

Pervasive Play, Immersion and Story: designing *Interference*

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ABSTRACT

Pervasive games are games that are played in the real world – they are not played as a computerized simulation or on a limited physical game arena. The central attraction for pervasive games is that they offer the pleasure of doing things for real. The world is a vast and infinitely changing resource of content for pervasive games.

Interference is a pervasive game playable by groups of 6-8 players lasting for a total of 3-4 hours and using both technology (such as GPS positioning and augmented reality) and human actors to create the full experience. In this paper, we describe the design goals for *Interference* and how these permeate through all aspects of the design of the game to create a coherent experience. *Interference* shows how an emotionally complex game experience can be achieved without resorting to ambiguity or deep role playing. The game has so far been staged on seven occasions and we briefly report on the experiences from those stagings.

Categories and Subject Descriptors

J.5 [Computer Applications - Arts and Humanities]: *Performing arts*

General Terms

Performance, Design, Experimentation.

Keywords

Pervasive game, role play, game design, augmented reality, GPS, ubiquitous technology, game mastering, game aesthetics, pervasive storytelling

1. INTRODUCTION

Pervasive games offer experiences that are unique to the genre, and consequently their design considerations are different from both those of traditional computer games, and similar non-pervasive game genres such as table-top role playing. However, to research these it does not suffice to develop small experimental games. While most games developed in research projects can be

classified as experiments and prototypes, a complete game design relies on balancing aesthetics, story line, game mechanics and technology design into a coherent whole. In this article we aim to dig deeper into the design qualities of pervasive games through the detailed analysis of a particular game design; the game *Interference*.

Interference is an adventure game played by a group of six to eight players in the real world. The game plays out in two distinct phases. Players begin the game by taking on the role of technicians tasked with repairing the failing Internet in an area. But while doing so, they discover that the real reasons to the failure are not just technical, but have their roots in a bizarre family conflict with dark undertones. Eventually, they are faced with a difficult choice with no easy answer and dramatic consequences. Lasting for a total of 3-4 hours *Interference* encompasses both gamistic play and elements of live role playing [2], as the players meet with three actors acting out central characters of the storyline.

2. PERVASIVE GAMES

Interference is best described as a *Pervasive Game*. This term does not have one consistent definition throughout literature [14] and we adhere to the tradition that defines pervasive games as a design concept. Markus Montola [11] defines pervasive games to be games that extend outside a predefined playground, invade people's lives through being playable over varying time periods and in various circumstances, and that are played among – and sometimes with – people that are not aware of the game.

We take a slightly simpler view of what constitutes a pervasive game. The salient feature is that they are *played in the real world* – they are not played as a computerized simulation or on a limited physical game arena. In this, the real world should not be interpreted as the same as the *physical* world. Today, the 'real' world include many digital arenas; games that use SMS, mobile phone calls, web sites, chats and blogs are still played in the real world. The central attraction for pervasive games is that they offer the pleasure of *doing things for real* [12]. According to many designers and case studies [10, 17, 18] one of the strongest appeals of pervasive games is that the ordinary environment is given new meanings. Everything can be interpreted as ludic, not just the designed game content. The world is a vast and infinitely changing resource of content for pervasive games.

Sometimes this is also taken to mean that pervasive games must blur - or even eradicate - the boundary between game and non-game activity. The game can turn up at any street corner, any person you meet might be a game participant or actor, and every phone call can be a game message that requires immediate

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attention. This is the explicit design ideal for Alternate Reality Games [10, 18]; games that are hidden in the real world. Through inviting players through a ‘rabbit hole’ [10], they peel off a layer of common sense reality to reveal the fictional game world as a hidden ‘truth’ below. This is however a problematic design ideal. Even within the ARG aesthetics the game must still be experienced as a game, or the experience becomes just one of mundane life. The game must also be demarked as playful activity for gamers and by-standers alike, as non-players that observe game activities otherwise might be confused or scared by the unclear state of the events [13]. From a thematic perspective, the Alternate Reality design ideal seems to seriously limit the choice of thematic for Alternate Reality Games which often deal with hidden organizations, forgotten secrets, and conspiracies.

