated to the game server) the GPS coordinates of each gamer and provides the gamer with this information after certain time intervals. The game server knows the territorial owners of the landmarks as well as other facts relevant for the game. In order to minimize the standing charges during the game, lots of information is stored on the players' PDAs and not on the game server. Alternatively to playing the game with PDA support, a version should be planned which is playable on mobile phones with GPRS and GPS (or other positioning

technique) support. The game-mechanisms are based on the combination of the real and the virtual world. While in the former concept the combination of both worlds is based upon the division of labour between members of the gang, assigned either to the virtual or to the real world, in the current concept the virtual world mediates the game-activities in the real world. The mechanisms are collaboration, orientation, conquering hostile territory and attacking enemies. Collaboration between gang members is required to master the marking out of territories. The marking out of the territory of the gang - has to be done by the gang-members by moving to certain places, take a photo of that place, note the coordinates (longitude and latitude) and give the message to the server. For each landmark, a photo and the corresponding GPS coordinates of the landmark are stored. When taking photos, certain guidelines must be observed, for instance objects must have a minimum height of 1m and have to be photographed from a distance of at least 3m. There should also be restrictions about what kind of items is allowed (and not allowed) for the photos. Allowed items could be houses, fences (as long as they are unique enough to be identified), streets and so on. Items are not allowed are that which cannot be publicly accessed as well as items that are available only temporarily (such as parking cars). These restrictions avoid that photographed objects cannot be identified by the other gangs at all. *Orientation*: to have an overview the gamer has a 2D map on their PDAs, which shows an extract of the city quarters in which the game is played. On the map the different bases (schools) are marked as well as the territory and the landmarks that belong to the gang of the gamer. Territories of the other gangs are not visible (this would be a too big help for others when conquering hostile territory), but each gamer gets to know how many landmarks there are left of the other territories. In defined intervals (5 minutes for example) the positions of all (friendly and hostile) gamers will be updated in the map. *Conquering hostile territory:* To attack hostile territory gamers have to identify a landmark by the photo and go to the place they think they have discovered. When the player has arrived at the place he acknowledges this on his PDA. The PDA checks the position of the player with the position saved with the photo and in case of correspondence the area around the checkpoints now belongs to the gang of the attacking gamer. *Attacking enemies*: There is not only the possibility of attacking hostile territory but also attacking opponent gamers. This can be done on neutral or the territory of the attacker. There is no possibility of attacking a gamer on his territory. A successful attack disables the losing player as long as he has not been back to his base to reactivate himself. To attack a player one has to get near to an opponent. The PDA will show that there is an opponent in range. *Gamer as producer*: During the first phase for the game all participating gangs have to define their territory with photos of the places the landmarks are set. This creates a large amount of landmarks all over the city. In a later phase of the game it could be considered that not only schools can compete with each other but the game could played by tourists or other interested groups who do not have the time to define a territory

for themselves in a first phase of the game. They will be assigned a territory, which consists of 'old' landmarks, which have been defined in earlier games.

Conclusion

The reduction and condensation of the concept to an elementary play-mechanic now enables a game that is immediately realizable, instantiates the gamer as producer and consumer and allows the move from the ZIMT to the city of Bremen. The game is immediately realizable within the next phase of development. It has become an easy concept in so far the virtual world is reduced to a 2D map. The concept is realizable on the elementary level and can be enhanced by higher levels, growing more complex relations between virtual and real world. The elementary mechanic therefore enables accordant sequences of the development. The step of simplification of the concept has been done carefully. We have hold and combined all those elements of the elementary level, which allow for a smooth transition from the elementary to higher levels of mobile gaming in further phases. This elementary concept is as such mainly independent of the city it is played in. In this version it is adaptable to other cities. Prerequisite is the existence of an infrastructure that is suitable for the game. The *situating* of the game will be realized by the gamers themselves (as well as by the designers within further development). The gamer acts as a producer in the following phase in that the gamer participates in developing the content by taking photos. The move to the territory of the city Bremen can be done.

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