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Location-based games

from screen to street

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Ph.D. Dissertation

The Danish School of Education, Aarhus University
Center for Playware
Research Program: Media & ICT in a Learning Perspective
Research Project: Serious Games on a Global Market Place

LOCATION-BASED GAMES:

FROM SCREEN TO STREET

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Executive Summary

In this dissertation, it is explored which prerequisites are necessary in location-based games (LBGs) to make meaningful the meeting between players and spatiality with an emphasis on physical locations. Throughout the dissertation, it has been shown that LBGs affect players' perception of and behavior in everyday spaces, as the games reside on the boundaries between the continuums of *play* and *ordinary*, *authentic* and *fictional*, and as they merge *physical* and *digital* media. These are termed the six dimensions of LBGs. LBGs let the player explore the boundaries between these dimensions and the dimensions are related through play. The LBG acts as a mediator for the meeting between the player and locations through the boundaries between these six dimensions. The motivation of the dissertation is to push the development of and research in LBGs toward actualizing the potential for expanding LBGs' spatial aspect even further and to contribute with a cohesive framework on LBGs.

This dissertation consists of a review of previous research and existing LBGs, and a theoretical discussion of the elements of LBGs encompassing: *1) Spatiality*: space and place, digital space, mediated spaces (physical and digital), locations as play-spaces. *2) Structure*: rules, frames, fiction and authenticity, and uncertainty and ambiguity. *3) Interface*: Location-aware devices, seams, and objects and players. *4) Player experience*: Motivation, mobility, meaning, and finally, a discussion of flow, immersion or incorporation. The combination of these elements is used to conceptualize LBGs.

The theoretical point of departure for the dissertation is Maurice Merleau-Ponty's phenomenology of perception and Michael Apter's theory on motivation (reversal theory). The phenomenology of perception contributes with a framework describing our experiences of being in the world and the creation of meaning. The theory on motivation defines what motivation consists of and how it relates to our actions. This theory has been combined with theories concerning play and play culture, digital media, (digital) games, (optimal) experiences, landscape architecture, everyday practices (related to walking in the city), and the existing theories on LBGs as well as pervasive games.

The methodological approach incorporates design-based research. It combines and aims at improving design, research, and practice concurrently. A design of an LBG – *Visions of Sara* – has been created and implemented. It evolved out of the initial observations and

participation in three LBGs (*DJEEO Education*, *Land of Possibilities?*, and *Fruit Farmer*), the review of the literature, and relevant theoretical models. After creating *Visions of Sara*, three more LBGs were played and they are included as part of the empirical data – *Ghost Patrol*, *Spy in the City*, and *Foursquare.* These seven games, interviews, and observations, along with my own experiences both playing and designing are included in the analysis of the relation between locations and LBG; the ways in which players use them to create meaningful experiences; and of the prerequisites of a meaningful meeting between players and locations.

The dissertation contributes to the field of LBG research by offering an enhanced understanding of LBGs, and LBG player experiences, as well as providing an expanded vocabulary describing LBG elements. In addition, the dissertation provides design knowledge concerning creating LBGs that uses certain emergent opportunities when combining location-aware technologies with game mechanics to make use of the six dimensions of LBGs and to involve the player's body – i.e. make a meaningful meeting possible.

The practical contribution is my creation of the LBG *Visions of Sara.* People continue to play this game in Odense more than two years after its launch, and *DJEEO* uses it as a showcase, enabling the company to sell similar LBGs.

Resumé

Denne afhandling undersøger forudsætningerne for et meningsfyldt møde mellem spillere af lokationsbaserede spil og rum - med særligt fokus på fysiske lokationer. Gennem afhandlingen er det blevet vist, at lokationsbaserede spil påvirker den måde spillerne opfatter og agerer i hverdagens rum, da de befinder sig på tærsklen mellem tre forhold: *legen* og det *ordinære*, det *autentiske* og *fiktionen*, og blander *fysiske* og *digital* medier. Disse kaldes: 'lokationsbaserede spils seks dimensioner'. Lokationsbaserede spil lader spillerne udforske og relatere disse tre forhold gennem leg. Gennem disse seks dimensioners grænser medierer lokationsbaserede spil mødet mellem spilleren og hverdagens rum. Motivation for afhandlingen er at skubbe udviklingen af og forskningen i lokationsbaserede spil i retningen mod at realisere potentialet for at lade lokationsbaserede spil gøre brug af lokationer på en meningsfyldt måde samt at bidrage med en sammenhængende ramme for at udvikle og forstå lokationsbaserede spil.

Denne afhandling består af en gennemgang af den tidligere forskning på området og eksisterende lokationsbaserede spil, samt en teoretisk diskussion af de elementer lokationsbaserede spil omfatter: *1) Rumlighed*: rum og sted, det digitale rum, medierede rum (fysiske og digitale), brug af fysiske lokationer som spillerum. *2) Struktur*: Regler, rammer, fiktion og autenticitet, samt usikkerhed og uklarhed. *3) Interface*: 'Location-aware' teknologi, 'seams' samt objekter og spillere. *4) Spiller oplevelse*: Motivation, mobilitet, betydning, og til sidst en diskussion af 'immersion, flow og inkorporering'. Kombinationen af disse elementer bruges til at konceptualisere lokationsbaserede spil.

Det teoretiske udgangspunkt for afhandlingen er Maurice Merleau-Pontys kropsfænomenologi og Michael Apters teori om motivation. Kropsfænomenologien har bidraget med termer, der beskriver vores væren i verden og dannelse af mening. Teorien om motivation definerer, hvad motivation består af, og hvordan den relaterer til vores handlinger. Disse teorier er kombineret med teorier om leg og legekultur, digitale medier, (digitale) spil, (optimale) oplevelser, landskabsarkitektur, hverdagspraksis (relateret til at bevæge sig i byen), og de eksisterende teorier om lokationsbaserede spil samt pervasive spil.

Den metodiske tilgang er "designbaseret forskning" (design-based research). Tilgangen kombinerer og sigter mod at forbedre design, forskning og praksis. Det lokationsbaserede

spil – *Saras Syner* – er udviklet og implementeret i forbindelse med projektet. Designet er baseret på en litteraturgennemgang, teorier, observationer af spillere og egne erfaringer med at spille tre lokationsbaserede spil (*DJEEO Education*, *Mulighedernes land?*, og *Fruit Farmer*). Efter at have udviklet *Saras Syner*, har jeg spillet yderligere tre lokationsbaserede spil som er blevet en del af empirien, nemlig *Ghost Patrol*, *Foursquare* og *Spy in the City*. Alle syv lokationsbaserede spil, interview, observationer, egne spil- og designerfaringer indgår i analysen af forholdet mellem steder og lokationsbaserede spil, af de måder hvorpå spillerne bruger lokationsbaserede spil til at skabe meningsfulde oplevelser med samt af forudsætningerne for et meningsfuldt møde mellem spillere og steder.

Afhandlingen bidrager til forskningen i lokationsbaserede spil med en forståelse af det at spille lokationsbaserede spil og af spillene i sig selv, samt med udviklingen af begreber til at beskrive lokationsbaserede spil. Afhandlingen bidrager med viden, der gør det muligt at designe lokationsbaserede spil, som gør fuld brug af de muligheder, der opstår, når 'locations-aware teknologier' kombineres med spilmekanikker. Kort sagt spil, der gør brug af lokationsbaserede spils seks dimensioner og inddrager spillerens krop - altså gør en meningsfuld møde muligt.

Et mere praktisk bidrag er udviklingen af det lokationsbaserede spil *Saras Syner*. Dette spil spilles stadig i Odense mere end to år efter det blev lanceret. Spillet bruges endvidere som et "udstillingsvindue" for DJEEO, hvilket har gjort det muligt for virksomheden at sælge tilsvarende lokationsbaserede spil.

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Acknowledgments

This Ph.D. project is a part of the research project *Serious Games on a Global Market Place*, funded by the Danish Council for Strategic Research (KINO). The aim of this project is to create serious games globally based on Danish traditions of play and learning. This is done by unifying the forces of researchers, game developers, and educationalists. My specific focus was to explore "ambient playware" by identifying and uncovering the possibilities afforded by location-aware technologies, in relation to developing games that can engage players.

I have been working at the Center for Playware while working on my doctorate. *Playware* is defined as being "intelligent digital products that create play and playful experiences among users of all ages." The Center for Playware combines research on robotics, play culture, modern artificial intelligence, and pedagogy.

These past years have been an intriguing journey, and although it has been my journey, I have not traveled it alone. I would like to thank the people who made it spectacular. First, I warmly thank the players who have played with me! It was a pleasure to meet such great people, and I have spent many hours observing and listening to you, which have been fascinating.

To *DJEEO*, thank you so much for giving me the opportunity to work with you and your platform. I have enjoyed our time together and have felt inspired by your enterprise. I hope that your effort will push forward education and sports to the delight of future generations.

I spent a six-month tenure at Osaka University. In this regard, I would like to thank Associate Professor Katherine Isbister for helping me make contact with people in Japan. I would like to thank Associate Professor Hideyuki Nakanishi, Professor Hiroshi Ishiguro, and the staff and students at the Department of Advanced Machine Systems, Computer Science, Osaka University. I am amazed by your groundbreaking research and grateful to you for letting me be a part of your group! Thank you so much for your kindness.

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Prelude

Elsebeth has lived in Odense for many years. She is the field agent in the LGB *Visions of Sara*, and I am the base agent, guiding her through town from Odense's central library. At the moment, she stands at the town square in the center of Odense.

"I don't get it; read the poem again, please," Elsebeth says into the phone. She is looking for a clue to help her solve a riddle hidden in her surroundings. I read the poem aloud once more; it is about a "blind lamb" with a sword, something that the game's protagonist, "Sara," is seeking. Finally, the field agent, Elsebeth, says, "Now, I just learned something new about my own town," for she has found the statue of Justitia, the Roman goddess of justice, high up on the roof of Odense's city hall. "She is looking for justice," she tells me. I enter the answer, and she moves on to another location in town where our next challenge awaits.

The first comprehensive photograph of planet Earth was captured on November 10, 1967[1] by the United States National Aeronautics and Space Administration (NASA) (see Figure 1). We could see our planet from an entirely new perspective; we could marvel at the beautiful, colorful globe that we inhabit and ponder that it is just a small piece of the universe. Satellite technology made it possible to take this photo that has been said to have change the consciousness of the world (Ball, 2007). Now, more than 40 years later, satellites connect directly to our

Figure 1: Our planet as seen from outer space, 1967 (NASA - The United States National Aeronautics and Space Administration).

smart phones and other devices that employ Global Positioning System (GPS) technology. With one of these devices in my hand, I can access information about my immediate surroundings, as well as see images of the earth from above, as if I were in outer space, all while I am standing on its surface. I can tag my favorite café so that others can find it, or I can take a photo of a cat in a window, upload it to the photo-sharing website *Flickr*, and tag it with the exact location where it was taken. In the first case, the local becomes global but still provides information about the local environment. In the second case, an object not recognized as local in its origin (a non-descriptive cat that could live anywhere) becomes located and visualized through the global reach of information, without providing any information about the local space (Gordon, 2009). As with the NASA photograph, new perspectives reveal themselves to us due to technological development.

Nifty new cars are provided with location-aware parking sensors that warn the driver when the car is getting too close to obstacles, a radio frequency identification (RFID) chip in my car keys helps me track them when they are misplaced, and most new cell phones have a built-in GPS unit that helps the user navigate in the physical world (University of Washington, 2008). The number of applications that relate to the location of a device is increasing dramatically with the advent of "location-aware" technologies, technologies of

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[1] The first photo of Earth from outside the atmosphere was taken in 1946. This photo, however, did not capture Earth in its entirety.

spatiality that change the relationship between space and place (Dourish, 2006). Location-aware technology "knows" where it is, and thus it can adapt to that location; also, it allows the user to do the adaptation or provide information related to the immediate environment. Such technologies offer us new perspectives on ourselves and may even open up new ways to exist in the world. In fact, it has been argued that our use of location-aware technology is creating new types of space and practices (Borries, Walz, & Böttger, 2007a; de Souza e Silva, 2006; Jansson, 2006; Manovich, 2006; Meyrowitz, 1989, 2005), such as, e.g., location-based games (LBGs).

LBGs use location-aware technologies as part of their interface (Benford et al., 2003; de Souza e Silva & Sutko, 2009). They depend on portable digital technologies to interface between physical and digital space (de Lange, 2009). LBGs are not limited to a screen, nor are they limited to the physical world. They promote a "doubled perception" of space, enabling simultaneous access to both physical and digital spaces (de Souza e Silva & Sutko, 2011). The outcome of the LBG is affected by the player's interaction with physical locations and movement in a physical environment (de Lange, 2009).

