Bjørnetjeneste

Using the City as a Backdrop for Location-Based Interactive Narratives

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Bjørnetjeneste: Using the city as a backdrop for location-based interactive narratives

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Abstract

Imagine if the city could tell us stories. Let us for a minute move away from the concept of mobile guides presenting their users with fact upon fact related to their physical surrounding as they move through the city. Let us instead imagine that we could turn a city street into the stage on which a fictional story unfolds, using the city as a physical backdrop for its narrative. Interactive stories taking place in the urban places we live in and move through. What kind of user experience would such a concept offer an urban citizen engaging with their physical surroundings? What would it be like if the city around us was digitally augmented not only with facts about people, places, etc. but also with fiction? By taking an orthogonal view on the content of location-based services for use in the city, we propose a non-goal directed user experience that weaves fiction into the immediate physical surroundings of people as they move through the city. Exemplifying this view we describe a concept location-based story conveyed though an urban environment, Bjørnetjeneste, that was designed to create an experience that is immersive, thought provoking, emotionally engaging, fun, and frustrating - rather than providing functional utility.

1. Introduction

Reality is everywhere. It is right there in our face when we wake up in the morning, and it continues to sneak up on us throughout our day, in the car, in our offices, in the tearoom, and at the dinner table. In recent years it has even invaded our TVs; not only through eternal streams of live news from wherever, but also through endlessly boring reality TV shows documenting minute-by-minute details of peoples' mundane lives. However, let's face it. Most people cannot live by reality alone. Perhaps this is why so many spend quite a lot of effort (and money) on escaping reality. We daydream, we tell stories, we go to the cinema, we rent a

video, or we read or listen to a book. We immerse ourselves in imaginary worlds and stories as way of escaping every day life. We immerse ourselves in *fiction*.

In our recent research, we have been exploring the design, implementation, and user experience of context-aware and location-based mobile information services for urban dwellers, which "augment the city" with a digital layer of information about, for example, people, places and the users' physical surroundings (Paay et al. 2009). Common to our research has been that the systems and services explored have provided users with factual information that would otherwise be invisible. From this information people can then decide what to do while socialising out on the town; where to go, how to get there, what to do there, who to meet up with etc. In many ways, this matches the majority of research and design being done within the area of mobile guides: catering for the "social butterflies" of the city (Foth et al. 2009) by providing users on the move with facts about the social and physical reality that they are situated in.

However, why not let mobile guides provide people with fiction about their physical surroundings rather than facts alone? Inspired by this question, we have engaged ourselves with a theme of research exploring the user experiences achieved by "augmenting the city with fiction" in a way that is playful, ambiguous (Gaver et al. 2003) and opaque, rather than goal-oriented and transparent. This evokes some fundamental questions as little is known about how people would engage with this type of creative content embedded into their physical surroundings. How can location based mobile systems provide for peoples' desire for fictional content? How can we narrate engaging interactive stories in an urban environment taking into consideration the user's location, movements over time, and perhaps even their social context? How does the interplay between stories, locations and people function? What is the relationship between interactivity and narrative structure in this particular context? These are some of the many questions inspiring our current work facilitating urban citizens to engage with their physical surroundings through embedded creative content, and thereby form engaged relationships with their urban environment. In this chapter we will approach and discuss some of these on the basis of our experiences.

2. Related work

Making interactive narratives and relating stories to locations are not new ideas on their own. However, combining the two into mobile systems that respond to the users location and interactions in an urban environment is a relatively new phenomenon with key references in the research literature dating only a few years

back. In the following we outline some of the related work within mobile location-based guides, games and stories, and within interactive narratives.

Mobile location-based guides, games and stories

Early mobile city guides such as *Cyberguide* (Abowd et al.1997), the Lancaster *GUIDE* (Cheverst et al. 2000) and *Hippie* (Gaver et al 2003) provided urban dwellers, visitors and tourists with location-based experiences which included pertinent information and guidance about the urban environment around them. While they did not focus as such on narrative content, these systems still act as useful references for understanding some of the basic interaction and technical issues related to the design and user experience of mobile systems for city contexts. Mobile games such as *Pirates*! (Bjork et el. 2001), *ARQuake* (Piekarski and Thomas 2002), *Mindwarping* (Starner et al. 2000) and *Can You See Me Now?* (Benford et al. 2006) represent a different genre of location-based applications targeted at people in cities. These systems offer important inspiration for alternative purposes of mobile technologies in urban environments, such as facilitating entertainment and engagement. In particular, *Can You See Me Now?*, with its engaging artistic experience of seamlessly connecting online players in a virtual world to play against real players in the actual city, demonstrates new forms of human interaction with computers, and with each other, in the context of the city. Expanding on the creation of engaging gaming experiences in urban environments, others have actively incorporated story elements into their location-based games. *Backseat Playground* (Gustafsson et al. 2006) provides a narrated experience interweaving a crime mystery, visible physical elements of the environment, and gaming, for children sitting in the back seat of a car while on a journey. *Uncle Roy All Around You* (Benford et al 2004) is a programmed game that involves the surrounding city, live actors, online and street players to follow a set of pre-scripted clues and story elements to find Uncle Roy's office.