3. ACTIVITY-ORIENTED GAME DESIGN

It remains to explain why we consider *Interference* to be a *game*. It could very well be argued that it is not a game but rather a pervasive interactive story. Just as pervasive games do not have one definition that is universally agreed upon, there is not one single definition of what constitutes a game. The Salen and Zimmerman [16] definition is perhaps the one that comes closest to being generally adopted:

“Game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.”

This definition differs vastly from the common sense understanding of a computer game; a computer game is a piece of software which implements a simulation [1] offering a host of activities to its users. Most authors will agree that a computer game must contain some artificial conflict to be considered a game; but computer games offer many other experiences as well.

For the authors of this article, the design ideal lies fairly close to that of a computer game (we will discuss later in what respects it differs). We are seeking to develop a game that offers immersion and story as well as artificial conflict, and for this reason we need a definition of games and a game analysis framework that is able to encompass other aspects as well.

3.1 The Threefold Model of Role Play

To address this, we turn to the analysis of an existing game genre that has similar properties; the genre of table-top role playing games. A very useful and comprehensive structural analysis of the genre has been done by the player community itself; the threefold model for RPG which originally was developed on the newsgroup `rec.games.frp.advocacy` and subsequently written down in FAQ form by John H. Kim [5]. The threefold model groups many aspects of group contracts into logical categories. A group contract includes every facet of how the game is played: not just the mechanical rules, but also how scenarios are constructed and what sort of behaviour is expected of player characters.

The threefold model suggests three different categories of table-top role-playing games: dramatist, gamist and simulationist games, depending on what they value in the game. Dramatic games value how well the in-game action creates a satisfying storyline. Gamist games focus on setting up a fair challenge for the players such as combat situations or puzzles to solve. Finally, simulationist games focus on creating an as thorough simulation

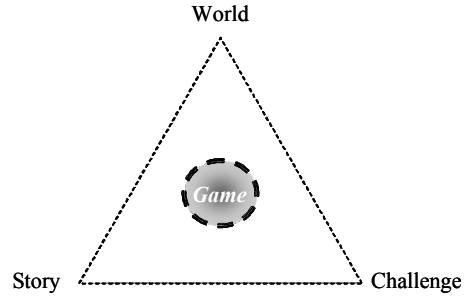


Figure 1. The original three-fold model.

of the game world as possible; in-game events are handled based solely on game-world considerations. The characterizations overlap; most tabletop games include aspects of drama, gamism, and simulation in the same game. The original model is intended to analyse aspect is prioritized (typically by the game master) when there is a conflict between these as design goals. A useful way to depict the model is as a triangle¹, where each individual game can be placed based on how it weighs the three aspects against each other. Lindley [8] has re-used this framework as a generic taxonomy for computer game analysis.

The three-fold model thus characterizes not the game as an artefact (as we think of computer games) or just by its rules and outcome (as Salen and Zimmerman do), but as a complex social contract much in line with Huizinga [4] and Callois [3]. This suits pervasive games well, as they strive for rich experiences. Pervasive games cannot be described in terms of an implementation alone, and using the threefold model we are able to discuss a complex social contract rather than a set of rules.

3.2 Designing Activity

The social contract of a game frames the player *gaming activity*. It determines what the players can and cannot do within the game, and it enables players to frame the game activity so that it can be distinguished from non-game activity. Role players will often distinguish between ‘in-game’ and ‘off-game’ discussions.

The original three-fold model was developed by game-masters to describe their preferred game-mastering style, which makes it natural to interpret the three corners of the triangle as *inviting player activity*. A pure ‘gamist’ game would invite activities such as questing, puzzle-solving, and competing. A ‘simulationist’ game would primarily invite role-play; through immersing in the game world and the own character the player contributes to the construction of the diegetic world. A ‘dramatist’ game will on the other hand require the players to be aware of and adapt to the story line. To some extent, the dramatist game requires that the players take a more passive stance and choose to *listen*. An active form of listening is exploration, and as the live role-play community is well aware of [2], it is also possible to role-play in a dramatic manner to actively contribute to the story. The latter is perhaps best described as acting rather than role-playing.