Gaming is entering not only the streets but also our thinking and perspectives in a range of areas. At the same time, elements of reality are written into games. In other words, LBGs are a part of a larger trend: game-like structures are penetrating everyday life. This trend has been observed by researchers in recent years (Stenros, Montola, & Mäyra, 2007). Game structures or gaming is becoming more pervasive in our lives. In *Pervasive Games in Ludic Society*, Stenros, Montola, and Mäyrä (2007) argue that pervasive games, of which LBGs are a subcategory, emerge from three different trends: the blurring of facts and fiction, the struggle over the ownership of public space, and finally, the rise of "ludus"[2] (i.e., rule-based and structured play) in society. Games are entering the sphere of the ordinary, according to the authors, and this means that some people are increasingly prepared to experience the world through a gaming perspective. At the same time, real life is pervading games. In the presentation: *Design Outside the Box*, at the 2010 Design, Innovate, Communicate, Entertain (D.I.C.E.) Summit, Jesse Schell talks about the unexpected success of social media tools and games such as

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[2] *Ludus* is a term is linked to Roger Caillois (2001), who wrote the book *Les jeux et les homes* (in English: *Man, Play, and Games*), published in 1958 . He distinguishes between *paideia* and *ludus*. Caillois claims play exists in different forms that can be placed along a continuum on which one extreme is paideia (the unstructured and spontaneous) and the other ludus (based on explicit rules).

Facebook, *Farmville*, *Mafia Wars*, and *Nintendo Wii* (Schell, 2010). He posits that a common link these games and platforms share is that they tap into reality. In these games, we play against our real friends (e.g., *Farmville*, *Mafia Wars*) and we really control our avatar with our bodies (e.g., *Nintendo Wii*). He refers to the book *Authenticity: What Consumers Really Want* by Gilmore and Pine (2007) in which they conclude that the consumers have a hunger for reality. After years of dealing with "fake, virtual stuff," we want real action, real food, and real intrigues (Schell, 2010). Shell's vision for the future is that our real actions will be awarded with points, and that game designers will design the systems of society – he uses an example of a teacher in game studies who redesigned the grading scale adding experiences points to the scale to make it more appealing and useful to students and teachers (Schell, 2010). This is a kind of "gamification," i.e., gaming mechanics are applied to the ordinary world, but the *ordinary world* is also made part of *play* in games. LBGs rest on the threshold between these two spheres and relate to this trend. Further, *authentic* elements (real stuff) are pulled into *fiction* and fiction into reality. Finally, LBGs merge the use of *physical* and *digital* media. This dissertation argues that when playing an LBG, navigation between play and ordinary, authenticity and fiction, and physical and digital is at the core of the game-play.

LBGs have only been around for a little more than a decade (Sotamaa, 2002). There is a growing list of exceedingly interesting LBGs, such as *REXplorer*, *Uncle Roy All Around You*, *Can You See Me Now?*, *BotFighters*, *CitySneak*, *Frequency 1550*, and *Foursquare* to mention a few. LBGs offer potential within a range of fields: They offer situated engagement that can enrich educational practices. LBG development can be an additional source of knowledge that can be applied to technological development and use. LBGs have the potential to tap into local cultures and thus support development of urban areas. LBGs can be a new form of exercise. LBGs can be used for commercial and marketing purposes. These represent some of the potential applications that look promising for the continued development of these new types of games. However, some have claimed that few LBGs[3] result in commercial success (Kristiansen, 2009; Svahn & Lange, 2009). One reason there have been few commercial LBGs is that the technology has not been accessible and mature enough until recent years; thus, most LBGs have been developed in research labs. This is changing with the emergence of smart phones, and more and more commercial LBGs have surfaced. Another reason for the lack of successful commercial LBGs could be that we are somewhat blind to the true

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[3] Svahn and Lange mention "location-based pervasive games".

possibilities of using physical space, due to the success of video games (de Souza e Silva & Sutko, 2009), and it is difficult making games that use the possibilities for using physical space (Kristiansen, 2009). What differentiates LBGs from video games is that they pervade physical space (Benford et al., 2003; de Lange, 2009; de Souza e Silva, 2006; de Souza e Silva & Sutko, 2011; Gustafsson, Bichard, Brunnberg, Juhlin, & Combetto, 2006). Perhaps because we look too much at video games when developing LBGs, the relation between LBGs and locations is claimed often to be somewhat coincidental (Waern, Montola, & Stenros, 2009). Therefore, this dissertation analyzes and defines LBGs with a focus on spatiality. The way locations are configured and understood in LBGs is different from space in traditional digital games. In digital games, the use of particular spatial elements is intentional in the game: every door, tree, and road is designed to add to the overall game experience. It happens that players find "cracks" or errors in the design, which they can make use of in the game, although they were not the designer's original intent. Yet these cracks are still framed by the game. This is different when the streets of an ordinary town are incorporated into an LBG. Here, nothing is created to serve the purpose of the game. Such use calls for an alternative design approach, different from the one used in traditional digital games played in digital worlds. Designers of LBGs should focus on understanding how the physical environment can be turned into play-space (Nova & Girardin, 2009). Design of LBGs calls for attention to the merging of play and ordinary, authenticity and fiction, and to the use of physical space in which digital code is embedded.

Live-action role-playing games (LARPs) are games played in layered physical spaces, as players need to imagine a secondary world in the physical world. In LARPs, players are bodily present in the game world, as they are in LBGs (Cashman & Phelps, 2009). It has proven fruitful to relate elements from LARPs to the design of LBGs and pervasive games (Cashman & Phelps, 2009; Copier, 2005; Waern et al., 2009). Insights from these studies have been used in the dissertation to some extent. However, often LARPs require carefully staged environments (Waern et al., 2009), and LARPs do not necessarily address the relationship between physical and digital space. The LBGs studied in the dissertation are not necessarily about immersive experiences and role-play. LBGs are not technological extensions of LARPs, and although relevant, it falls out of the scope of this dissertation to study LARPs in relation to LBGs.

In conclusion, research and development of LBGs is in its development phase. Supporting the development of LBGs, so that they can use the true potentials of using physical space, and thus can enrich a variety of fields is a motivational factor in this research project. The focus is about leaving a bigger screen – the realm of digital games – and entering the streets of a city, and about the challenges and opportunities related to designing LBGs.

This dissertation contributes to the research field by serving as a cohesive model for conceptualizing, analyzing, and designing LBGs. Much valuable research has been completed concerning LBGs, although most of it still relates to specific elements of LBGs and does not provide a cohesive framework. Notably, Kristiansen (2009) has completed a dissertation on site-specific games, which are a subcategory of LBGs, providing a model for designing site-specific games. De Souza e Silva and Sutko (2009) have co-edited an anthology with individual chapters on LBGs that explore these games from three angles: theory, design, and education. Walz (2010) has written a book with a focus on games and architecture that treats LBGs as one application area. The purpose of the book is to develop and architectural understanding of play and games, and typologies of playgrounds. Finally, Montola, Stenros, and Waern (2009) have provided us with a cohesive framework for understanding and designing pervasive games, and although it is not concerned specifically with LBGs, it provides insights fruitful for these kinds of games as well.

The dissertation contributes with design knowledge and offers models for analysis and design. It also sheds light on the implications beyond design, arguing and showing how LBGs reveal new perspectives on our world; and how they affect our movements in and perception of everyday spaces. The dissertation contributes by analyzing and describing how locations and environments are actively affecting the player and thus the play experience. It describes play dynamics specific to LBGs, and analyze how productive players create meaning in the places of the ordinary world while playing. Meaning is created in the interaction between the conscious person (body and mind) and an object or idea toward which this person is directed (Merleau-Ponty, 2002). This idea of direction of intentionality is relevant when trying to understand players' actions but also when trying to understand their expectations regarding what they meet. The dissertation analyzes the role of intentionality in LBGs: Players have intentions; there are intentions in the game; and in the surrounding world too. Through these contributions, the dissertation contributes on three levels: it

advances theoretical development, it provides empirical examples, and it offers practical design knowledge for LBGs.

In LBGs, players must move been locations in the ordinary world to play. There is no reason to design a game set in the physical world if the game does not make use of the possibilities that are distinctive in this space. To design such a game we must know how to use ordinary-world locations as play-spaces. The design must aim at creating a tool, the LBG, with which players can create a meaningful experience, i.e., an experience that the player enjoys. We need to understand the elements of LBGs to understand the tool for creating experiences. Finally, we need to take into account the player's perspective and the experience that is created when playing the LBG, as this informs game design. Thus, the research needs to reflect on the relationship between the three entities: LBG, locations (spatiality), and player experience, and relate these to LBG design.

The goal is to create LBGs that have more than a coincidental relation to physical locations and actually make use of its possibilities. Thus, the overall research question is:

> Which prerequisites will make the meeting between LBG player and spatial locations meaningful to the player?
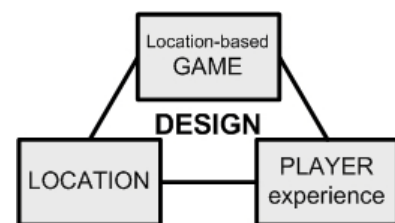
Figure 2: The main inquiry.

In this dissertation focus is on the *meeting* between players and locations within the frame of the game. The goal is *not* to develop typologies of game- and play-spaces as Walz (2010) has done, but to examine the relations between the three entities. It is to study the meeting between LBG player and location as it is facilitated by an LBG. There are multiple layers in this question, and it must be divided into subtopics in order to study it. The following subdivisions each shed light on a part of the overall inquiry.

To develop a design approach that supports creating LBGs that facilitate meaningful play at the locations the game involves, we need to understand LBGs and their structure. In addition, this involves how LBGs relate to spatiality (including locations). Hence, the second question explored throughout the dissertation is:
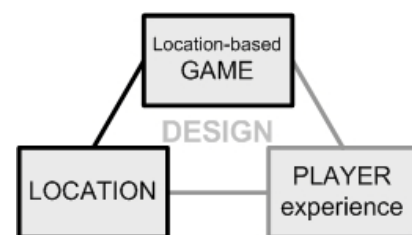
Figure 3: The relation between LBG and location (spatiality).

How can we conceptualize LBGs and spatiality in relation to LBGs?

LBGs and spatiality are conceptualized theoretically in Chapter 3. Through a discussion of theory and empirical analysis, a model for conceptualizing LBGs is developed in Chapter 6. This model addresses the relation between play and ordinary, describes the ways LBGs frame content as authentic or fictional, and examines LBGs' use of physical and digital media. It is used to describe the structure that frames the meeting between players and locations.

Players use LBGs to create experiences. To understand LBGs and to qualify design, we need to understand these practices. Thus, the third research question is:

> How does the player create an experience playing an LBG set in the ordinary world?
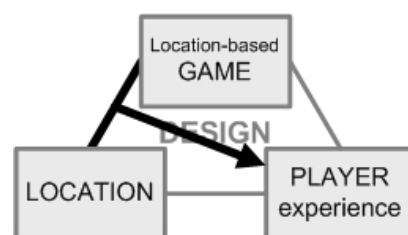
Figure 4: The player's experience is studied in relation to the LBG and location.

The elements of player experience are discussed and developed, in Chapter 3, and it is studied how players use the LBG to create an experience and how players relate to the LBG and to locations. This analysis is presented in Chapter 7.

These inquiries are explored in the dissertation following this structure: In Chapter 2, "Location-based Games: A Research Field," a review of relevant research investigating LBGs is presented. LBGs are presented to provide a context for reading the rest of the dissertation. In addition, a walkthrough of the major types of digital games that expand into everyday space is reviewed. Reviewing the existing literature in the field has two purposes: 1) to introduce the definitions and contributions within the LBG research field, and 2) to enter into dialog with this research. Through this chapter, a list of elements in LBGs is created, which builds up to the next chapter, Chapter 3, "Elements of Location-based Games." This chapter introduces elements central to understanding and designing LBGs. It ends by developing a characterization of LBGs, and thus it is a theoretical approach to answering how LBGs and spatiality can be conceptualized in relation to LBGs. This chapter relates to the second and third research question.

Since the goal is to contribute not only with theoretical findings but also with design knowledge, the dissertation also explores LBGs through design-based research. In Chapter 4,

"Methodology," this methodological approach is introduced and its application discussed. Further, the methods used to study LBGs through design, for conducting focus-group interviews, and observations are presented in this chapter. Design-based research relates to inquiry through design. In this dissertation, the site-specific LBG *Visions of Sara* has been created to learn about both the structures of and the practice of play with LBGs. The background for the design and the design phases are presented in Chapter 5, "Inquiry-based Design." Here, theory is related to practice as it discusses the creation of *Visions of Sara*.

The two next chapters present analyzes that are, respectively, concerned with the structures of LBGs and related practices. Chapter 6, "Location-based Games: Boundaries and Spatiality," analyzes and develops the six dimensions of LBGs and the boundaries between each of them. These dimensions were introduced in Chapters 2 and 3. The dimensions are ordinary, play, authenticity, fiction, physical, and digital. This chapter relates observations and play experiences to the theoretical conceptualization of LBG structures, and thus to the second of the research questions. Chapter 7, "The Location-based Game Experience," on the other hand, explores how players create experiences using LBGs in relation to the spaces in which they are set. This relates to the third of the research questions: How do players create an extraordinary experience playing an LBG set in the ordinary world?

Finally, Chapter 8, "Conclusion," evaluates the contributions of this project, and concludes the study. In this chapter, the findings of the dissertation are related to the first research question concerned with the prerequisites for a meaningful meeting between LBG player and locations.