Moving away from the gaming genre, the delivery of location-based stories using mobile technology includes systems such as *Urban Tapestries* (Jungnickel 2004), *Riot!* (Blythe et al. 2003), *Hopstory* (Nisi et al. 2004) and *Geist* (Malaka et al. 2004). *Urban Tapestries* is a collection of stories, histories, experiences and events of a community linked to familiar and related locations. *Riot!* delivers authored episodes triggered by specific locations about a historical riot in and around Queens Square where the installation operates. *Hopstory* allows visitors to an historic brewery to collect location related video vignettes as they navigate the building, and then view their collected story at the end of the visit. *Geist* provides and augmented reality experience for visitors to the city of Heidelberg, which

combines history and fiction to allow the viewer to experience how it felt to be in that city during the 30 Years' War in the 17th century.

These mobile guide, game, and story applications all illustrate systems that in different ways facilitate people engaging with the city around them. While we have not ourselves worked with mobile games, our research within urban informatics has involved both mobile guide type of applications and, most recently, mobile interactive stories.

Anecdotally, peoples' desire for stories and the importance of fiction can be observed in many popular stories of our time. Several best-selling novels have illustrated the appeal of blurring the boundaries between fact and fiction, supporting a need for the "suspension of disbelief'" in story telling. As one of many examples, the Da Vinci Code (Brown 2003) sold over 80 million copies, was translated into 44 languages world-wide, is the thirteenth best selling book of all time, and inspired a feature-length movie which was internationally the second highest grossing movie of 2006 (Box Office Mojo 2009), world-wide. The Da Vinci Code establishes its sense of intrigue and allurement from a clever interweaving of real places and things that we know to be historical facts with "believable" fictional stories involving these places and facts as central elements. Crime fiction becomes all the more evocative when it locates its scenes in places that we are familiar with, and invites us to believe that this has happened in that location. For example, crime stories by Melbourne writer, Kerry Greenwood, about a Melbourne baker (Greenwood 2004, 2005, 2006) walks us through the streets of Melbourne and possibilities of dark happenings that we are unaware might be occurring in the city we think we know so well. This technique is also brought into play in *Riot!, Hopstory*, and *Geist* (Blythe et al. 2003; Nisi et al. 2004; Malaka et al. 2004) described above.

At the same time, we have experienced a meteoric rise in popularity of personal music players over the last decade, such as the Apple iPod, and mobile phones with audio playback capabilities. While these were originally used primarily for listening to music while on the move, new types of digital audio content, such as pod casts, have emerged in the slipstream of these devices. Others, such as audio books, have increased in popularity. The same is now also happening with digital video content for mobile devices. However, we have yet only seen the beginning of what is to come within the area of digital mobile media used by people. As has been the case with all other new media in modern history (e.g. printed books, theatre, radio, movies, TV, the Internet, etc.) the initial use of new media imitate that of old and familiar ones (e.g. filming theatre for playback in cinemas). Following a period of imitating the old and familiar, new genres emerge from

experimentation with the new means of expression afforded. For digital mobile media we are still in the imitation phase, but experimentation with, for example, location-based guides, games and stories are contributing to the development of new genres and usage of this type of media incorporating our urban surroundings into interactive stories.

We have the desire for fiction and engaging content, we have the context of the urban environment, and we have the digital devices and infrastructure to build such systems – but do we have the ability to integrate these in a meaningful and engaging manner?

Interactive narratives

One of the specific things that need to be investigated further before well functioning and engaging interactive location-based stories can be created is the relation between facilitating user interaction and ensuring narrative structure.

A lot of research has been done within the area of designing and implementing computer-based interactive narratives. One of the many challenges revealed by this research is the fundamentally conflicting relationship between interactivity and narrative structure (Galyean 1995, Skov 2002, Juul 2005). In traditional narratives the author has control over the storyline and sequence of events, and the receiver takes the role of a non-interactive or spectator audience. This means that the author can make use of classic principles of storytelling such as creating a plot, building up tension, introducing key characters at key times, deciding courses of action taken by each character, etc. When a narrative is made interactive, some of this control is by definition lost. The more interactive a narrative becomes, the less control the author has over the storyline. Consequently, increasing interaction often result in reduced narrative quality.

At the same time, many interactive narratives exist that exhibit both user interaction and narrative structure. One of the ways to overcome the conflict between interaction and narrative structure is to limit interactivity to happen within certain boundaries of the storyline, and combine this interactive freedom with narrative structures that forces the reader through certain key scenes. In this way, one of the fundamental principles of classic storytelling, the Aristolian curve of tension, can still be deployed to ensure an experience that captures the reader's imagination, provides context, builds up momentum, crosses the point of no return, and ultimately escalates towards and beyond a climax (figure 2.1).

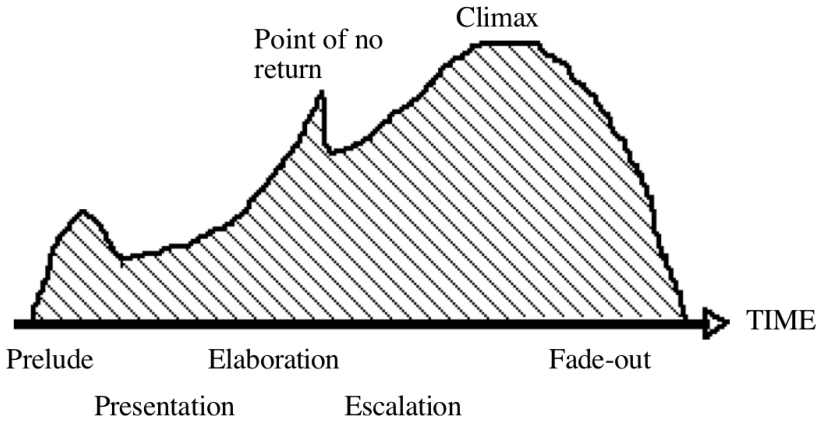

Figure 2.1. The Aristolian curve of tension (from Skov and Andersen 2001)