¹ Irina Remmpt, entry no 45,

http://groups.google.com/group/rec.games.frp.advocacy/browse_frm/thread/22dcbc18b745b368?dq=&hl=en&lr=&ie=UTF-8&oe=UTF-8&safe=off&num=1

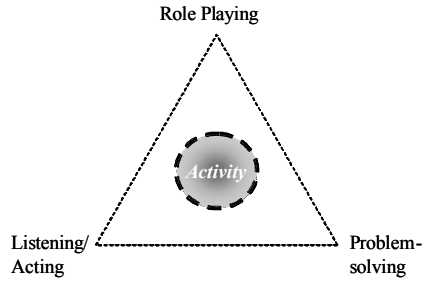


Figure 2. An activity-centric version of the threefold model.

Pervasive games as similar to role-playing games in that they often strive to balance between these gaming experiences. Players will need to switch between these modes of game play. A game design that aims to balance the three experience types must provide cues or invitations that enable players to understand which type of activity they are invited to. Not only must the game invite the players to the intended overall contract, but it must also provide sufficient cues to allow the players to understand when they are expected to take one or the other interpretational stance towards the game contract.

If we compare role-playing games and computer games, the latter tend to strive for a balance primarily between game and story whereas role-play games also strive to include simulationist role-play. Role-playing games often use less advanced game-play and put lesser emphasis on e.g. game balancing and reward structures. The same is true also for many pervasive games (see e.g. [17]) including most live role-playing games, and it certainly holds for *Interference*.

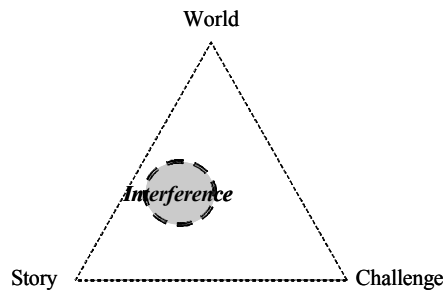


Figure 3. The design balance for *Interference*

4. DESIGN GOALS

The primary goal for *Interference* was that the game would *change* nature during its course. The game would start out in a rather gamist manner, but would later change into a story-driven game. Through bringing the background story and characters into focus, the players would be encouraged to immerse in the game world, taking them forwards to an ending that strongly encourages them to role-play. This structure was chosen both because we believed that it would create an interesting experience, but also because we intended *Interference* to be a demonstration game that would allow participants with no previous experience of pervasive games to experience a wide range of game modes. This requirement posed a particular challenge: we wanted to *change* the social contract with the players during the course of the game.

We were also careful to design *Interference* as an unambiguous game experience. *Interference* is *not* an ARG; our goal was to allow players to feel that they were ‘playing for real’

and at the same time never doubt the borders of the game. An example of this design goal was that we required the actors to wear masks. By wearing masks, the actors become easily identifiable in public. Another design decision that emanated from this goal was that the player’s manipulations of the game content should feel ‘real’ but yet be symbolic rather than indexical [9]. This was done through introducing a ‘virtual’ content layer that the players could investigate and manipulate in ways that required real world action. In particular, the players were asked to trace an implied magic network and map it on a real map, using tools such as rulers and a compass. Also, to symbolically close (hidden and virtual) gates they had to play a real melody on a bone flute to a technology enhanced doll.

Finally, we wanted *Interference* to be partially automatic and partially game-mastered. Pervasive games often benefit greatly from game-mastering [6]. The game masters would use both technology traces and human spies to keep informed about what the players were doing, and they would communicate with the players both through technology output and through instructing the actors on when to contact the players and what to say to them. Since *Interference* also contains a game engine it was crucial that the game masters could also control the game state of this engine. This combination of automatic and manually controlled gameplay poses high requirements on an integrated game mastering system.

4.1 Design Process

Interference was collectively designed by the authors of this article. The production was done in a much larger team through several iterations. The process needed to be iterative to achieve a balance between the different design elements; the gameplay experience, the story arch, the technology functions and limitations, and the real-world setting of the game including its location, the actors, and props. However, the game was not presented for user feedback until fairly late in the design process, as it would be difficult for a player to conceptualize the game experience unless it already was fairly complete. The game was tested with a group of invited players in the last iteration of development. This was important in order to balance the game and led to several minor changes to the game design.