2 Location-based Games: A Research Field

The purpose of this chapter is to set the scene describing LBGs – how they are defined in the pertinent literature, but also their relationship to previous definitions of digital games expanded into everyday spaces. Throughout this chapter, elements of LBGs are introduced and identified, and will be developed further in Chapter 3.

The research in LBGs relates to research of other new types of games that expand into everyday spaces, namely: pervasive games, ubicomp/ubiquitous games, immersive/alternate reality games (ARGs), hybrid reality games (HRG), and mixed reality games (MRG). Definitions for these types of games are presented in this chapter, in order to situate research on LBGs within the field of (digital) games that expand into everyday space, and show how these concepts are relevant to understanding LBGs, as they are referred to when citing authors throughout the dissertation. Through this presentation LBGs' characteristics are identified.

I open by presenting a selection of LBGs in relation to key concepts of the LBG research, as well as those LBGs played and observed as a part of this research project. This is done to establish the main concepts of LBG research and offer a point of reference for the rest of the dissertation, as these are the games used as examples and for analysis; I do not expect all of them to be commonly known.

2.1 Finding Main Themes of Location-based Games

This section presents a selection of LBGs from the emergence of this category until the present. This is by no means an exhaustive list. Ten LBGs have been selected, as they present central themes relevant to this dissertation, they represent different approaches to using locations. These include LBGs designed for specific locations versus those playable anywhere; and LBGs using different types of location-aware technologies and created to serve different purposes – from artistic and political to commercial. The games represent different themes in terms of research, game-play, and fiction. They have all been described and used as cases in the LBG research, and will serve as examples in the theory section. After presenting these ten LBGs, six more are presented that have been observed, played, and analyzed in this study. These are presented here as a point of reference, as they are used as

cases in the analysis. When presenting all of the LBGs, their central elements will be identified and highlighted.

LBGs emerged when technology made it possible to locate devices in physical space. As a result of the development of computing hardware and infrastructures, digital play can be brought into physical space (Nicklas, Pfisterer, & Mitschang, 2001). LBGs can be divided into three different groups, according to Sotamaa (2002, p. 36):

> The oldest games are based on using [GPS] receivers that have been in the market much longer than mobile phones or PDAs [personal digital assistants]. Theoretically the playground of GPS based treasure hunt games like *Geocaching* and *Geodashing* is the entire planet though standard GPS functions only outdoors.
>
> […]
>
> Secondly there are concepts based on local area networks (wlan etc.) and proximity sensors. The experiments produced so far are mainly outcomes of academic and commercial research projects. These games utilize a limited area and can make physical locations, objects, states and locations of other players intrinsic elements of the game.
>
> […]
>
> The third category of LBGs consists of the ones taking advantage of cell identification in GSM networks. GSM network based locating is not as accurate as other alternatives but the advantage is that cell identification does not require any new hardware or additional cards but the games can be played by using standard GSM phones.

Sotamaa's categorization of LBGs relies heavily on the technology used. Although technology is an enabler of LBGs, it is not the types of technology that determine the difference between LBGs. For instance, the LBG *Can You See Me Now?* (*CYSMN*) (presented on page 12) has been moved from one platform to another, largely remaining the same game.[4] Although the media used to create the LBG does influence on the game, it does not serve as a defining feature. What distinguishes LBGs from other games is how they use

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[4] The first versions of *Can You See Me Now?* used a PDA, GPS and walkie-talkies as interfaces. The new versions use a 3G phone, GPS and walkie-talkies.

locations, and since the goal of the dissertation is to develop design knowledge for making use of this potential, the way LBGs use space and localization is used to describe them in this chapter.

Sotamaa mentions *geocaching* as one of the oldest LBGs, and this treasure hunt is the first LBG born in 2000, when the signal that jammed GPS was turned off, so that non-military users could use it for pinpointing a location accurately. Only two days after this occurrence, the coordinates for the first cache (hiding place) were posted on the Internet (Montola et al., 2009). In *geocaching*, players hunt caches (treasures). When a cache is found, players often take a token and exchange it for another, and prove they have been there by signing a log (digital and sometimes physical). Thus, *geocaching* let the player relate to locations through

Figure 5: Traditional midsize cache found at the site. (Courtesy of Geocaching Danmark)

"hide n' seek". This strategy we will see is central in many LBGs: Players find and/or place items at locations. Driven by players and improved technology, *geocaching* continues to evolve (Borries et al., 2007a). In 2011, the number of "geocachers" has reached more than 5 million (Groundspeak, 2000). *Geocaching* is unique in the sense that it is run by players themselves.

Whereas *geocaching* enables a player to hide and seek objects at precise locations, *BotFighters*, one of the first commercial LBGs introduced in the beginning of this millennium (Sotamaa, 2002), is designed around *proximity* between players. It is seen as one of a range of LBGs in which the player's proximity to entities triggers game events. *BotFighters* was launched by the Swedish company *It's Alive* in 2001 and was played in Sweden, Finland, and the United Kingdom. The game-play was for players to locate and destroy other players (their avatars were robots or just 'bots'). Players earned points by destroying bots. Their score was reflected in a high score list. Players built and nurtured their own bots via a web interface. A mobile interface was used to perform the actual street battles. Players chose their targets depending on their own location and the proximity of other players. Game actions were performed via text messages, and GSM network cell identification was used to locate players and their proximity (Sotamaa, 2002). *BotFighters* was not set in a determined space; rather, it was played "in everyday physical environments among groups of people perfectly unaware of

the ongoing fights" (Sotamaa, 2002, p. 38). As a result, Sotamaa argues that traditional definitions of game and play (referring to Caillois and Huizinga) are challenged by LBGs such as *BotFighters*, because the *play-space is not determined* in these LBGs. However, the traditional definitions state that play is separate from real-life actions and often strictly limited in time and place (Sotamaa, 2002). To play *BotFighters*, players had to move around the city, to hide, to find opponents, and stage attacks.

The renowned LBG *CYSMN* actually experiments with this *mobility across digital and physical space*. In 2001, *CYSMN* was co-created by Blast Theory, a British artists' group, and Nottingham University's Mixed Reality Lab. *CYSMN* is designed as a fast-paced chase game. Up to 20 online players were chased across a map of the city by three runners (professional performers) who were running in the actual city streets equipped with a handheld computer,
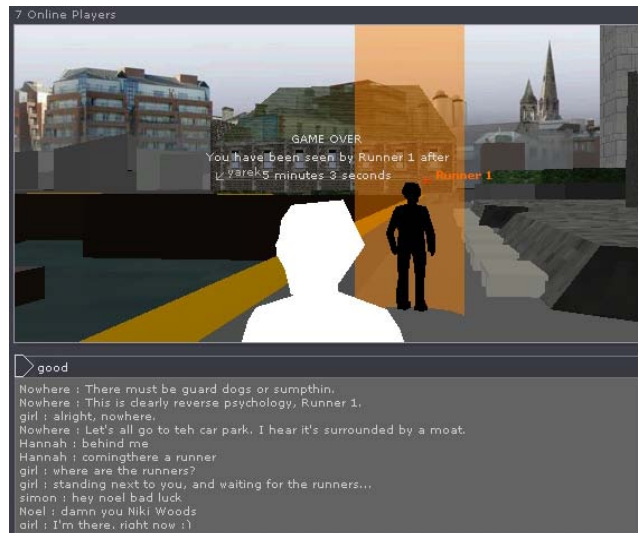
Figure 7: The online player's interface when moving. The player is represented by the white shape, the runner by the black. (Courtesy of Ian Alden Russell and Blast Theory)

GPS receivers, walkie-talkies, and digital cameras (Flintham et al., 2003). In *CYSMN*, players are again relating to locations based on proximity of players; however, in this example, the primary play-space in which players act is in both digital and physical space and *players are not necessarily in the same space*. In addition, particularly for this game, the *topography* of the

Figure 6: A runner in CYSMN trying to catch the 'invisible' online players. (Copyright, Blast Theory)

environment in which the LBG is played affects the player experience. The experience is affected by variable conditions such as whether during the chase, runners must run uphill or wait for a green light at a pedestrian zone. Researchers observed that even though the hunted online players did not know the runners' exact context, due to the

lack of GPS accuracy, they found a way to learn about it: The *context* of the runners was revealed by listening to the conversation between runners, which was made audible to online players (Flintham et al., 2003). Phrases such as "I'm waiting for a Green Man" from a runner revealed that the person was waiting at a pedestrian crossing, meaning that online players had a chance to escape (Flintham et al., 2003). Runners found a way to exploit GPS inaccuracy as a part of their game-play. They lured online players into zones with high accuracy and ambushed them. Since online players were unaware of the level of GPS accuracy, they could not use it in their tactics. Flintham et al. (2003) argue that players should have been made more aware of the inaccuracy through the design. The researchers consider when to use *uncertainty* as a part of a design strategy:

> Your strategy – whether to hide or reveal uncertainty – will depend on the participants and their task. Tasks that involve maintaining engagement with a compelling experience – games and art, for example – should seek to hide uncertainty. More work-oriented tasks that involve making important decisions based on uncertain information should seek to reveal it. Tasks that involve both, such as *CYSMN*, where the runners work to create an experience for the online players, can adopt both strategies simultaneously. (Benford et al., 2003, p. 40)

The developers, Blast Theory and the Mixed Reality Lab, carried these ideas from *CYSMN* into *Uncle Roy All Around You* (*URAAY*), in regards to handling uncertainty. Whereas *CYSMN* divides competing players into separate spaces, *URAAY* (2003) places players that cooperate on-street and online, respectively. The game revolves around finding a mysterious person – Uncle Roy – and on-street players are encouraged

Figure 8: Online players get messages from Uncle Roy and communicate with on-street players. Online players navigate a 3D world. (Copyright, Blast Theory)

to use *locations as scenes of performance* acting out the game. In addition, the *atmosphere/authenticity of specific locations* is used as, e.g., when on-street players step into Uncle Roy's fabricated office. On-street players are equipped with a PDA and are in contact with online players through text/audio messages. Online players can track on-street players' movements across

the city and can help or hinder them in reaching their goals (Benford et al., 2006). The setting involves conspiracy, isolation, and surveillance to enhance tension and questions "the boundaries of where the game ends and the everyday world begins" (Benford et al., 2006, p. 429). For instance, street players must leave behind their personal belongings (watches, phones, maps, etc.) and are told that they are being watched. In *URAAY*, design strategies handling uncertainty are employed, so that both on-street players and online players must interpret uncertain information as a part of the game-play. Uncertainty is increased by *blurring the boundaries between the digital and the physical, the fictional and the real* involving ambiguous text clues, bystanders, physical props, and live actors. The authors suggest two design strategies in this relation: 1) the *apparent frame* is smaller than the *actual frame*, as bystanders are drawn into the game (Benford et al., 2006). For instance, street players are encouraged to follow a person with a certain feature (e.g., wearing a white tee-shirt). Because players do not know

what (and who) may be part of the game, the game's frame is unclear. 2) the apparent frame can be larger than the actual frame, implying that controlled content (props and performers), such as Uncle Roy's office or the limo and driver who picks up players at the end of the game, are a part of the surrounding world (Benford et al., 2006). This play with frames causes *ambiguity*, which can be exploited in the LBG design, as demonstrated with *URAAY*.

Figure 9: *URAAY* on-street players invited into a limo at the end of the game. (Copyright, Blast Theory)

In *URAAY*, the ambiguity is created through the play with frames, while in *CYSMN* the main source of uncertainty was GPS accuracy (Flintham et al., 2003). If designers cannot avoid this type of technological bias, they can hide it not to disrupt participants, or reveal the uncertainties so that participants can work with it (Benford et al., 2003). Revealing uncertainty and even increasing it are strategies explored in *URAAY* and *CYSMN*. Instead of a seamless implementation of technology into everyday environments, designers choose **seamful design**, which reveals the accuracy of information provided by technologies, e.g., by showing mobile phones' signal strength (Chalmers, MacColl, & Bell, 2003). Continuing this approach, in 2005, two LBGs that allowed players to explore "seams" of networks were designed: *Treasure* (Barkhuus et al., 2005; Chalmers et al., 2005) and *Feeding Yoshi* (Bell et al., 2006). Both games were built around uncertainty related to location and network connectivity and aimed at showing the "seams." A seam is

a break, gap, or "loss in translation" in a number of tools or media, designed for use together as a uniformly and unproblematically experienced whole. Seams often appear when we use different digital systems together, or use a digital system along with the other older media that make up our everyday environment. (Barkhuus et al., 2005, p. 359)

In *Treasure* and *Feeding Yoshi*, players explore the seams between wireless networks and mobile phones. In *Treasure*, players collect digital "coins" shown on the screen of their phones from outside of the wireless network, which is also indicated on the map of the phone, and gain points as they bring them back into network range and upload them (Chalmers et al., 2005). Players have to map the wireless networks through play. Players can steal coins from each other, and they can cooperate in groups. In *Feeding Yoshi*, players collect fruit from plantations situated at open

Figure 10: Feeding Yoshi
(Courtesy of Matthew Chalmers)

wireless access points and feed fruit to the animals – Yoshis – that crave it, which are situated at secured wireless access points (Bell et al., 2006). Using seamful design as an approach, the *infrastructure* (here, a wireless network) of a city becomes part of the LBG's game-play and the focus of the player's attention.