In an interactive narrative built around the Aristolian curve of tension, interactivity happens within the boundaries of the current phase or act of the story. The order of particular sub stories may change and choices may be made that have influence later on, certain sub stories may be omitted and others included, but the overall storyline keeps progressing towards the next step on the curve in a timely manner. Many different variations of the points of no return may exist depending on the choices made, but ideally *a* point of no return is always reached within a certain time. The same goes for the climax and ending. Interactive narrative research forms a good foundation for how location-based stories might unfold combining interactivity and storytelling structure.

3. Augmenting the city with fiction

Inspired by the 2006 OzCHI keynote presentation by Bill Gaver in Sydney, Australia about "Designing For Our (Sur)real Lives" (Gaver 2006) we decided to explore an orthogonal approach to our previous work on the design of location based urban guide systems (Paay et al. 2009). Rather than augmenting the city with facts, we wanted to explore augmenting the city with *fiction.*

Augmenting the city with fiction through location-based mobile technology inherits the challenges of interactive narratives above and adds these to the complexities of location-based services and urban informatics. In augmenting the city with fiction, narratives are linked to specific physical locations, and the user can interact with the storyline, amongst other mechanisms, just by moving through the urban environment. While allowing the user a large degree of freedom, key points in a narrative can be linked to specific locations, thus requiring the user to go to this particular place as a part of the experience. However, linking narratives

to a specific physical location adds to the means for expression available to the author by creating an opportunity to use features of this location as a backdrop for their story (e.g. visuals, sounds, smells, buildings, typical people etc.). At the same time, of course, the use of this effect also potentially makes stories sensitive to the dynamics of physical space, for example, at different times of the day and across the seasons of the year. This in turn can also be regarded as creative opportunity for storytelling.

In order to explore these interesting new challenges and opportunities for urban informatics we set up a project in 2007 involving a class of 18 Informatics students at Aalborg University's Department of Computer Science as a part of their 5th semester project. The students were divide into 3 groups and given the overall assignment to sketch, design and implement a mobile location-aware system providing an interactive narrative using the physical surroundings of the city as a backdrop. From ideation on different story concepts, figure 3.1 shows some of the early sketches produced exploring fiction in the city.

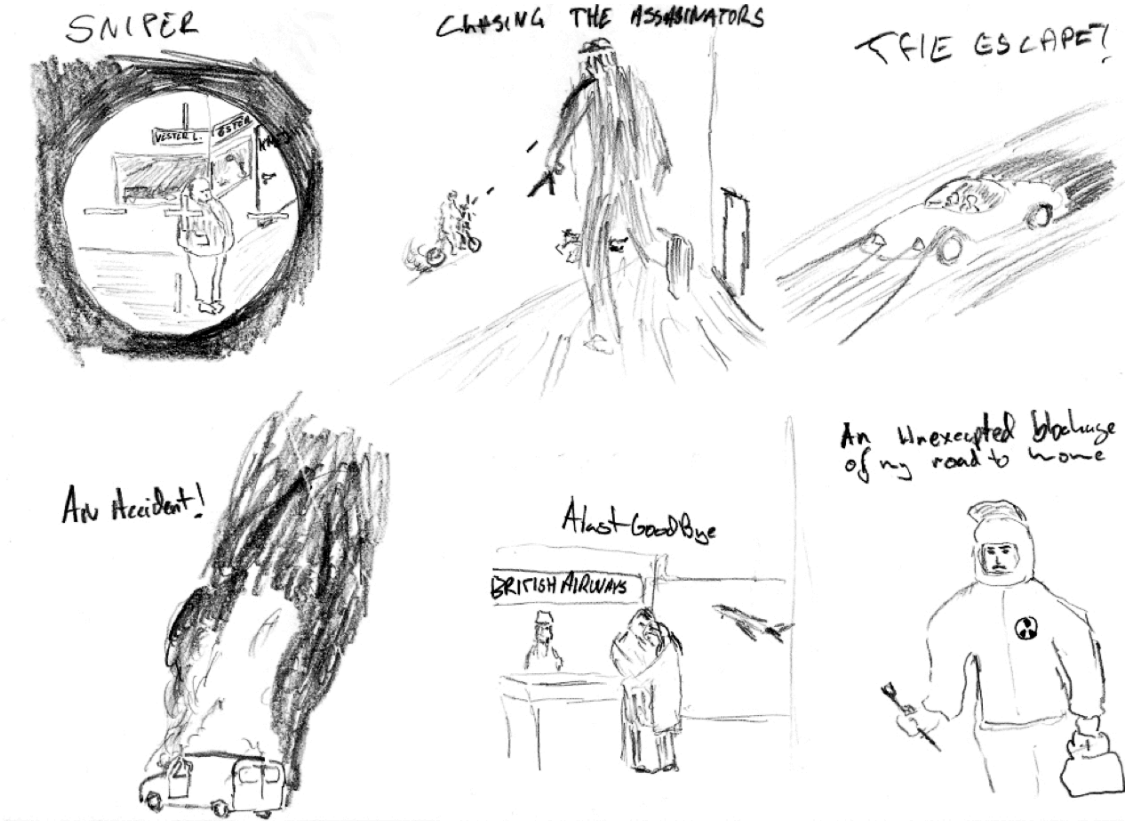

Figure 3.1. Design sketches for themes of fictional content exploring urban environments or specific places in the city as backdrops

From ideation on technology, the sketches depicted in figure 3.2 show two different concepts for accessing the otherwise invisible digital layer of fiction in the

city using tangible physical artefacts such as a pair of binoculars, that take the viewer back in time, and the rear-view mirror of a car, showing virtual characters in the back seat.