5. STORY AND GAME PROGRESSION

The players enter the game as technical engineers recruited to *Danske Data*. The company has created its success from providing fast, reliable and secure Internet services. Now, these services have broken down in the area where the game is staged, and the players are tasked with finding out what has happened, and fix the problem as soon as possible. The situation is extremely critical for the company as their reliability has been the main source of their success and the causes of the current breakdown are completely mysterious. Throughout the game, the players meet and interact with three central characters.

- **Kung Danske.** Kung is the CEO of a highly successful multinational company. He was severely injured in a car crash about one year ago which has left him physically and mentally broken. He is a benevolent but emotionally inadequate character, charming but patronising to those close to him.
- **Matilda** is the daughter of Kung. Her mother is a leftist activist and journalist from the middle-east. Matilda takes over care of her baby brother as her mother is imprisoned.



Figure 4. Players mapping out their location on a map. Picture from the Kista stagings of *Interference*.

Matilda has built a magic *doll* and used it to connect the Internet to an ancient magical network, causing interference 'gates' where they intersect and disrupting the data network. Constructing the doll has caused Matilda's baby brother to become seriously ill. Matilda represents chaos and freedom.

- **Catrina** is the current wife of Kung and represents control and stability. Unknown to the players, she also was the person who staged Kung's accident in order to extract a rib from his body. This rib has been made into a magic flute which the baby boy, when grown, will wield to its full powers in controlling both the ancient magic and the modern data networks.

Interference is played out in seven separate scenes that progress in linear order. Although the game can be adapted by the players in several ways, the storyline is fixed to create a dramatic arch [7].

Scene 1: Getting briefed. The first thing that happens in the game is that the players meet a technician who hands them the Magic Lens device and the four communication phones. He or she provides an in-game explanation of the first task (map out the network and identify the source of the interference) and instructs the players in the use of the technology and the map. The players then get to meet Kung and Catrina who introduce the storyline.

Scene 2: Scouting the Network. During the first phase, the players primarily use a Magic Lens device to scout out the network which according to the game storyline is not working properly. During this phase, players will sometimes get phone calls from Kung who queries them a bit on their progress, can tip them off on potential places to check out, and in general is friendly and encourages them. Towards the end of the phase, they also get a phone call from Catrina who informs them that the network breakdown was sabotage and that it was caused by Matilda, Kung's daughter.

Scene 3: Meeting with Matilda. When the players meet Matilda she is confused and upset. They have to calm her to get any information out of her. Eventually, she will give them the doll and her own phone, telling them that it might help them in their quest. She will also hand them a map of the network that she has stolen from Kung.

Scene 4. Seeking Matilda's memories. The players use the doll and the phones to seek Matilda's memories in the physical landscape. These come through as video clips at the interference gates that have been created through Matilda's fiddling with magic. (They can also continue to use the AR devices at glyphs, as this will help them understand the relationship between the

gates and the memories.) The players still receive phone calls from Kung, who is still encouraging them. They can choose to tell or not tell him about Matilda and the doll. However, they also get calls from Catrina who told them about Matilda. During this phase, the game master also keeps increasing the health status of the Doll to signify that the baby is getting worse all the time.

Scene 5: Meeting Catrina. When Catrina finds out that the players have got a doll, she gets upset – Matilda has been meddling in something she cannot control. She tells them to come and meet them. She hands them the flute and tells them to play it to the doll at the gates.

Scene 6: Closing the gates. Catrina instructs the players to close the gates by playing the flute to them. They are also given the 'magic melody' which will close the gates. While the players are closing the gates, the baby's health status improves (which is visible on the doll), but at the same time Kung gets worse. He calls them to congratulate them on their success in fixing the network, but the players can hear that he gets more and more ill with each call.