An awareness of hidden infrastructure is also central to the game-play of *CitySneak* (2005); however, here, it is surveillance cameras' infrastructure toward which players' attention is drawn. Like *URAAY*, the theme of surveillance is central in *CitySneak*, which is "a location-based HRG that explores the surveillance of urban areas through the adaptation of existing mobile technologies" (Sweeny & Patton, 2009, p. 204). In the first part of the game, players plot the lived environment in terms of surveillance cameras, and in the second part, the players sneak around them carrying a GPS unit. Players score points depending on the time it took and the number of surveillance cameras they encountered (Sweeny & Patton, 2009). The game aims to teach by encouraging players to consider the effects of surveillance within our lived environment, resulting in "*active public pedagogy*" (Sweeny & Patton, 2009, p. 213).

Another LBG with a learning purpose is *Frequency 1550*, published in 2005. In this LBG, players learn about the city of Amsterdam in 1550. The game is played by school children in

separate groups: one part of the group moves throughout the streets and the other part remains at headquarters at the Waag building, one of the city's medieval city gates. In *Frequency 1550*, everyone is a player; none is a performer, as in *CYSMN*, a game that also separates players from one another. Whereas *CitySneak* relates learning to a modern living environment, *Frequency 1550* uses an *authentic location to contextualize a topic*, in this case the history of Amsterdam. Locations are used as a "setting" – due to their atmosphere and the objects there to enhance the LBG's storyline. The backdrop story of *Frequency 1550* is that the universal mobile telecommunication system network faces interference from a different period: the medieval era. *Frequency 1550* uses *double mapping*, as players navigate a map of Amsterdam circa 1550 for use in moving throughout present-day Amsterdam (Admiraal, Akkerman, Huizenga, & Zeijts, 2009; Waag Society). Players look for a holy relic in return for citizenship, and online and street players cooperate to achieve this goal. Street players are equipped with a phone that has an internal GPS receiver and cameras. They explore different sites in the city and create street performances, e.g., pretending to be fishermen, and document this performance themselves. Thus, players translate their performance into something that the game system can understand – *players interface* with their performance. Street players can also place booby-traps toward which other teams will want to avoid drawing too near.

The LBG *REXplorer* (2007) also invites players to explore the history of a specific location. Here, the location is the German town Regensburg. The LBG is part of the Regensburg Experience (REX) Museum that extends the visitor experience beyond the museum's walls (Ballagas et al., 2007). Knowledge presented at the museum is contextualized in authentic locations through the LBG. Players embark on a journey into town equipped with a rented device composed of a mobile phone and a GPS receiver in a custom-designed shell named "paranormal activity detector" (Walz & Ballagas, 2007). Players can get in contact with "spirits" from other eras through this device; and making gestures with it, they can also perform "magic" (Ballagas et al., 2007; Walz & Ballagas, 2007). *REXplorer* stands out from the rest of the LBGs presented here with this feature of the *interface supporting gestures*.

The LBG *CatchBob!* (2007) is also pedagogic. The goal of this LBG is to inquire about *the influence of location-awareness on collaboration practices* (Nova & Girardin, 2009). The game-play of *CatchBob!* relates to conquering space. As such, it is similar to *CYSMN* and *BotFighters*. However, this game is linked to cooperation through locative-media rather than elimination.

Players are divided into groups of three, each of them equipped with a tablet PC. They cooperate to find the digital object "Bob". When it is found, players need to "surround" it creating a triangle with certain proximity of each side to the digital object "Bob" made out by the position of each of the team members. Each team has 30 minutes to accomplish this task. To promote alternative ways of cooperating, audio communication between team members during the game is not permitted by the system. Players cooperate by writing messages to each other on their tablets.

These ten LBGs present different ways of using locations, different (research) goals, and technological setups. These will be listed after presenting the LBGs observed and played as part of this dissertation.

2.2   The Location-based Games Played

The six newest LBGs presented here are those observed, played, and analyzed during the study. These have been chosen since they have themes that overlap with the LBGs presented in the previous section as well as new themes. They are presented here as a point of reference and are discussed more thoroughly in the analysis.

Land of Possibilities?[5] (2007) is a commercial LBG that uses smart phones with embedded GPS technology. This game is located at the *Open Air Museum* (*Frilandsmuseet*) in Brede, Denmark. The museum has more than 50 farms, houses, and mills displaying different building styles from the last 300 years from different regions in Denmark (Nationalmuseet, 2011). The game is targeted at educational use. Normally, a class will book a game session with an instructor in advance and then go to play. As a group, players choose a character and play a young man or woman living at the end of the 19th century who wishes to go to the United States. Players move around on the museum's grounds looking for non-playing characters (NPCs) who can help in this emigration process. The game-play is based on finding these NPCs, marked as a blue dot on a map on the player's phone-screen, as well as on figuring out the game's narrative. The atmosphere of the location with its authentic buildings is sometimes used in the story.

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[5] In Danish: *Mulighedernes Land?*

Whereas *Land of Possibilities?* is played at a specific location, *Fruit Farmer* (2008), developed by *LocoMatrix* (2007), is a commercial, arcade-style location-based maze-game that can be played anywhere and as such is not location specific. What makes the game location-based is that the player must move through physical space to move his/her position in the maze on the screen. The possibility of acting in physical space is literally added to representational space. Digital space is thus expanded into physical space, and players are

Figure 11: Screen shot from *Fruit Farmer.*

moving in digital and physical space at the same time. In digital space of their smart phone's screen, they encounter digital representations of wasps, fruit, and a barn. The objective of the game is to collect fruit without being stung by wasps and then reach the safety of the barn. The game can be played individually or in a group of up to eight players, each equipped with a phone that runs the game software. Whereas players in *CYSMN* and *BotFighters* compete without seeing each other, and players in *CatchBob!* cooperating by being in physical space but are separated by distance, players in *Fruit Farmer* compete in clear sight of one another. *Fruit Farmer* can be played outdoors wherever the player pleases, as the game uses *adaptation* to adjust game-space to the physical space in which the player is situated.

Figure 12: Ghost Patrol: A ghost is within range.

Ghost Patrol also adapts digital content to the proximity of the player. It is a commercial game available on the *GPS Mission* platform that allows users to create games, making action spots at defined locations. In *Ghost Patrol*, digital ghosts move around a map on the mobile device's screen. *Ghost Patrol* lets the player control the representation of an aim on the screen with his/her physical movements and thus the player merges physical and digital space through the movements. Players are supposed to eliminate ghosts – i.e., if the players have strong enough weapons. Players can choose to either hunt the ghosts or flee by moving in physical space. During the game, players get points for defeating ghosts and with these points they can buy new and better weaponry. When I played the game, suddenly a "pop up" message informed me that a player had tossed a sausage at me from Germany. I chose to pass on the sausage and tossed it at a player in Finland. This

was apparently part of a food fight on the platform, which had nothing to do with defeating ghosts.

In *Spy in the City*, players are not fighting ghosts but terrorists. Like *REXplorer*, *Spy in the City* (2009) is part of an exhibition, in this case at the Spy Museum in Washington, D.C. It is played on the streets of the city and, as in
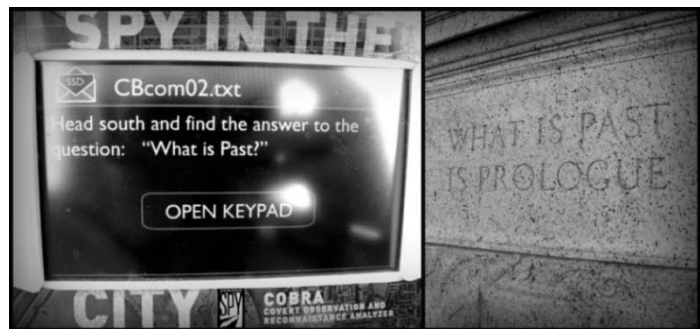
Figure 13: A task in *Spy in the City*.

REXplorer, players are equipped with a unit specially designed for the game: the GPS Ranger. This device encompasses a video player, stereo speakers, and GPS unit. Players are agents on a mission to save Washington, D.C. from a terrorist attack. The game has players cooperating with a "mole" who has left messages for them at different specific locations in the streets around the *Spy Museum* located in the center of the city. *Spy in the City* connects the facts presented at the museum with a story based on *authentic cases* from the U.S. Federal Bureau of Investigation's archive and *authentic ways* of concealing and breaking codes. In this LBG, we find examples of feigned use of the interface: Players are asked to scan for finger prints and hidden messages, although the device cannot support this. This can make the game seem larger than it is, and the *interactions seem authentic*, provided that the players do not detect that the interaction is feigned.

Like *Spy in the City*, the LBG *Visions of Sara* (2009) is based on specific locations. This LBG is created as a part of this dissertation. It is situated in Odense, Denmark and is based on a ghost story in which the players are "ghost-busters" trying to solve a riddle that has its origin in the Middle Ages. The game involves ghosts, mysteries, riddles, and murder and is played by groups of two, in which players switch between the headquarters (HQ) at *Odense Centralbibliotek* (library) and the streets. Like *CYSMN*, *URAAY*, and *Frequency 1550*, players are separated into online players (base agents) and on-street players (field agents). It has been a goal to create specific roles for both types of players, so everyone can contribute to the game's outcome and to avoid having players who do little more than look at a device's screen while playing in the streets of the city, allowing them to focus on and sensing their environment while being there. Street players are equipped with a GPS unit, a phone, and a folder. HQ players have access to the library, the Internet, and an interface presenting tasks

and the location of the street players as well as points of interest. The main focus for *Visions of Sara* is to provide players with different approaches to acting in space in order to explore how players create meaning in an LBG.

Figure 14: Three screens from Foursquare: Check-in history, checking in at a venue, and badges earned.

The newest LBG in this survey of LBGs is *Foursquare*, which is a commercial web and mobile application that players use to "check-in" at locations. Players can create and post tips about various real venues. As a bonus, players receive badges for different accomplishments, such as the super-star badge awarded to players who have checked in at 50 venues. The player who has checked in at a venue more than everybody else on several days is crowned mayor of that particular venue. Every time a player checks in somewhere, he/she can see who is mayor at that location. Every time a player checks in, he/she receives points: e.g., five points for becoming the mayor, three points for the first check-in at the location, and afterwards, one point per check-in, etc. There is a high score for all players in an area, and the score of the one who has earned the most points checking in the current week is displayed. This high score is reset every Sunday. Players can also connect to other players, see where their friends have been, and share their activity on *Twitter* and *Facebook* with their friends. In *Foursquare*, players connect the game to their ordinary world and their *real-life actions*. Players are not experiencing a story through the game; instead, they are *creating places* and *stories* with their playing. The LBG allow them to *leave traces at location and expand their reach*, being able to follow other players' movements. Players *map, share, and conquer* mayorships (*locations*) in this social game.

An LBG can be categorized by how the game interfaces with and frames locations, objects, events, and actions. Different types of relations between players, LBG and locations as play-spaces have appeared through the LBGs presented.[6] These are:

- *"Hide n' seek"*: Players need to find, hide, or avoid specific locations
- *Proximity*: Players experience how proximity to entities triggers game events
- *Atmosphere/authenticity*: Players experience locations used as a "stage" or a setting for the game due to their atmosphere
- *Infrastructure*: Players explore the infrastructure of locations
- *Scene of performance*: Players appropriate locations as scenes of performance, at which they can play and act out the game
- *Topography*: Players experience how the spatial features of the locations at which they play affect the game experience
- *Merging spaces*: Players experience that the primary play-space (where players act/move) is in both digital and physical space
- *Leave traces and expand reach*: Players experience that they can leave and access information through the LBG that would normally not be accessible.

The presented games are all categorized as LBGs, since the outcome of the games depends on the location of players. LBGs are games

> whose outcome depends not only on the events on the screen but also on the player's position in the physical world. [LBGs] involve the player's interactions with particular locations as part of the game, so it actually matters where the player physically is. (de Lange, 2009, p. 56)

The LBGs use the same types of technologies, yet still their relations to locations are quite different. The LBGs also present different topics in relation to defining LBGs. These are highlighted in the text as well and repeated here to provide an overview: Play space in LBGs is not determined. The primary play-space in which players act is in both digital and physical space, and players are not always in the same space. Players are mobile, moving between or in locations. Player experience can be affected by both the topography and infrastructure of

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[6] I have presented these during the presentation. For an overview of all the games and their relations, please see Table 5 and Table 6 in the Appendix.

the environment in which the LBG is played. Players learn about the context through interaction. As LBGs have seams, and as the limits of play space are undetermined, LBGs are related to uncertainty. This uncertainty can be purposefully manipulated by blurring the boundaries between the digital and the physical, the fictional and the authentic to increase the excitement level of the LBG. Blurring the boundaries is concerned with framing the play situation. Seamful design addresses how to handle ambiguity in relation to technology. The interface of LBGs can support gestures, and players can also interface with their surroundings. In addition, LBGs can adapt digital content to physical surroundings. The interface also relates to how players socialize across space. Finally, we have seen with these LBGs that players create meaning and locations.