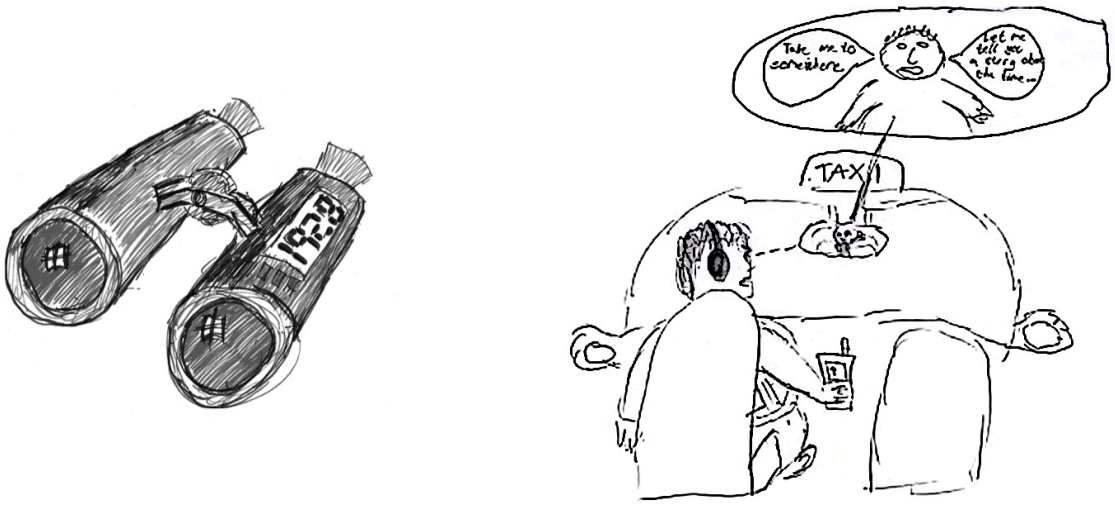

Figure 3.2. Design sketches for *Time Binoculars*, and *Ghost in the rear-view mirror*

Following the ideation process, the student groups chose one particular concept to develop further and demonstrate through a functional prototype. The three prototype systems each explored a different genre of storytelling: a murder mystery, science fiction, and film noir, and were all of them successful in creating engaging user experiences. In the following we focus on the last of these three concepts, the film noir story, entitled "Bjørnetjeneste".

4. Bjørnetjeneste

The Danish term "bjørnetjeneste" can be directly translated into "bear favour". It stems from an 1800th century fable by the French poet Jean de La Fontaine about a bear that threw a massive stone at his master's head to wipe away a fly but instead ended up crushing his forehead. Based on this story, a bear favour is a well-meant act of help, which turns out to do more damage than good. However, about 15 years ago, a survey revealed that many people in Denmark did in fact not know the correct meaning of the term. Half of the surveyed population thought it was a bad thing (the correct interpretation) while the other half thought a bear favour was a good thing – a big favour. In reaction to this, the Danish Language Committee (the official regulatory body of the Danish language under the Danish Ministry of Culture) decided to *officially change the meaning of the term* to reflect *both* common understandings although they had diametrically opposed meanings (Politiken 2005). As a consequence the term bjørnetjeneste is now totally ambiguous – and therefore in practice completely useless. It depends completely on its context of use and in reality needs to be accompanied by a description of the

intended meaning. In this way, the very meaning of the term has become as dual-sided as the concept it originally described! This peculiarity of the Danish language along with thoughts about fate and conscience (figure 4.1) inspired the concept and storyline of the location-based interactive narrative called "Bjørnetjeneste". The story is about good and bad, not always being able to tell the difference between the two, and sometimes making choices based on best of intentions that turn out to have an unforeseen negative consequence.

During the experience of the story, the user (or rather "interactor"), acting on behalf of the main character, a postman, has to make a series of ethical choices according to their conscience as an urban citizen. However, no matter what choices are made along the way, they will only make the situation worse and eventually lead to the same film noir type ending. Fate – unlike the meaning of words – cannot be changed, and the ending for the postman is inevitable.

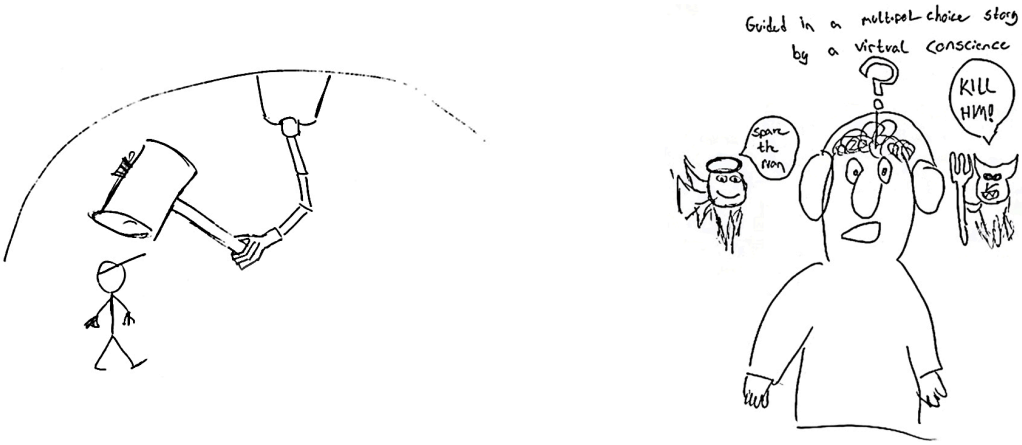

Figure 4.1. Early design sketches exploring fate and conscience that developed into the *Bjørnetjeneste* concept