Scene 7: Finale. There is a price to pay for fiddling with magic: a death. Towards the end of the game, Catrina informs the players of the location of the final gate. This gate is located in a high-tech skyscraper where the players meet Matilda and Catrina who urge them to make one choice. Matilda asks the players to leave the final gate open, saving her father and leaving chaos in the world – even if this will leave the baby damaged or even dying. Catrina urges them to close the final gate, restoring order and saving the baby for its future powers. By handing the flute over to Catrina or Matilda, the players decide the fate of the Internet, of Kung, and of the Baby.

"My father is close to death, I know what I have done but he doesn't deserve this. Leave the last gate open. I'm scared, I know I have unlocked something that can't be controlled properly but the world is too ordered, a little chaos can't be so bad. Do you really want our lives to be controlled by the likes of her (points to Catrina). I feel so sorry for my brother, he's only a baby but he has some terrible power. Someone with his powers will never lead a free life... give me the doll and flute so I can lock this last gate open for good. I made this happen, it is for me to put things right..."

(Actor script for Matilda, final scene)

6. THE ROLE OF NARRATIVE

The story line of *Interference* is based on well defined archetypal characters, a rich and complex back story and a simple but dramatic tragedy. The intention is to offer opportunities for immersion into the game world and engagement in the storyline to the players. It uses two themes in parallel: a personal conflict in a complex family, and a political conflict regarding the future of the information society. This is given further depth by secondary themes: the role of second generation immigrants in western culture; racial tension and integration in western culture and the balance between anarchy and order.

An important realization during the development was that the entire background story need not come across through the game. It is necessary to enable the actors and the game managers to enact a consistent game world, but the players can choose to uncover as much, or as little, as they wish.

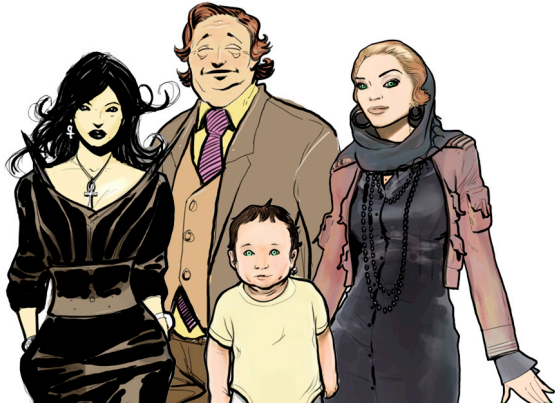


Figure 5. As part of the character creation process, all game characters were drawn by a professional artist.

The story ends dramatically: one character dies as a direct and emotional consequence of player action. This choice to develop the narrative as a tragedy was intentionally used as a means of questioning and inverting the typical role of death in video-gaming: multiple deaths and no consequences. In *Interference* there is only one death; but it is one that matters to the players.

6.1 Game Character Development

The development of the game characters was central to shaping the *Interference* experience. As the game world is that of our own everyday world, the game characters are the central resource in creating the story universe. The game characters in *Interference* shared similarities with both role-playing characters and computer game characters. As they needed to be understood quickly by players, they needed to be developed as *interesting stereotypes*. This is similar to what is done in computer games; characters need to be slightly stereotypical to enable the players to immediately interact with them in a way that is consistent with the game structure. But at the same time characters needed to be understood and acted out by the actors. These needed to understand and relate to their characters in a deeper way. To enable this, each of the acted characters was given a full back story, character profile, and a drawing depicting the character in a way similar to what is done in role-playing games. The authors also wrote scripts for the key interactions with the players. These were not intended to be followed to the letter (as conversations needed to be improvised on player responses); they served to set the language and tone of the characters and helped the actors to understand them deeper.

The central characters cannot be easily classified as good or bad. These 'interesting stereotypes' remain recognizable even familiar to the players, easy to identify with and relate to. The players should be able to sympathize or conflict with all the characters either because of their personality or their world view. Gender roles for the characters were devised so that the typical normative game character roles, with shallow female characters and more complex male characters, were reversed. This form of gender acknowledgement is seen as critical in exemplifying representative character roles rather than merely reinforcing existing gender bias. In the game there are two male and two female characters: the male characters are designed to be more simplistic, easier to read and identified with in a superficial manner. The female characters are more complex requiring the players to interact or react with them on a more emotional level.

In the final scene, the controversy plays out between the two female characters.