The LBG presented in this Chapter have been categorized differently. For instance, *CYSMN* has been categorized as a HRG (de Souza e Silva & Sutko, 2009), as smart street sports, that requires both physical exercise and tactical thinking (Montola et al., 2009), and as a mobile MRG by its makers (Flintham et al., 2003). Let us have a closer look at how categories of game expanded into everyday spaces are defined, placing LBGs in the landscape.

2.3   Digital Games Expanded into Everyday Spaces

Many terms are used to describe digital games set in physical space. These terms are not synonymous, as they cover different types of games, and sometimes the same game is categorized differently by different scholars. In this section, the dissertation is placed in the landscape of games that expand themselves into everyday spaces. This is done to conceptualize LBGs, to show how they are connected to development and theories in other areas, and the ways in which they stand apart. Thus, a walkthrough of these types of games and the main concepts defining them leads to characterizing LBGs. The categories presented are: pervasive games, ubicomp and ubiquitous games, HRG and MRGs. These have been chosen as they appear in the theories used in Chapter 3, and they have been used about some of the games presented in the two previous sections.

2.3.1   Pervasive Games

The first academic citation of the term "pervasive games" occurred in 2001 (Nieuwdorp, 2007), but the idea was born in the late 1980s. The term *pervasive games* (and *ubiquitous games*) originates with the development of ubiquitous computing, which started as an alternative to

the idea of "virtual reality," i.e., a convergence of computation. Instead, ubiquitous computing is about distributing computation into the space of bodily presence – into our everyday spaces (Weiser, 1991; Weiser, Gold, & Brown, 1999).

Nieuwdorp believes that pervasive gaming originates from technological research (Nieuwdorp, 2007). One of the early examples of pervasive games as part of technological research was a paper on the pervasive game *Pervasive Clue*, developed as a test bed for exploring sociality and different types of game-play. In the paper, a pervasive game was defined as

> a LARP game that is augmented with computing and communication technology in a way that combines the physical and digital space together. In a Pervasive Game, the technology is not the focus of the game but rather the technology supports the game. Although technology is ubiquitous in a Pervasive Game, its role is a supporting one and thus the technology is kept as unobtrusive as possible. (Schneider & Kortuem, 2001, p.2)

According to Schneider and Kortuem, pervasive games are LARP games enhanced with technology that combines physical and digital space. Schneider and Kortuem stress that they focus on the game experience not the technology. Technology merely makes the game possible, according to the authors.

As we can see, pervasive games are claimed to originate from technological development, and one of the first definitions of the concept includes technology as the enabler of these games. However, taking technology as a point of departure is rejected by several scholars. Among them is found the much cited book *Pervasive Games: Theory and Design* (Montola et al., 2009) that cites Montola's (2005) definition of pervasive games. Huizinga's theory on play is taken as a starting point instead, in order to explain how pervasive games differ from other kinds of games (Montola, 2005). Montola refers to Huizinga's concept of the "magic circle," a metaphorical device used to describe the characteristics of play. According to Huizinga (1993), when playing, rules *separate* the play world from the ordinary world, and when players accept the rules, they enter a separate space. This space can be referred to as a magic circle (Salen & Zimmerman, 2004), an area of temporary activity the player enters that has its own rules. In Huizinga's definition, players must agree that certain actions at certain places in a

certain time are addressed with a playful approach (Huizinga, 1993). Montola et al. argues that pervasive games differ from traditional games, because the players in pervasive games systematically blur and break these traditional boundaries of the game: "[A] pervasive game is a game that has one or more salient features that expand the contractual magic circle of play socially, spatially, or temporally" (Montola, 2005, p.3; Montola et al., 2009, p.12).

Spatially expanded games are all about discovery and changing perception (Montola et al., 2009). The *location* of the game is uncertain and thus the players never know *where* they will encounter game content. A game is only spatially expanded if the play-space is uncertain, and if the game is affected by the spatial context of the player. A pervasive game can expand temporally by interlacing the game into "everyday life." The *duration* of the game is uncertain; thus, the players never know *when* they will meet the game. Finally, social expansion is connected to the above two expansions. Social expansion is concerned with "playership": Who is and is not part of the game?

Being expanded in at least one of the three ways described pervasive games do not explicitly limit themselves as separate from their surroundings. Players are not necessarily aware what is and is not part of a game, and pervasive games exploit this ambiguity (Montola, 2005).

Pervasive games need not involve technology, because expansions are possible without using technology (Montola, 2005; Montola et al., 2009). *Killer* is an example of a pervasive game that is not based on technology (Montola et al., 2009), a game in which players are both assassins and victims, trying to "kill" each other through stealth, e.g., sneaking up on the person named as a target by the game master and shooting him with a water pistol. Still, Montola acknowledges that some pervasive games do use technology, as they include virtual elements (Montola, 2005).

In contrast, LBGs are always enabled through technology, because the outcome of the game relates to exact locations of players (de Souza e Silva & Sutko, 2009), they use location-aware technologies as interfaces. The authors note the distinct characteristic of LBGs

> is that they use mobile technologies with location-awareness (cellular positioning or [GPS]) as the game interface. Location-awareness allows players to see each other on their cell phone/personal digital assistant (PDA) screen and interact with other

players depending on their relative position in physical space. (de Souza e Silva & Sutko, 2009, p. 4)

LBGs are possible as a result of location-aware technologies. Consequently, as they use technology, LBGs distinguish themselves from pervasive games, according to the definition of Montola et al. (2009). However, Montola's definition of pervasive games has been used as a point of reference when defining LBGs (de Lange, 2009; de Souza e Silva & Sutko, 2009), since *LBGs are spatially expanded*: Play-space is uncertain. Since players of LBGs are playing in everyday spaces where the boundaries of the game are not exact, *uncertainty, blurring boundaries*, and *ambiguity* is apparent in LBGs as well, as we have seen (Bell et al., 2006; Benford et al., 2003; Benford et al., 2006; Gaver, Beaver, & Benford, 2003). LBGs dependent on the social context of the player (Benford et al., 2003); i.e., playing *Treasure* in a quiet park is a whole different experience than playing the game on a busy square. With regard to temporal and social expansions, they can be observed in LBGs, although they are not a defining feature (Diamantaki, Rizopoulos, Charitos, & Tsianos, 2009). An example of temporal expansion can be observed with *Feeding Yoshi*, in which players nurture Yoshi and plantations on their own time. Social expansions can also be present in LBGs. Examples are making use of performers to play roles in the game, such as in *URAAY*. Further, some LBGs refer to bystanders in a way that involves them, or leaves the players in the dark about who they are playing against so that the game expands socially (e.g., *URAAY*, and *BotFighters*). Players can also involve bystanders, e.g., if they are "in the way," and they could be helpful or some other similar role.

Whereas the definitions of pervasive games above relate to the way play is framed and by the use of media, McGonigal (2003a, 2003b, 2006, 2007b) defines pervasive, ubicomp, and ubiquitous games in relation to their use of space, purpose, and influence on player experiences. Let us have a look at these and relate them to LBGs.

2.3.2 Ubicomp and Ubiquitous Games
Ubiquitous games are based on ubiquitous computing (or ubicomp) that "seeks to augment everyday objects and physical environments with invisible and networked computing functionality" (McGonigal, 2007a, p. 233). In this respect, LBGs and ubicomp/ubiquitous

games are not different, since LBGs are also played in physical environments augmented by computing. However, LBGs do not have to augment everyday objects through computation.

McGonigal has suggested three categories of "ubiquitous play and performance," linking these types of games to their purpose. The three categories are

> *ubicomp games*, research prototypes that advance the scientific agenda of ubiquitous computing through game design; *pervasive games*, performance-based interventions that use game imagery to disrupt the normative conventions of public spaces and private technologies; and *ubiquitous games*, commercial entertainment projects that replicate the interactive affordances of video and computer games in the real world. (McGonigal, 2006, pp. 1-2)

In McGonigal's terms, technical development is now found in the category *ubicomp* games. *Pervasive* games pervade physical space, they have an agenda, and they are more show than function. *Ubiquitous* games are massive and persistent (see Figure 15).
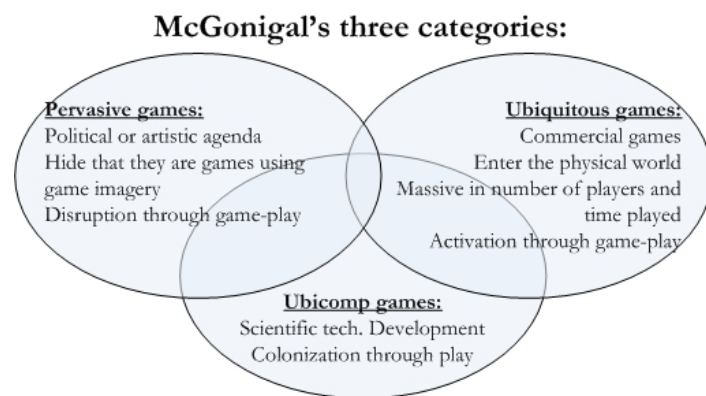
Figure 15: McGonigal's three categories of ubiquitous play and performance.

In the definition above, ubicomp games are linked to scientific technological development. McGonigal uses *CYSMN* as an example of this, since the game is created to study context in relation to mobile applications, GPS, audio, and games (Flintham et al., 2003). A metaphor for the work of these games in society is *colonization through game-play* (McGonigal, 2007a) as these games allow players to take possession of the everyday world through the use of new technologies. Players of LBGs can relate to space through appropriation, since players can turn everyday spaces into play-spaces, and even more directly, game-play can relate to conquering certain locations, as is the case with *CitySneak*. This idea is developed further through the dissertation (cf. Chapters 3 and 7).

McGonigal understands ubiquitous games as commercial games that enter the physical world: they involve players by the hundreds or thousands, and they are played for long

periods of time without stopping (McGonigal, 2006). She uses *I Love Bees* as an example of a ubiquitous game. This game was created as a promotion of the Xbox game *Halo 2*, it was deployed via cross media through emails, blogs, websites, and trailers, and played by thousands of people (McGonigal, 2006). The metaphor for the work of ubiquitous games in society is *activation through game-play* (McGonigal, 2007a). Ubiquitous gaming activates players, as it

> asks players to take up two core mechanics: first, searching for and experimenting with the hidden affordance of everyday objects and places; and second, exhaustively to activate everything in their immediate environment. (McGonigal, 2007a, p. 236)

Ubiquitous gaming is enchanting everyday life through these mechanics. The ubiquitous game empowers players, so that they change their perception of the surroundings, as well as altering the interaction patterns of everyday life (McGonigal, 2006). Game-play of ubiquitous games is related to finding game affordances in everyday spaces, i.e., the perceivable properties, sensory and cultural, cues that help players to understand how to interact with elements. However in ubiquitous games these affordances may well be hiding under the surface, for players to find (McGonigal, 2007a). Since LBGs are set in everyday spaces, if they use this design strategy, they can empower players and affect their experience of everyday spaces, e.g., as *Frequency 1550* does by guiding attention toward and contextualizing the history of Amsterdam.

A large subgenre of ubiquitous games is ARGs or immersive games.[7] These games are designed to blur the boundaries of play to the extreme: They claim not to be games. McGonigal (2003a) writes that games that pretend they are not games use "this is not a game" rhetoric to convey their message. Benford et al. (2006) suggests playing with the relationship between apparent and actual frames of play. These games take this one step further as they seek to erase the apparent frame that divides game from everyday life (McGonigal, 2003a). When defining the boundary between play and reality, McGonigal uses the word "permeability," which refers to the flow of material that passes through a boundary, in this case, how much of the game "flows into reality" or "pervades reality" (McGonigal, 2003a).

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[7] McGonigal (2006) started using the term immersive games and later alternated between this and ARGs.

The game categories presented all relate differently to the use of media and spaces: Pervasive games expand play spatially, temporally, and socially; ubicomp and ubiquitous games have emerged out of technological development; ARGs blur boundaries between play and ordinary. However, pervasive games and ARGs are not always set in digital *and* physical space. The last three types of games are characterized by being played not only in digital space but by encompassing physical space as well.

2.3.3 Hybrid Reality and Mixed Reality Games

Two approaches to the relation between digital and physical space in games are represented by HRGs and MRGs. Whereas pervasive games do not have to use technology, and immersive and ARGs do not necessarily need to use physical space, HRGs and MRGs depend on it.

HRGs do not have a primary play space. They are played concurrently in physical, digital, or represented space (de Souza e Silva & Sutko, 2009). We have already seen this split between spaces in, e.g., *Treasure*, in which players move in physical and digital space simultaneously. HRGs are played by multiple players with cell phones equipped with location-aware technology and connected to the Internet. HRGs are examples of networked communities brought into "hybrid spaces [that] are mobile spaces, created by the constant movement of users who carry portable devices continuously connected to the Internet, and to other users" (de Souza e Silva, 2006, p. 262).

HRGs do not separate digital and physical spaces; rather, they are set in hybrid space in which a user's connection to the space he inhabits is strengthened as the connection depends on the user's relative position in space (de Souza e Silva, 2006). HRGs are designed so that the player does not experience physical and digital space as separate. They flow together.