5. The Bjørnetjeneste prototype system

Bjørnetjeneste was designed to run on a lightweight tablet computer with a pair of headsets and a GPS. This form factor allowed the use of detailed graphics and stereo sound to convey the story in response to the user's location in the city. As the user moves through the city, he is presented with a series of photographs on the screen, taken from his current location, overlaid with animated 3D graphics of characters and objects from the story. Spoken narration, dialogue, the thoughts of the main character, and user choices are delivered through the headset, and the user can respond through simple spoken commands (figure 5.1).

Figure 5.1 Bjørnetjeneste in use

The graphics used to convey the story are designed to clearly stand out from the photograph in their style and colour thus creating a clear figure-ground boundary and drawing attention to the fictional elements overlaid on the urban environment (figure 5.2). The effect sought by mixing photographs and graphics as illustrated above is one of augmented reality, but without the use of high-tech display equipment.

Figure 5.2. Photographs of physical surroundings overlaid with 3D graphics creating a composite scene of fiction in the city

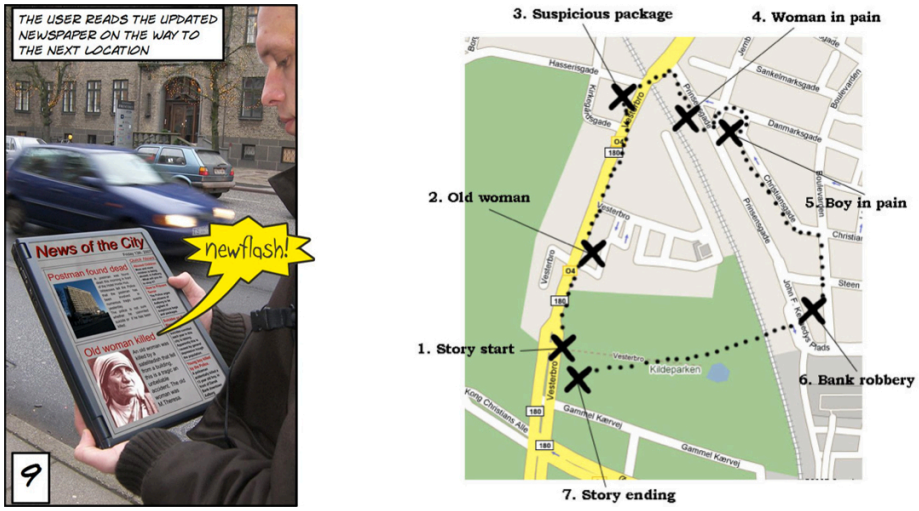

Figure 5.3. The dynamic newspaper (left) and the location of the seven scenes along a predefined route taking the user back to the starting point (right)

The secondary role of the tablet PC is to intermittently display the cover of the local newspaper as the interactive story unfolds. This is used to convey the updated effect of the user's actions on the fictional world that he is immersed in. Similar to the story of Marty McFly and Doc Brown in Back to the Future II and III (Zemeckis and Gale 1989, 1990), the headings and stories in the newspaper change content to reflect the implications of the actions taken by the postman (figure 5.3 left). Along with the tablet computer and headset, the user is given a series of physical props at the beginning of the story experience: a postman's jacket to wear and a postman's bag containing letters and parcels. These props play particular roles in the course of the story.

6. The storyline

The storyline of Bjørnetjeneste follows a day in the life (or death) of a postman in Aalborg. The story requires the user moves physically through the city following a predefined path (unknown to them) between a series of key locations where the story unfolds (figure 5.2 right). During the story, the user is prompted for interaction that influences the choices made by the postman. There are seven main scenes in the story. In the following, we describe three of these to give an impression of their content and form. Common to all, the postman is put into situations where he has to make a choice between good and bad. Should he help a person appearing to be in need or should he just mind his own business? However, no matter what he does, his day just gets worse.

The suicide

The story opens in the parking lot outside the tallest building in the city, Hotel White House. Here, the user is immersed into the character of "the postman". He is told that he has just committed suicide by jumping off the building, and on the screen he can see his own dead body in a pool of blood on the ground. He remembers that he is married and has a 12-year old son, and he feels that something terrible has happened, but he can't remember what. An old man then approaches him and says: "Well, that didn't go too well did it? I have been talking to the grumpy man in the cellar about your fate, and we have decided to give you another chance". The old man hands him a newspaper, and when the postman looks up, the old man has disappeared. He looks at the paper again. The top story is about a postman, who has died by falling from a building. The police are uncertain if it was suicide or an accident, but they believe that the incident may be related to a series of other events in the city centre nearby on the same day. The postman's heart begins to pump faster, and suddenly the old man appears next to him again. "So, are you up for the task of seeing if you can get things right this time, or should we just decide on who gets your soul by flipping a coin?" the old man asks. The postman accepts the challenge, closes his eyes, and is taken back to earlier in the day, when it all started. He is at the beginning of his normal route, and starts walking down the main street to deliver his letters and parcels.