7. PLAY STYLE AND AESTHETICS

Although *Interference* is designed to invite different modes of play in different phases, it leaves the contract with the players fairly open and allows them to select their own play style. The game is relatively short compared to live role playing games and emphasizes adaptability to player choices over complexity. (Remember that the game is designed to be playable by people with little previous experience of pervasive games.)

In particular, *Interference* is *not* a live role-playing game unless the players choose to play it in that way. Players are not provided with individual characters (with names and background stories) as is normally done in table-top and live role playing alike. Still, the players are introduced to the game in a way that invites shallow role playing; they are described as 'telecoms engineers' and they are asked to dress up in blue overalls. In addition, each player is given a functional role which is defined by which equipment they carry. For example, one person who will carry the Magic Lens device described below is given the title of 'scanner'. Another person carries a map and is given the title 'tracker', and so on. This allows the player groups to negotiate their own level of role-taking and engagement. If they wish, they can develop their characters further, or choose to stay in character for the full duration of the game.

After the brief introduction to their shallow roles, the game structure and subsequent revelations of the background story will encourage the players to engage more and more in the game world and story. In providing players with strong metaphors, clearly defined game mechanics and a consistent aesthetic, game complexity and immersion are progressively incremented. By increasing complexity whilst offering differing levels of game and actor interaction, the players are able to choose how much they immerse in the story line and role play. This culminates in an emotional and dramatic finale where players are strongly encouraged to role-play a decision together.

Since the game is played out in public space, it has a strong performative aspect [15]. The players are dressed up in overalls and carry some distinctly incongruous equipment (including a 50 cm long red doll), and will appear to non-players as doing something out of the ordinary. The public performative aspects introduce social tension into the game, intended to make players both more engaged as well as slightly uncertain. Walking around in the (high-tech) city mall carrying a large red doll with a blinking eye was meant to be slightly uncomfortable – perhaps in particular for the male participants. We decided that the players should not need to split up during the course of the game, but always play as a group, to encourage them both to dare to perform strange things in public and increase their engagement in publicly visible activities. Most likely, spectators interpreted *Interference* as some kind of treasure hunt game.

7.1 Pervasive Aesthetics

Since a pervasive game is played out in the real world, it is not possible to design the aesthetics in every part. Still, it is possible to create a consistent aesthetic that provide a convincing level of



Figure 6. Player using the magic lens device. Photo from the Kista stagings.

connection and a sense of continuity as the game progresses through public spaces. In this game, the masks, the doll, the website (complete with music track), and the in-game sound and video were aesthetically designed to fit together. The overall game style was inspired by a contemporary dystopian computer game aesthetics (such as *Half Life 2*), with thematic influences drawing from Mexican folk lore and Voodoo. Culturally, we placed the game in between contemporary Middle Eastern and Scandinavian culture and fashion. One reason for this was the game's original location in Kista; a suburb outside Stockholm which is clearly divided into a high-tech industrial sector and a living sector which is dominated by an immigrant population. The aesthetics also changed slightly during the game to support the players' neutral but expandable relationship to their initial role whilst later on stimulating the emotional and sensory depth of the game.

The technology was used both to reinforce the game aesthetic and enhance the emotive aspects of the game. Whilst the initial technology was functional, i.e. tracking devices, torches, mobile phone, the use of technology in the later part of the game was more abstract and took form of a 'Voodoo doll' showing the babies' health and relaying video memories playing back Matilda's dreams. The videos and clips that were streamed in-game were portraying subjective dreams or memories of one of the central characters, emphasizing their emotional nature. The 3D models shown by the magic lens device were designed using glows and flowing special effects rather than distinct models. This helped to reinforce the feeling of hidden layers and phenomena, and prepares players for the metaphors and narrative of the dramatic part of the game.

An important design decision was that the central game characters would be acted. In a game where drama is one of the main elements, actors are a critical resource. The actors were carefully prepared for their roles so that they had internalized their characters and could improvise them in direct interaction with the players.

8. TECHNOLOGY

Interference is a heavily technology-supported pervasive game, and technology, game-play and story were developed in close interaction with each other.

8.1 Devices and their Functions

The players use four different devices in the *Interference* game.