MRGs, on the other hand, are playing on the opposition between these spaces isolating a player in either space, but playing together. The term MRG is used to describe *CYSMN* and *URAAY*, created by researchers at the Mixed Reality Lab of Nottingham University together with Blast Theory, among others. MRGs use positioning technology to place digital content at specific locations in the real world, augment the physical world with an overlay of digital content via a mobile device (Montola et al., 2009), and separate players in physical and digital spaces (Flintham et al., 2003; Montola et al., 2009).

HRGs and MRGs are sub-categories of LBGs as their game-play depend on locations too, and they mix digital and physical media. The difference between them is the understanding of the relation between digital and physical spaces reflected in the design of games set in both digital and physical spaces. The conceptualization of the relationship between physical and digital spaces affects the game design (this is discussed further in Section 3.1.3).

Researchers from Mixed Reality Lab sum up the characteristics of the experience playing these new types of games set in everyday spaces. These

> new kinds of experience, variously known as pervasive, mobile, alternate, or mixed reality games are emerging to exploit the exciting possibilities of interacting in public places. A unique feature of these experiences is the way in which they juxtapose the fictional world of a digital game with the physical world that surrounds the player, encouraging participants to explore the relationships between the real and the virtual, drawing on the fabric of the everyday world as material to enhance the digital experience, and exploiting the frisson of carrying out "secret" interactions in public. (Benford et al., 2006, p. 427)

According to the quotation, there are similarities between the types of games we have described here: These games are set in public places and draw on the material of the everyday world. According to the authors, these games allow players to explore boundaries between real and virtual. However, it make no sense to distinguish between real and virtual, as done by the authors, since virtual objects can be as real as physical. Instead, LBGs explore boundaries related to physical and digital media; framing elements as fictional or authentic, and shift between play and ordinary in relation to meaning and motivation.

In sum, 16 LBGs, and theories on LBGs have been presented and related to other strands of research on games expanded into everyday spaces. Through this discussion, elements of LBGs have been identified. It is now time to clarify what characterizes LBGs.

2.4 Characteristics of Location-based Games

In 2003, Benford et al. defined LBGs, emphasizing the setting in which the games are played, the technology used, and the dependency of location. LBGs,

a new form of entertainment, take place on the city streets. Players equipped with hand-held or wearable interfaces move through the city. Sensors capture information about the players' current context, which the game uses to deliver an experience that changes according to their locations, actions, and, potentially, feelings. (Benford et al., 2003, p. 34)

Here, the authors stress the significance of *location-aware technology* and include the *context* of the player in the LBG. The context encompasses locations, actions, and feelings (i.e., the players too). The locations of players are part of the game-play, and the outcome of LBGs depends on the *exact* location of players (de Lange, 2009; de Souza e Silva & Sutko, 2009). Although, technology should not be used to define an LBG - certain type of games afford appropriate technological solutions (Walz, 2010).

According to Nicklas et al. (2001), LBGs can depend on location *information* at different levels: The LBG can respond to a) proximity of other players, b) geographical positions, or c) generic categories (geographical information system (GIS) data). As demonstrated, presenting the 16 LBGs it is fruitful to explore how LBGs use and let players interact differently with locations. The *relations* between location and LBGs listed in this Chapter are: "Hide n' Seek", proximity, atmosphere/authenticity, infrastructure, scene of performance, topography, merging spaces, and leaving traces and expanding reach (cf. p. 21).

In LBGs *play-space is not determined*. Players need to explore where the game is played by acting in both digital and physical spaces. *Movement* is a significant feature of LBGs (Benford et al., 2003; Nicklas et al., 2001). One cannot play an LBG staying at one location; game-related actions must be performed at different locations during the game. This feature excludes physical games such as Nintendo Wii games and Xbox Kinect games that tie players to one location: in front of a stationary screen. In addition, this distinguishes LBGs from ARGs, in which players need not move in physical space. This movement is affected by the design of the LBG: players move according to the goals and rules of the LBG. In LBGs, *rules are not necessarily upheld by the computer*, as the rules apply to both physical and digital environments (Diamantaki et al., 2009). This means that in LBGs, rules are partly negotiated by players. The design of the LBG needs to deal with this aspect, and this dissertation offers a further exploration concerning the ways we can design and conceptualize rules in such games.

Since LBG players move in everyday spaces boundaries of these game are not exact, *uncertainty*, *blurring boundaries*, and *ambiguity* are elements of LBGs too. Further, due to the instability of location-aware technology LBG design have to deal with the uncertainty related to the *seams* between systems used. Also LBGs do not only rely on traditional technical interfaces, players can interface between the LBG and locations too (we return to this in Section 3.3.2)

Being situated in physical environments, an LBG provides players with a framework to produce *meaning*, as it allows the player to transform physical space into a platform for interaction (Gordon, 2009). LBGs affect our experience of the surroundings. Via the games, cities become programmable (Borries, Walz, & Böttger, 2007b), through the frameworks or "patterns" the LBG lets us experience. These patterns are explored further throughout the rest of the dissertation.

Finally, LBGs alter cities, as they change social interaction that enables groups of people to meet up and organize everywhere (Borries et al., 2007b). Thus, every square or park can be a scene for performance, e.g., for players equipped with *Treasure*. However, LBGs are only accessible to those who have the right technology and who know about their existence. They can be quite exclusive in this sense (Xiong, Ratan, & Williams, 2009).

As we have seen throughout this chapter, LBGs can be characterized by their relation to locations (spatiality), the way they structure movement and interpretation through rules and frames (structure), by the technology they build on (interface), and from the player's perspective (player experience). To help us conceptualize LBGs, we will discuss the following elements throughout the next chapter:

> **Spatiality:** in relation to the relationship between *space and place*; the understanding of *digital space*, *mediated spaces*, and physical *locations as play-spaces*.
>
> **Structure:** In LBGs, *rules* are not held by the computer, and but need to be negotiated by players. But it is not only the rules that are uncertain; LBGs also can be designed to present ambiguous information and framing. Content is *framed* as *fictional* or *authentic*, and the framing often is *ambiguous*.
>
> **Interface:** LBGs use *location-aware devices* to interface between players and game system. Due to the uncertainty connected with this technology, players will

experience the *seams* between system and the actual situation. LBGs can even use *physical objects and players* as interfaces.

Player experience: Players of LBGs shift between being motivated by the process of playing and the progress. *Motivation* has not been touched upon in this chapter, but this dissertation argues that it is an element of the LBG player experience and that it even affects players' relation to spaces. In LBGs, players must move between locations. Thus, *mobility* and *actions* are important elements of LBGs. LBGs are frameworks to produce *meaningful play* in everyday spaces. Since LBGs are games, they can be used to create experiences. However, which concept can be used to describe the LBG experience: *flow*, *immersion*, or *incorporation*? This is discussed in the next chapter.

The understanding of LBGs is developed further throughout the next chapter, in which these elements of LBGs are discussed one by one.

3   Theory: Elements of Location-based Games

LBGs let us relate to spatiality, and the ways we understand spaces. They allow us to relate to our everyday world in new ways, due to the way they are structured. LBGs use location-aware technologies to interface between players and the space they inhabit, and players interface between the game and the ordinary world. By engaging in LBGs and moving around, a player creates an experience. In this chapter, these four main categories of LBGs – space, structure, interface, and player experience – are elaborated and developed.

LBGs are complex systems with many interdependent elements as shown in the previous chapter. Consequently, the chapter covers many concepts, written to conceptualize LBGs but also used in the analysis. Throughout the chapter, the LBGs presented in the former chapter are used to exemplify the discussion of these concepts.

3.1   Spatiality

Games are structured spatially, and it is a main feature of games. Digital games normally constitute an entire world in which the player moving around in performing actions via a representation. Game researcher Aarseth writes that

> the defining element in computer games is spatiality. Computer games are essentially concerned with spatial representation and negotiation, and therefore a classification of computer games can be based on how they represent – or, perhaps, *implement* – space. (Aarseth, 2001, p. 154)

Development of the design of space is central to digital games and to LBGs as well. In LBGs, designers cannot shape spaces to represent what they would like them to be, since they are played in physical space. This means that with LBGs, we need another approach to implementing spaces than that used in digital games. In the presentation of LBGs in Chapter 2, the importance of relating to implementation of spatiality – specifically locations – in LBGs was stressed. This topic is developed further in this section.

LBGs are unique in the way the game-play relates to locations, and the ways in which they combine digital and physical space. The main question in this dissertation is how to create

LBGs that use the possibility of enabling meaningful meetings between players and spatial locations, so that the connection is not coincidental. To understand how to create compelling LBGs, we need to understand how players experience physical space when using these games – how the LBGs affect our understanding of our surroundings and how spatial locations are used as a medium to make LBGs. Further, the understanding of the relation between digital and physical space affects the design of LBGs and is examined as well. Thus, understanding spatiality as a concept is essential. The phenomenon of space and place as such is not explored, but a basis for an understanding of what is going on when players interact with space and place through an LBG is built. In this section, we will first discuss *space and place* through definitions that can help conceptualize LBGs. We will relate to the relationship between space and place as playing LBGs lets players relate to both, and as the distinction between them can be related to LBG design. Next, we discuss the features of *digital space* and code, since digital media are enablers of LBGs. LBGs are not played in digital spaces or in physical space only; they are played in a combination of these – in *mediated spaces*. In the section on mediated spaces, different ways of understanding these are discussed in relation to the design of LBG play-spaces. Finally, an understanding of the material of LBGs, namely *locations as play-spaces* and how these are implemented in LBGs, is developed.

3.1.1 Space and Place

The relation between space and place has been discussed by scholars throughout history. There are many complementary and conflicting definitions. Here, focus is on definitions insofar as they help us understand LBGs. My intention is not to make a rigid distinction between the two terms, as space and place are culturally defined concepts that inform each other. However, it is argued through this section that an analytical distinction of space and place, strategic practices, and tactical practices is relevant to the design of LBGs.

The definitions of space and place change depending on the area of study to which they are applied. The point of departure here is an analysis of space and place in relation to design of computer-supported cooperative work (CSCW) (Dourish, 2006; Harrison & Dourish, 1996). Although LBGs are not related to work, we can draw from CSCW, in which the goal is to develop systems that support, not dictate, tasks performed in everyday settings. In this relation, Dourish even relates CSCW research to LBGs through *CYSMN* and *Treasure* as cases. He argues that an *analytical* distinction between space and place proves fruitful when designing for everyday settings. He writes:

Drawing on the work of a range of architectural and urban theorists, we glossed these two aspects as "space" and "place." Where "space" describes geometrical arrangements that might structure, constrain, and enable certain forms of movement and interaction, "place" denotes the ways in which settings acquire recognizable and persistent social meaning in the course of interaction. The catch-phrase was: "space is the opportunity; place is the (understood) reality." (Dourish, 2006, p. 1)

Here Dourish refers to a paper from 1996 (Harrison & Dourish, 1996), in which the authors distinguish between place created through social practices, and space that seems to exist a priori as a structure. Dourish (2006) modifies this description, claiming that space itself is also a social product – space is created (de Certeau, 1988; Law & Hetherington, 2000). The structures that are spaces have been created for centuries through, e.g., surveying, cartography, nation-building, and in later decades by establishing GIS (Law & Hetherington, 2000). As an example, technology – i.e., ships and navigation – enabled the imperialist expansion that connected Europe to the wider world. As a structure, space offers itself as a means to relate to and represent things. For example, GIS data represent distances and locations between places. In most cases, using a map or a GPS will result in establishing a more direct route between two places. These structures make it possible for us to go from place to place, and in this way, space enables things to be connected (Merleau-Ponty, 2002). GIS is a mathematical grid that covers the earth, enabling things to be connected. Creating and maintaining the structure of space is enabled through the development of technologies and movement (Law & Hetherington, 2000). Thus, LBGs are related to space, since they provide players with structures and allow them to move between places.

If space is created, then who does this and by what means? Space is created by those who have the knowledge and technology to create our maps, the rules that govern our cities, the GIS system, etc. Through strategic spatial practices, those in power "transform the uncertainties of history into readable spaces" (de Certeau, 1988, p. 36). By creating the structures, they make spaces readable (legible), and they instill them with values and legitimacy, e.g., through mapping certain aspects. The structures created are not constant, e.g., we see how maps and landscapes change, although the structures do not change all the time; thus, they can seem constant.

Place, on the other hand, is continuously reshaped through use (de Certeau, 1988; Massey, 1993). When it comes to cities, they are in fact created by these tactical practices – by pedestrians who *move* within the structures of space. By using the city, being possessed and embraced by it, the pedestrians are *doing* the city not *thinking it*, i.e., not planning it (de Certeau, 1988). Space is the planned and consciously created structures, whereas place is created through practice enabled by the structure. These categories describe the relation between structure and practice – one does not exist without the other. In this way, space and place can be seen as *analytical* categories that inform each other. Through this distinction, Dourish relates space (strategic practices) and place (tactical practices) to design and use:

> Strategic practices are the practices of design, whereas tactical practices are the practices of use. To the extent that design is an exercise of power over the forms and functions of technology, de Certeau points out that these take their shape only through the ways in which they are subsequently appropriated. (Dourish, 2006, p. 4)

By creating structures, designers enable opportunities, whereas users chose and actualize some of these. In relation to LBGs, designers create structures that suggest different ways of connecting places – e.g., it is the rules of *Treasure* that structure players' movements between and interaction with places. However, the structure – the rules and interfaces – takes form through players' use of these. Players can choose to accept the rules and trust the information provided by the interface; they choose which opportunities they actualize and which they ignore.