The old lady

The first incident happens a block down the main road. Here the postman encounters a little old lady who asks him to help her cross the street (figure 6.1). Two voices appear in his head (through the headset). One tells him not to waste his time on charity while the other tells him that he should always help other people in need. The two voices continue to debate in his head, and the postman (the user) has to make a choice. The two choices and resulting storyline are described below.

Figure 6.1. Encounter with the old lady

A. The postman helps the lady across the street. As they reach the other side, they hear a strange noise from above. Then a large satellite dish plunges into the ground right in front of them. The old lady starts to look faint. She loosens her grip on the postman's arm, and drops dead from a heart attack. The postman reaches for his newspaper, and sees a new story appear describing the death of an old lady apparently caused by the reckless act of a postman walking her to an area on the sidewalk where workmen were installing heavy equipment on the roof of a city building.

B. The postman ignores the old lady and walks on. The lady starts yelling at him, and bystanders show their disrespect calling him selfish and un-community minded. The postman runs away from the scene. As he turns the corner, his attention is drawn to his newspaper. On the front page, a story appears describing the death of an old lady, who was run over by a bus while crossing the street. The bus driver didn't see her. "If only someone had helped her crossing the street", the bus driver is quoted as saying. "People only think about themselves these days".

Woman in pain

The postman is shaken, but continues on his delivery route. As he turns around the corner he hears a woman screaming in pain coming from one of the buildings. Once again, voices appear inside his head. One demands him to act like a man and take immediate action to save this poor woman in distress. The other voice tells him to just stay calm, deliver the mail to the building. The postman must make a choice between these two courses of action.

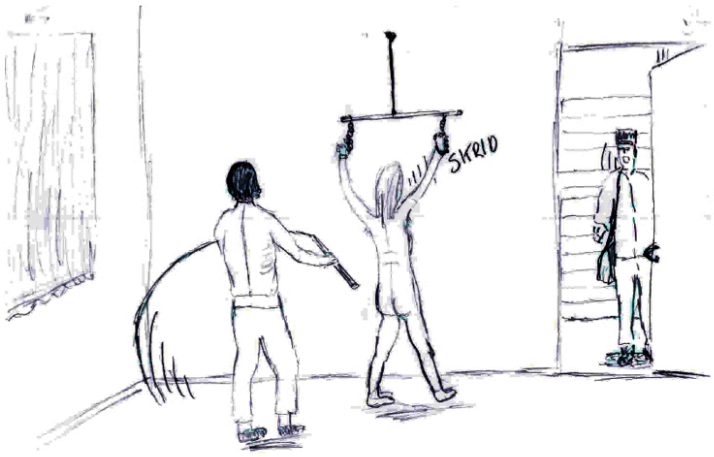

Figure 6.2. Pleasure or pain?

A. The postman decides to rescue the woman. He walks to the apartment where the screams are coming from and opens the door. He enters a dark hallway with lights at the end. He walks to the end and pushes the half open door. Inside he sees a woman, naked and chained to the ceiling. Behind her is a man, naked from the waist up, with a black leather mask covering his face, and holding a whip (figure 6.2). The woman looks at the postman and yells: "Get out you pervert!" The man with the whip joins in: "hey, I know you, you are the local postman. I always knew you were a bit of a pervert. I will tell everyone that you go around spying on other people's private business. Now get out!" The postman runs to the front door. Embarrassed with the voices in his head laughing at him.

B. The postman chooses to ignore the screams. He approaches the building, quietly slips the letters into the letterbox, and hurries outside. The screams continue, but he ignores them. "Its probably just the TV", he thinks, but the voices in his head remind him about his newspaper. He pulls it out and has a look. The front page shows a gruesome story about a raped and murdered woman. The address is the same as on the letters he has just delivered, and the picture shows the front door he has just been standing in front of. The postman feels sick, and wonders if he should contact the police, but the voices in his head remind him that there is no time for remorse or guilt - if he wants to save his own soul.

The story continues like this and leads the postman through increasingly tragic episodes, eventually resulting in the death of his son and 4 other children in a shooting near the Hotel White House. After this, the postman finds himself back in the parking lot outside the hotel, where the story began.

The end

Fuelled by distress, the postman enters the public elevator in the Hotel White House and heads for the observation deck on the top floor. As he reaches the top floor he is met by the old man from earlier in the day. The old man shakes his head and says, "Well, that didn't go too well either did it? The guy upstairs is really pissed off at me for playing this trick on you, but I guess that's why they call me a devil. Now, go ahead and finish it off. Let me see you jump again. You have certainly got every reason in the world". Voices start inside the postman's head. One begging him to walk away, the other agreeing with the old man that the

postman's fate is the hard concrete carpark 16 storeys below. For one last time, the postman (the user) has to make a choice.

A. The postman decides to jump. He walks to the edge. Pauses, then takes one big step forward, and plunges to his death. The old man laughs and says: "I always knew you would jump. They always do".

B. The postman decides to live. He moves towards the elevator, but as he walks along the side of the building he is caught by a strong wind and swept off the building. He plunges to his death. The old man laughs and says: "you really thought you had a choice didn't you? They all do".