Figure 5. Playing the flute to the doll. Photo from the Kista stagings.

The *magic lens device* is a Sony Vaio UX 280P Micro PC (UMPC) running software that implements mobile augmented reality. The device has a camera on the back side. When this camera is directed towards a special-designed black and white pattern, the software is able to recognize the pattern as well as the distance and angle towards it, and project a 3D model to appear on the screen. This way, the device works as a 'magic lens' that is able to visualize hidden objects in the real world. The players can inspect the objects from several directions and angles by moving and tilting the UMPC. The UMPC is connected to the Internet through a built-in GPRS card.

Four *mobile phones* running a special client program which communicates with the game server. The mobile phones are used as display units for streamed sound and video and are connected to the Internet over 3G or GPRS. One of the players is equipped with a GPS unit; this is used to track the players' location. The GPS and the doll both connect to the phone client.

The *doll* is a special-built device for *Interference*. It is able to display some in-game information and contains both a GPS (to trace its location) and a special-built digital signal processing circuit which is able to recognize a set of tones and communicate them to the mobile phone client. This hardware consists of an embedded microcontroller and a Bluetooth chip.

Finally the players are equipped with a *bone flute*. It contains no technology at all, but the music circuit in the doll is hard-wired to recognize the notes from this precise bone flute.

8.2 Giving Technology a Role

Technology-supported games use technology within the game, but the whole game is not implemented. An important aspect of these games is that the technology becomes a prop in the game; each piece of technology becomes an in-game artefact that can be handed out, shared between players, hidden in the real world, or even trashed as part of the game.

In *Interference* we used the technology to shape the players' game activity. During the first phase of the game - which is intended to be engaging in a gamist manner - the players are equipped solely with the UPMC device. The sleek and technological design of the device fits their role as engineers. The interaction with the UMPC is rather technical and fits their game task which is to scout out the network.

When the players meet with Matilda, she hands them the doll and her "own" phone. At this time the players are *not* equipped with the flute, which means that technically the doll only serves as

a means to trace the players' location and show the health status for the baby. While carrying the doll around, the players receive hidden memories from Matilda's life. The activity is one of listening and exploration. The organic design of the doll is designed to fit the magical story theme and intended to shift the player's attitude away from technology as functional towards relating to it in an emotional way.

Finally, the players also receive the flute which enables them to start closing the memory gates. Together with the doll the players are now able to control the gates and close them, which bring the players back to a more active game style. Some of the effects from playing the flute are directly visible on the doll – each correctly played note lights another LED on the doll and when the baby gets better the doll also shows this. However, the result that Kung is turning more and more ill is conveyed through phone calls from Kung and Catrina, to a player who is not carrying the doll or playing the flute. This forces the group to act collectively, bringing them further into an immersive game play stance and eventually leading them towards the ending scene.

9. GAME MASTERING *INTERFERENCE*

Interference uses a combination of automatic and game mastered gameplay. The technical part of the game mastering is done through the Gamecreator system [19]. Through this system, the game masters are able to monitor the players' location and movement, check which memory traces they trigger, and monitor them playing the flute on a note-by-note basis. The game masters can also manually trigger sound and video files and 'correct' the result of player activity (e.g. close a gate even though the players played the wrong melody). The system is also used to manually control the health status of the baby displayed by the doll.

Most player-game master interaction was however done through the actors. The game masters would instruct the actors on what to say to the players, e.g. to direct them to an in-game location if they got lost. The actors were thus a critical resource not only in shaping the mood of the game and inviting to immersive role-play, but also for game mastering. They needed to be very carefully prepared to understand the game structure as well as get into their characters.

Finally, the game masters would employ at least one "runner". This was a person who would follow the players around in the real world and try to keep close enough to listen in on their conversations. The runners were instrumental in keeping a tap on the mood of the players, knowing if they were enthusiastic, confused or bored, and adapt the pace of the game to this. Since the game was prototypical, runners were also instructed in the use of the technology and could step in to fix technology issues if these would arise. (For example, in most sessions the runners had to step in to change the battery of the UMPC.)