Places are related to practices, i.e., to doing something. Thus, they relate to our bodies and are experienced bodily, regardless of whether the place is physical or digital. In LBGs, players are bodily present in the play-space, which is exploited when, e.g., players in *URAAY* are sent to Uncle Roy's office. What does it mean to be bodily present? Böhme (2007) has categorized the space of bodily presence and related it to representational space. This categorization is interesting in LBGs, since they are found somewhere in between representative and bodily space. According to this categorization, being bodily present means to have access to a place through our senses, participation, and actions. Böhme divides place (in his terms the "space of bodily presence") into three categories (Böhme, 2007):

- *Space of perceptions* encompasses my presence among things. This relates to the way I am outside myself through my perception, and the way things around me articulate my presence.
- *Space of actions* covers the scope of actions and movements for me. This space varies in size, depending on the situation. It can be viewed as a space of possibilities.
- *Space of moods* has a physical span, as it involves me emotionally. This space comprises the mental and emotional tone that pervades the environment around me. It is the atmosphere that suffuses the physical space around me in which I participate through my mood. On the other hand, the space of moods attunes my mood as well. Moods are bodily.

When designing LBG structures, we have the opportunity to involve and affect the player's perception, possibilities, and moods in physical places. The LBG can draw the player's attention toward certain elements; it can guide players toward certain actions, and attempt to raise certain moods. Our bodily experience of the world is pivotal for our understanding of the world (Merleau-Ponty, 2002) be it physical or digital. As LBGs can affect our perception of the surrounding world, they can also affect our understanding of it.

Everything we see, hear, touch, smell, and taste is experienced through our bodies (Meyrowitz, 1989, 2005). We are not just *in* space and time – we inhabit space and time, we belong to them, and our bodies combine them (Merleau-Ponty, 2002). We experience the world from a certain point in time and from a certain location. We know that from where we are the horizons of space and time stretches – i.e., if we can experience an object from another point in space and time than the present, which affects our experience of it (Merleau-Ponty, 2002). Since we cannot be two places at one time, or at one place at two different points in time, we are bound to space and time (Meyrowitz, 1989, 2005). This also means that our experiences are bound to our physical location (Meyrowitz, 2005). However, although we sense the world locally through our bodies, what we sense is not always local and we do not make sense of the world from a purely local point of view (Meyrowitz, 1989). We experience place through the process Meyrowitz dubs as a "generalized elsewhere" that "serves as a mirror in which to view and judge our localities. […] We are less likely to see our physical surroundings as the source of all of our experiences" (Meyrowitz, 2005, p. 23).

This generalized elsewhere is affected by technologies (such as trains and planes) and media (Internet, phone, etc.). As our world is growing – we are connected to other places – other places can have a greater effect as part of the generalized elsewhere. LBGs let players connect places locally, but they can also provide players with fresh perspectives on the local, such as, e.g., players of *Frequency 1550* who experience medieval Amsterdam. This is a perspective that lets players transcend being bodily bound to place and time, and reveals the horizons of particular places in Amsterdam.

In conclusion, when designing LBGs, it is fruitful to distinguish between *space* as the structure, the paths and connections designed for, and *place* as the actualized space in which players engage. Space and place are affected by development of technologies and our movement in them. However, LBGs can also enable players to create structures when they are mapping their surroundings, as in *CitySneak*. In this game, players create structure and nodes, which are then connected through movement. For instance, a player of *CitySneak* moves through the streets, marking the exact positions of surveillance cameras, and sharing this information with others. The infrastructure of cameras already exists, but by mapping them, the player makes them accessible to use in new ways. Thus does *CitySneak's* structure enable the player to create a new structure that can shape practices. When designed and used in this way, players of LBGs can create not only places but also spaces.

Space and place can be materialized in different media. In video games, e.g., we engage in digital spaces that we can explore and inhabit, so that they become concrete places for us. We can also carry portable devices connected to the Internet with us that affect our interaction with the world and thus our experience of the everyday world. In the following two sections, we will look at digital and mediated spaces, respectively. Let us next move to an examination of digital spaces and content to understand how using digital code in LBGs affects these games.

3.1.2 Digital Space and Content

Digital space is a modeled space, a visual representation of the physical created by programming code, and it is made possible due to the computation of graphical data. Digital

space[8] is primarily a medium of representations (Böhme, 2007). However, it "lends" features from the space of bodily presence, as we can always act in a digital space and often – as is the case in video games – we can participate emotionally in the digital space (Böhme, 2007).

Programming code is a machine language that designers can use to sculpt spaces. In order to understand how this affects LBGs, Hayles' (2004) analysis of how media affects content is related to LBGs. According to Hayles (2004), content and message is "mind," and media is the "body" of whatever is being conveyed. She analyzes specific features of electronic hypertext. Hypertexts are characterized by having "multiple reading paths; some kind of linking mechanism; and chunked text (i.e., text that can be treated as discrete units and linked to one another in various arrangements)" (Hayles, 2004, p. 72). Some of her points are relevant to LBGs considering that code is used to create digital spaces and that games have multiple paths and linking mechanisms, and can consist of discrete units linked to each other. Players of LBGs are creating links in the city. Unrelated units, places and stories, are related by the movement of players (we will return to this in Section 3.4.2). Guiding movement that creates links does not require digital media. It can be achieved through "coded" activities, such as a «.walk», which is a walk through an urban area guided by instructions corresponding to an algorithm (see Figure 16). However, by using digital media certain features can be used: e.g., the player knows that the LBG can respond to some of her actions, that the game can adapt to the situation, e.g., by presenting players of *Frequency 1550* with certain information when entering a specific area or hiding information until certain conditions have been fulfilled.

```
//Classic.walk
Repeat
[
1st street left
2nd street right
2nd street left
]
```

Figure 16: Example of a «.walk» algorithm (Zentrum für Kunst und Medientechnologie Karlsruhe).

Hayles argues that "code always has some layers that remain invisible and inaccessible to most users" (Hayles, 2004, p. 75). Players of LBGs do not know if everything is being revealed to them when they visit a location. For instance, in *Land of Possibilities?* NPCs hide information from some characters and reveal it to others depending on the characters status. Presenting digital content, designers can play on this accessibility hiding and revealing

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[8] Böhme uses the term "virtual space" in his definition. However, clearly he connects it with computation. To avoid misunderstandings, the term *digital space* is used, as virtual can also refer to a potential space that is not linked to computation (de Souza e Silva & Sutko, 2011).

content to users adapted to a certain situation, e.g., players do not receive citizenship in *Frequency 1550* before they have found the holy relic missing. In playing an LBG, designers can chose to reveal information depending on the situation. The code is deep as it can manage multiple layers at a time and leads the player toward exploration and surprises, due to the hidden layers of content.

Using computation in LBGs means that we can transcend being bodily bound to time and space, as pointed out in the previous section, but we can also transcend some of our abilities. This transcendence is offered through the access to layers of information but also because computers can collaborate with humans in creating content, as they interpret the input of the user and can adapt the output toward this output (Hayles, 2004). As this happens in collaboration, cognition is distributed between user and machine, designers and users (Hayles, 2004). This positions the user as a "cyborg": "spliced into an integrated circuit with one or more intelligent machines" (Hayles, 2004, p. 85). This is only true if the system is designed so that users can in fact use it as a thinking tool through which users can learn through a process of exploration and discovery (Murray, 1998). This means that using computation in LBGs can empower us, while we move through our everyday spaces, allowing us to transcend our grasp and abilities as it provides us with information, perspectives, and an extended reach. By the use of code, *REXplorer* can present players with information depending on their context; *Treasure* can provide players with otherwise "hidden" information such as the accessibility of Wi-Fi connections; and *Feeding Yoshi* allows players to leave traces, the plantations, for others to see and thereby extends the human reach. Computers can offer an extension of human powers (Murray, 1998).

Another feature of digital code is that it is dynamic; code does not stabilize into a final form. Small changes in code – e.g., changing a parameter – can result in major changes experienced by the user, meaning that digital content is mutable and transformable (Hayles, 2004). It is a living material. In LBGs like *Treasure*, the size of play-space and amount of coins in relation to the physical space in which players are situated can be changed by altering parameters in the code. LBGs can thus adapt their content to physical space. Content conveyed through code is also dynamic in the sense that it can be fragmented and recombined, and again, this is often happens on a level inaccessible to the user (Hayles, 2004). We see this in *REXplorer* in which players experience a story distributed into Regensburg and recombined through the players' movements, as the players move from location to location, meeting spirits there who

offer narratives and quests (Ballagas et al., 2007; Walz, 2010). In this way, digital space can provide players with multiple paths between chunks of content, meaning that digital spaces are spaces to navigate (Hayles, 2004).

Even though digital spaces represent something, they are not only representations, because they always have a "space of actions," as they present possibilities for action for the users (Böhme, 2007). If we watch a movie, we cannot decide whether John Wayne should shoot or not; on the other hand, if we play a game in digital space, we can get *involved in* and *act on* the representation (Böhme, 2007). Users must navigate digital spaces and make choices to progress through them (Hayles, 2004). The player's moods (emotions) can even be influenced when confronting a digital space through an avatar that the player controls (Böhme, 2007) since the player identifies with the avatar and is   affectively involved (Calleja, 2007). Participating in spaces through an interface can affect the player's perception of space as well. Böhme uses the example to put on a data glove or stereo glasses and go into a digital cave to interact its representations. Doing this, the bodily "I" is *present* in a space of representations, as the space of representations is attached to the body by the glove and thus affects the perceptions of the physical space (Böhme, 2007). However, the LBG players are not acting in play-space through a representation (an avatar); they are bodily present in the play-space. Still, in a range of LBGs, part of the game-space is in a digital space, e.g., the coins in *Treasure* are seen on the screen, but players have to act in physical space – move across the lawn – to control the representation on screen.

Putting the stress on digital space and drawing players' attention toward this when designing LBGs, we risk that the LBGs excludes both other people and the richness of the physical space from our experience. This was exactly what Weiser criticized the design of personal computers (PCs) and virtual reality for doing. Instead he presented an ideal of integrating computation in the physical world, that encouraged users focus their attention on the task at hand rather than on the technology (Weiser, 1991; Weiser et al., 1999). However, the focus on digital content has been pointed out as a challenge in design of LBGs as well. Kristiansen does this, as he evaluates the design of the LBG *Gainers n' Drainers*, in which players must avoid people (or rather their Bluetooth devices) who are drainers and therefore take points, and seek gainers, which will reward players with points. Its focus on the use of technology is probably the main reason that "as a game [...] it was not a success, as few wanted to play it

again. What went wrong was probably the design process, which focused on the use of technology, rather than on making an entertaining game" (Kristiansen, 2009, p. 49).

Kristiansen advocates for a greater focus on location, game mechanics, and technology concurrently: Instead of making some nifty technology the point of departure for the design, the intended experience and thus use of locations should guide the design process. By not challenging the focus on technology, as Weiser did, LBGs are criticized for mere superficiality:

> Still, although the Weiser design ideal is still strong in the HCI [human computer interaction] community, it has only marginally affected research on mobile games. Instead, these have taken their main inspiration from computer games and used locative and gesture-paced technology as a way to spice up an otherwise virtual experience. Although many studies report on the strong player engagement that the "coincidental" relationship to the real world leads to, mobile games make no attempt of creating any "Holodeck" illusion in the physical world. (Waern et al., 2009, p. 1549)

This quote indicates that LBGs (mobile games) put too much emphasis on technology, beyond considering how the LBGs can make use of the affordances of the physical space. This can result in a game where players run around looking more at the screen of a device than exploring their surroundings; the result is that "current mobile games are often portable versions of classic computer games where the focus is on the interface and screen" (Gustafsson et al., 2006, p. 2).

When we use digital space and content in LBGs, it should not take the player's entire focus. Rather, it should support the experience that the designer wants to create. To create certain game experiences can require certain technological solutions (Walz, 2010). Waern et al. (2009) mention a "Holodeck" illusion in the quote above that refers to an experience of being immersed in a fictional universe. This phrase makes a reference to the book *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (1998) in which Murray explores the possibility of using computers for storytelling. She discusses how the computer is reshaping stories and her belief that computers are "liminal objects" that rest on the threshold between external reality and our minds (Murray, 1998). When telling a story, this means that the

things we imagine can be accessible to us and we can interact with them. However, LBGs are not always aiming at telling stories, as we have seen with the examples in Chapter 2. Players of *Treasure* can enjoy the game without being brought through a narrative. Further, when we use computation in LBGs, it not only interfaces between the external reality and our minds, but also encompasses the body as well, affecting our perception and emotions.

Players of LBGs are not playing in digital spaces; LBGs are situated in a hybrid between the space of representations and the space of bodily presence. The boundary between digital and physical spaces is explored through LBGs, and the understanding of the relation affects the design of the game. In the next section, the mediated spaces that emerge as LBGs combine digital and physical spaces are discussed.