As the user exits the building on the ground floor, an old man approaches him and says: "Well, that didn't go too well did it? I have been talking to the grumpy man in the cellar about your fate, and we have decided to give you another chance". The user can then go through the story again, trying to alter the outcome. But as *we* know, the fate of the postman cannot be changed.

7. User experience test screenings

The user experience of Bjørnetjeneste was studied through a small number of studies on location in the city centre of Aalborg. The user experience studies specifically did not focus on the usability of the concept or system, but on peoples' reactions and responses to it. Hence, these studies deliberately took the character of "test screenings" of a movie or TV show in order to gauge audience reaction (Cousins 2004) rather than that of user-based evaluations of a computer system. Consistent with the type of focus for a test screening, we were interested in peoples' responses to the general concept of embedding fiction into an urban environment and how people engaged with the urban environment throughout the experience. We were also interested in their opinions about the experience of the Bjørnetjeneste story as an example of fiction in the city, and we were interested in the interplay between the physical backdrop of the city and the fictional content when embedded in this setting through graphics and sound.

The "screenings" of Bjørnetjeneste took place at two different points of the design process. The first screening (with 5 people) took place after the basic storyline and concept had been conceived, but before any functional prototype was created. In place of the tablet PC, this screening made use of a paper prototype of the system with sketched content and dialogue read by a person (figure 7.1). The screening focused on the overall concept and storyline, and led to changes to both.

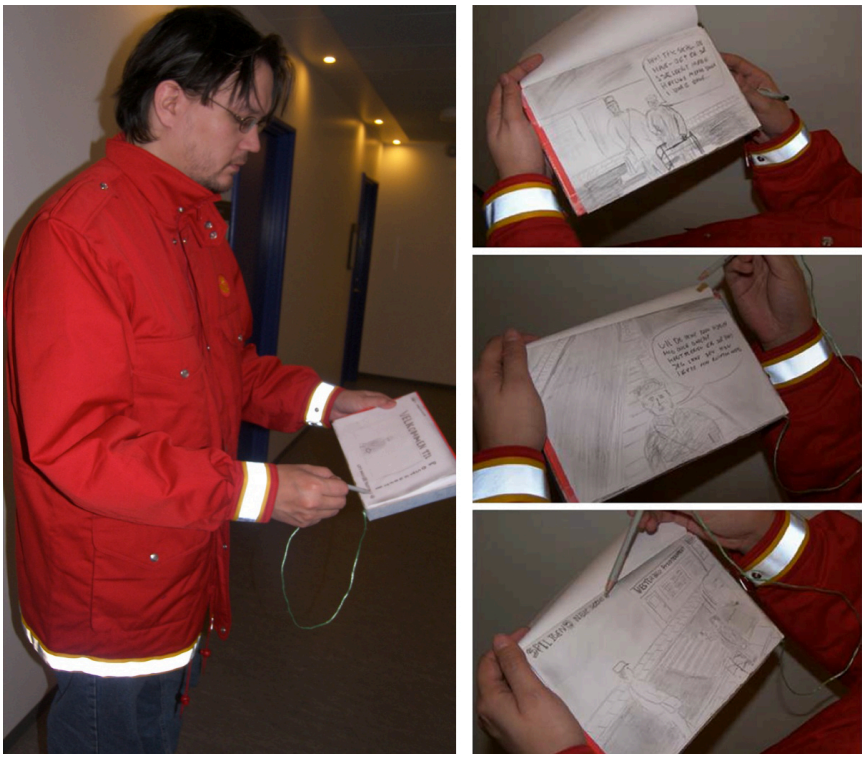

Figure 7.2. Test screening 1 with a paper-based storyboard

The second screening made use of a functional prototype system with interactive graphics and digital audio (figure 7.2). This enabled the user to experience the photographs augmented with 3D graphics, and the spoken narration, dialogue, and especially the stereophonic "voices in the head" envisioned for the concept.

Test screenings took place both at the university as walkthroughs (5 people) and on location walking through the city centre of Aalborg (3 people). Responses were collected through note taking during the screening and post-screening spoken feedback.

Figure 7.2. Test screening 2 with a functional prototype on a laptop computer (wrapped in plastic because of the rain)

8. Discussion

The purpose of Bjørnetjeneste was not to create a "useful" user experience in the traditional sense of the term, but rather to create an urban experience that builds a relationship between the user and their city, being aimed at regular denizens rather than tourists. It plays with the user's sense of community and social conscience, and the aim is to make it an immersive, thought provoking, emotionally engaging, fun, and frustrating experience.

The two test screenings of Bjørnetjeneste provided feedback on the overall concept, the story, and the functional prototype. As it was not a full-scale or formal evaluation, we will refrain from making definite conclusions and generalizations. Instead, we will merely present and discuss some of the qualitative feedback gathered.

The first test screening focused on the overall concept and storyline and led to modifications of both. Getting this feedback at an early stage was valuable as it would have been time-consuming to make these changes to the overall concept and storyline later in the process. The initial test screenings confirmed that the concept was comprehensible, interesting, and that the basic storyline made sense and built up tension over time regardless of what choices the user made. It was also confirmed that the narrative appeared and felt interactive despite the relatively simple possible choices and the relatively fixed structure hidden underneath the surface. However, it was also found that the storyline itself had to be simplified in order to ensure that it made sense and built up tension regardless of what paths were chosen by the user. As the initial story appeared a bit too much like a game with right and wrong answers, the choices presented to the user were made harder and the outcome more ambiguous. Adding to this effect, and in line with the concept of film noir, it was decided that the story should end with the death of the postman regardless, removing the experience further away from a game in which the user has to "save" the main character. Finally, the originally envisioned use of physical props was reduced due to the practicalities involved with carrying and handling these alongside the tablet PC. The remaining props were the postman's jacket, the mysterious parcel, and a mobile phone.