Pacing turned out to be the central issue for the game masters. The pacing of the game was crucial for the player experience, and needed to be adapted to the player group. The first game phase was always very exciting to the players in the beginning, but would become boring if it continued for too long, especially if the players went off in the wrong direction. Some groups got very engaged in the second phase, scouting out memories. When this happened, the game masters let this phase go on for a longer period so that the group already had visited all memory gates and located the memory content before they were handed the flute. In such sessions, the game masters would require that only a few gates were closed before the ending scene was

played. In other sessions, this activity engaged the players less and consequently the group was handed the flute earlier so that they could scout out the memories and close the game at the same time.

10. PLAYING *INTERFERENCE*

Interference has so far been staged on seven different occasions in two cities and countries. In January 2008, it was staged four times in Kista, a suburb of Stockholm in Sweden. In February the same year it was staged three times in Düsseldorf in Germany. The second set of stagings was done in collaboration with a group of students from the Mediadesign Hochschule in Düsseldorf. In total, the game has been played by more than 50 participants.

Overall, *Interference* is received very positively by the players. The players get deeply engaged in the game from start and the second scene (scouting the network) is perceived as fun and engaging. The players' engagement in fourth scene (tracing the memories) varies between the groups and is very much affected by how well the technology is working at the time. Due to network issues, the video and audio files will sometimes take long to stream to the phones, and this will affect the game experience in this scene. As the game is played outdoors in the winter, this is also the period when people start to get cold, and the length of it must be adapted to the weather conditions. The story line was not always fully understood, but this was compensated by the player's engagement with the acted characters.

When asked to classify *Interference*, one of the players described it as a computer game in the real world. The technology was seen as adding considerably to the overall experience:

"You got a feeling that you were connected to something bigger. You could do the same with compass, but you wouldn't get the same feeling."

(Player comment, Kista stagings)

The switch from gamist play in the beginning, to story-driven and finally role play in the end got mixed receptions. It was particularly problematic for the pre-test group in Kista. After this pre-test we changed the game slightly, so that Catrina would call the players and instruct them to start looking for Matilda towards the end of scene 2. This way, the players got an advance warning that the game was changing from a pure gamist mode, reinforcing the storyline and became better prepared to meet and interact with a new character in the real world. The meeting with Matilda was perceived as highly engaging in later stagings:

"The best moment was when we met Matilda for the very first time. She was standing on a dark bridge in the dimly lit park and seemed to be watching us. I was not sure if she belonged to the game and it took us a while to build up the courage to talk to her."

(Player comment, from post-game interviews in Düsseldorf)

The player groups took rather different stances towards the game. Two of the player groups in the Kista stagings were dominated by players with extensive live role-playing experience. These groups developed an immersive game play style. They would develop their characters much further than the other groups, and preferred to stay in character during the entire game. Somewhat contradictory, these groups had some problems with engaging emotionally in the story line. The most likely reason for this is that the role players were accustomed to and prefer immersive role-play, but also require richer and more engaging roles to truly engage emotionally. By contrast, one of the player

groups in Kista and all groups in Düsseldorf played in a more gamist manner. They did not develop their own characters further and would frequently discuss out of character during the game. However, these groups became deeply engaged in the story primarily through meeting the actors, and were emotionally moved by the final scene. The final scene was perceived as an effective reward by all groups. The location was instrumental in this. The location of the final scene high up in a high-tech building, with a view of a dark and dramatic city all around, created a feeling that the final decision was important and serious, and enabled the players to engage emotionally and intellectually in the dark and difficult decision they had to make.

11. CONCLUSIONS

The *Interference* design relies on a careful balance of a multitude of design elements, ranging from aesthetic considerations, choice of location, storyline, gameplay design, and the design and use of technology in the game. When the players arrive to the game, they are invited to a rather gamist game. The game structure and subsequent revelations of the background story will then invite them to engage more and more in the game world and story. In providing players with strong metaphors, clearly defined game mechanics and a consistent aesthetic, game complexity and immersion are progressively incremented. The use of interesting real world locations and real-world actors contributed the most to this effect. At the same time, the *Interference* players always felt that they were part of a game – interference is engaging without being ambiguous about its gameness.

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