The following feedback emerged during the second test screening with the prototype system on a PC tablet, headphones and props that took place in the streets of Aalborg. Participants found the whole experience, including wearing an actual Danish Post outfit and carrying an actual mail bag very immersive. Because this was the outfit of actual postmen, rather than a fancy dress costume, there were no concerns about feeling as if they were on show, or looked silly. In fact, they quite quickly assumed the anonymity of postmen walking around our cities,

even though they were carrying a tablet PC, because the postman is often encumbered by various bags, parcels and letters that he is carrying.

As we have found with other *fiction in the city* systems that we have evaluated in situ (Paay et al. 2008), the storyline woven around familiar and not so familiar parts of the city gives people a new perspective on their urban environment. They discover new aspects of their city, or take time to look at the detail on the upper floors of buildings that they would normally just walk past with their eyes down. When they imagine stories that might conceivably be happening behind those facades they begin to consider the lives of those around them and thereby forge a kind of relationship with other urban dwellers – even though they remain as strangers. One participant began to think about the lives of real people that passed her during the test screening session, and even imagined her own storylines, beyond that of the system, that interwove the strangers passing into her experience of the system.

With Bjørnetjeneste in particular, the fact that participants are challenged to make ethical choices about fictional people conceivably in their immediate environment makes them start to develop a sense of responsibility for the wellbeing (or not) of those around them. By making these choices for the fictional characters, they accept whatever the fictional social and environmental consequences of those choices might be, and they are forced to examine their own belief systems during the course of interaction with the system. This made the whole experience quite emotionally engaging and challenging for some of the participants whose only prior experience with this kind of situation was in gaming seated safely in their rooms in front of a PC, where their choices had no connection to real world situations.

In some parts of the storyline sounds were delivered through the postman's headphones that related story scenes that were taking place behind closed doors. These were particularly poignant for the participant as the suspension of disbelief was particularly strong in this situation. As far as your senses were concerned, there was a real person involved in a serious situation behind the door that you were facing who needed your assistance in some way – do you help them or not? This decision became much more realistic for the participant because they were right there, facing a very real door, in a ordinary everyday environment, hearing dialogue or sounds that they would indeed find troubling if it was not part of our interactive experience.

As with all artistic endeavors delivered in the genre of "noir" the aim is to give the consumer an experience that is disturbing, subversive, funny and poetic. Design noir is based on the premise that "Beneath the glossy surface of official

design lurks a dark and strange world driven by real human needs" (Dunne & Raby, 2001, p.6). Bjørnetjeneste delivered an array of such experiences to our test participants. Some of the choices that had to be made were all the more disturbing when the newspaper reflected back that something terrible had happened in the wake of their interference or complacency with the situations they were asked to intervene in. Some responded by desperately trying to make things right – others responded by purposefully (and subversively) trying to get a dramatic newspaper report as a result of their actions. Either way, the outcomes were "black". This produced both elements of fun in the experience and elements of frustration. For us, the reward was in the finding that using this system in the city was an evocative experience, which climaxed at the end where a final decision leds to the inevitable, and poetic, ending that is merely another beginning.

9. Conclusion

What would it be like if the city around us was digitally augmented with fiction? What kind of user experience could this provide urban citizens engaging with their community and their physical surroundings, while making ethical choices, through location-based fiction? These are the questions we have explored in this chapter. We have presented a case for anchoring fiction into peoples' physical surroundings, using this a backdrop for interactive narratives and responding to peoples' movements through the city. We have argued that this new genre of mobile digital content needs to be developed through experimentations with the new means of expressions afforded by this media, and described how we have done such experimentation through the development of three exploratory interactive narratives for urban dwellers in Aalborg. Our specific use of the digital mobile media for augmenting the city with fiction is illustrated through the Bjørnetjeneste concept and prototype system, which we have described here in some detail both in terms of user experience design, and in terms of the specific interactive narrative developed and explored.

Bjørnetjeneste and our other fiction in the city systems were designed to create an experience that is immersive, thought provoking, emotionally engaging, physical, fun, and frustrating - rather than providing functional utility. From the responses gained through our test screenings of these systems, we are sure that we did not create something with functional utility in the traditional usability sense of the term. We did, however, create something that people engaged with emotionally, were provoked by, and found both fun and frustrating at times. In that sense, we have succeeded in what we set out to do. However, the story does not end here. The concept and design study of Bjørnetjeneste only indicates that this is

a relevant and viable area for urban informatics, and that some subjective value can be created for urban citizens engaging with the city around them through the creation of engaging interactive location-based narratives. It is not in any way complete in terms of how the basic concept of augmenting the city with fiction could be explored, and how urban citizens can engage with people and the city through fiction. Further studies are needed to explore different genres of location-based interactive narratives, different types and levels of user interaction, different narrative structures, and different technologies. Story content should be created by professional writers, and systems should be created to reach a large cohort of people, facilitating user experience studies with more people and over longer periods of time.

Finally, we think it would be interesting to develop and explore application frameworks for creation and distribution of user-generated story content, enabling actively engaged urban citizens to participate in the media content creation side, weaving dynamic storylines based on who they are with and where they are in the city.

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