3.1.3 Mediated Spaces

Location-aware technologies can be used to relate digital and physical spaces. In this section, we discuss three ways of relating them: 1) as separate entities (mixed reality), 2) as augmenting each other (augmented reality), and 3) as intertwined (hybrid reality). We start by looking at how, in LBGs, digital space is made available to players in physical space.

Walther (2007a) addresses this accessibility of data when discussing the relation between distributed information space (digital space) and tangibility space (physical space). In other words, information is made available in tangibility space. Tangibility space is the physical everyday space, but it does not consist of the entire real-time world; it is a playable section of it. For instance, imagine we are playing *Treasure*. The game is played via a mobile phone. When the game is turned on, it measures the outdoor space the player is situated in – in this example,

Figure 17: The relation between distributed information space (digital) and tangibility space (physical) made available through accessibility space.

we are in a park. The park is tangibility space. Distributed information space, on the other hand, is digital information distributed in an environment. Distributed information space is a representation of tangibility space, but at the same time, distributed information space tracks player movements and changes in real time (Walther, 2007a). In this way, distributed information space is both distributing and retrieving data from the tangibility space. In our

example, the LBG *Treasure* distributes information onto locations in this space: It makes an outline of the game-space, and distributes "coins" and locations for uploading coins on the map of the mobile phone (see Figure 18). It also tracks our location in relation to these entities. This information is held in the system and is not accessible in tangibility space. It is made accessible to the player via the screen of the mobile, and through moving the mobile phone (and body), the player can interact with it: Accessibility space makes both the section of tangibility space – as part of the game – and the distributed information available to the player. Thus accessibility space maps the information distributed and connects it to tangibility space (Walther, 2007a). Accessibility space filters and organizes tangibility space, and at the same time, it projects or embeds distributed information space onto tangible reality. Walther's theory (2007a) strives to explain how digital information is organized in the physical world and is made available to players. Again, we are relating to the layers hidden and revealed to players (Hayles, 2004). In this model, distributed information space (data) is the LBG system, and accessibility space is an interface between the physical world and the game system. Walther's model relates to how the relation between physical and digital space is designed, not how it is experienced. The understanding of the relation between the two spaces, in relation to how they are made accessible to players, affects the experience of these spaces.

Figure 18: In *Treasure* coins are distribtued. Wi-fi access is marked by a color (Courtesy of Matthew Chalmers)

Anticipating digital and physical space as separate means that players can have access to separate worlds – which may be distinct (Lindley, 2005). Players can explore the boundary between separated spaces, while they play together but are separated between digital and physical environments, as seen in the LBGs *CYSMN*, *URAAY*, and *Frequency 1550*. The researchers behind *CYSMN* and *URAAY* term them MRGs (Benford et al., 2006; Flintham et al., 2003; Gaver et al., 2003) to point out how these games let players experience separate "realities." MRGs are games that place players in separate spaces: some players are acting in a digital world and some in physical space simultaneously (Benford et al., 2006; Flintham et al., 2003; Gaver et al., 2003; Montola et al., 2009). Mixed reality as a term derives from the

concept of the "virtuality continuum" (Milgram & Kishino, 1994), which has virtual environment and real environment as the extremes. Mixed reality is found *between* the extremes of the virtuality continuum. Though mixed reality allows merging digital content and physical world, it still creates a separation between "real" and "virtual," as Milgram and Kishino's definition suggests. Actually "physical" and "digital" are more appropriate terms for these extremes, since the concept virtual is used about both potential space and space related to computing (de Souza e Silva & Sutko, 2011), which causes confusion. In addition, if virtual is seen as a result of computation, it cannot be said to be the opposite of real, since these digital objects can be quite real and have a real value to people.

Instead of creating a separation between digital and physical space, LBGs can overlay and embed distributed information onto the physical environments. Manovich (2006) is concerned with this tension between physical space and embedded information he calls augmented reality that refers to "physical space overlaid with dynamically changing information, multimedia in form and localized for each user" (Manovich, 2006, p. 219). What is particular for this kind of space as opposed to other spaces overlaid by information is that the information is coded in augmented spaces, and thus it is dynamic, and we can have it delivered to devices that we carry around (Manovich, 2006). Augmented space is dense with information – or data – that is retrieved from it and delivered to it. Examples are surveillance cameras (extracting information), cellspaces[9] (both delivering and extracting information), and electronic displays (delivering information). In this way, these technologies turn physical places into data space (Manovich, 2006). This extraction and delivery of information needs to be integrated with place. Therefore, architects and artists should consider "[…] the 'invisible' space of electronic data flows as substance rather than just as void – something that needs a structure, a politics, and a poetics" (Manovich, 2006, p. 237). This is relevant for the design of LBGs as well, since they handle flows of data retrieved from and delivered to an environment. For example, *CitySneak* plays with the data space that surveillance cameras create.

Instead of seeing digital and physical spaces as separated or overlaying, they can be experienced as intertwined with our everyday practices. This can happen when we interface our mobility in the city with the use of location-aware technologies: Information, technology,

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[9] Also referred to as mobile media, wireless media, or location-based media (Manovich, 2006)

space, and experience are intertwined (de Souza e Silva & Sutko, 2011). The mobility of players in LBGs is creating meaning, and places (de Souza e Silva, 2006; Dourish, 2006). Through the constant movement of players who carry portable devices continuously connected both to the Internet and to other users, hybrid spaces are created (de Souza e Silva, 2006).

> Hybrid spaces merge the physical and the digital in a social environment created by the mobility of users connected via mobile technology devices. The emergence of portable communication technologies has contributed to the possibility of being always connected to digital spaces, literally "carrying" the Internet wherever we go. Because many mobile devices are constantly connected to the Internet […], users do not perceive physical and digital spaces as separate entities, and do not have the feeling of "entering" the Internet, or being immersed in digital spaces. (de Souza e Silva, 2006, p. 263)

The construction of hybrid spaces requires communication and social interaction, as opposed to augmented spaces, which do not (de Souza e Silva, 2006). Consider the surveillance camera filming us as we walk down the street. It creates an augmented space, although we do not have to communicate with it or interact with it in order for it to do so. Hybrid spaces emerge from social practices that co-occur in digital and physical spaces together with mobility of the user (de Souza e Silva, 2006). The users are in a hybrid space when they do not *experience* being in separate spaces, while using both physical and digital media. Games based on hybrid spaces do not have a primary play-space, spaces flow together. Mäyrä and Lankoski (2009) emphasize that with LBGs, we see a shift from virtual reality that blocks access to the real surroundings and submerges users into a second reality to hybrid reality that offers users an opportunity to interact with their surroundings. This places a demand on game design set in hybrid space, as the design should focus on player's creativity and interaction with the environment (Mäyrä & Lankoski, 2009).

Inclusion of and interaction with the players' (physical) contexts is a defining feature of LBGs (Benford et al., 2003). However, as shown in this section digital and physical spaces can be related in different ways. Whether LBGs are designed to allow players' experience and access to digital and physical space remain separate, augmenting each other or being intertwined depends on the design of the LBG. All three solutions can be fruitful, as long as

designers are conscious of their choices and not just blocking out physical space by focusing on technology or merely trying to transplant a video game into a new medium, and not considering fully the possibilities of this new medium.

LBGs' incorporate physical locations in their game-play. This is a defining feature and the main potential for LBGs. In the next section, we discuss the relation between LBGs and physical locations.

3.1.4 Locations as Play-Spaces

Since LBGs are not set in fully designed spaces, it is not possible to make everything in the setting reinforce the theme and to avoid elements contradicting it, so that the setting comes across as "one whole" as it is recommended for experience settings (Boswijk, Thijssen, & Peelen 2005). LBGs do not draw the players into an entirely imaginary world as a theme park or video game does (Carson, 2000; Jenkins, 2004); rather, they can draw play and the fictional into real spaces (Benford et al., 2006). LBGs do not tend to have carefully staged environments, such as LARPs, or carefully crafted story lines as ARGs do (Waern et al., 2009). Instead, the relation between digital content and physical locations is the particular focus for LBGs.

LBGs are played in mediated spaces that present certain relations between physical and digital media. As shown in the LBG walkthrough, these also relate differently to locations: The LBG can hide digital information that the players seek, the LBG can make game events happen when players are in the proximity of defined entities. The LBG can use the location due to its atmosphere/authenticity, its infrastructure or topography. The LBG can provide structures that turn locations into scenes of performance. LBGs can also merge physical locations and digital spaces and allow players to leave traces and expand reach (cf. p. 21). As shown these relations can be combined in the same game. The relation between LBG and location is defining in terms of the game-play, and it is central to consider this relation in order to design LBGs that facilitate meaningful meetings between players and locations. Let us have a look at how these relations can be categorized.

In this dissertation, location is understood as a specific position in space, a place that is embedded with meaning through the LBG. De Souza e Silva and Frith offer a definition of

location that relates locations to location-aware technologies, which is useful in the context of LBG. Locations augmented by location-aware technologies

> still include fixed geographical coordinates, but they now become dynamic, not because they are mobile but due to the constantly changing amount of location-based information that is attached to them. Different from places, which do not necessarily include digital networks, the meaning of location is becoming intrinsically linked to the presence of location-based information. But now locations also acquire many of the characteristics formerly attributed to places, namely their networked and dynamic aspects, their social aspects, and their meaningfulness. (de Souza e Silva & Frith, In press)

Locations are places that are localized via location-aware technologies and have fixed coordinates in GPS, and thus they include digital networks. Though a place is not a location, locations share many of the features of places.

LBGs relate to specific locations in various ways. LBGs can be *location-free* when they can be moved from one location to another and are not attached to a specific location. *BotFighters* is such a game. Here, players seek out opponents and thus bring the game to each other. A location-free LBG still relates to locations but they are described in a generic rather than specific way (a person, a café, a bench, etc.) (Montola et al., 2009). This is also called a site-relative game (Kristiansen, 2009). On the other hand, LBGs can be based on specific locations chosen by the designer; these are called *site-specific* LBGs (Kristiansen, 2009; Montola et al., 2009). *REXplorer* is one such example, since players visit specific locations that are incorporated into play in terms of both story and tasks. For instance, players must find and decipher a gravestone at the Regensburg Cathedral (Walz, 2010). These games are created for particular locales and cannot be moved to another venue without altering the game significantly. A middle ground between these two types is a *site-adaptable game* (Montola et al., 2009). Here, the content of the game is adapted to generic elements found in most places. This strategy is used, e.g., in *Treasure* where coins are distributed in areas outside of Wi-Fi access. Another example is the LBG *Backseat Playground* that uses GIS information to adapt game content along a non-specified route. We will return to this game below (see page 50). Whether location-free, site-specific, or site-adaptable, the outcome of LBGs is related to the player's locations during the game (de Lange, 2009).

Location can have a neutral role, as it is appropriated for its spatial properties (Reid, 2008). When location is neutral, it is location-free. In location-free LBGs, it is the player who creates the connection between locations and LBG, keeping within the limitations and affordances provided by the LBG. Instead of the designer integrating location into the game, the player can do this through his/her actions or by mapping digital objects or placing physical objects in the physical world. In *BotFighters*, players connect the game to location by moving around, or in *CitySneak* players, localize surveillance cameras, which are mapped for others to see. Although the map in *CitySneak* did not support localizing cameras worldwide, this could be done, making the game accessible in all areas with surveillance cameras. Localizing local elements and sharing them worldwide expands the local onto the global scale. This phenomenon is called network locality – the local expands the global, as local interaction becomes embedded with networked connections (Gordon, 2009). LBGs are directly linked to shaping local space and place, as they encourage players to interact with, map, and connect locations. Players connect the LBG to location and have a personalized experience doing it – they are expressing themselves through their action in relation to the location. In this way, the location-free LBG is connected to specific locations by players but can be played anywhere (Reid, 2008).

When location is highly relevant, the LBG is site-specific. Location often has a high relevance in LBGs, as its physical, social and cultural properties are integrated into the game (Reid, 2008). Specific locations can be seen as media that can tell stories and provide atmosphere in an LBG, as is done in *REXplorer* using the cathedral as a location due to its history, its meaningful quality, and the way it relates to the story. Davies (2007) points out that space and place can be used to convey narrative and aesthetic information. He treats space as a potential that can be tapped into and place as the actualization of space similar to Dourish's (2006) suggestions. Space is ripe with content, embedded memories, and nostalgia waiting for the player to ascribe meaning to and redefine it as a places (Davies, 2007). Davies suggests tapping into this richness when designing pervasive games – which is relevant for LBGs as well, as they relate to physical locations. Locations are localized, networked places, and thus they inherit some of the features of places. Places are dynamic entities that are constantly being redefined and reshaped by the movement and communication between them (Massey, 1993). Thus, we cannot see a place as a source of stability and a unique identity untouched by other places: Walking down the street, we see restaurants offering

food from foreign countries, ornaments reminding us of earlier eras, etc. Place "includes the scope of experience, interaction, and the use of space by its inhabitants" (Davies, 2007, p. 3). As such, places are full of internal differences and conflicts, and the specificity of place is continually reproduced (Massey, 1993). Consequently, it makes no sense to discuss the "identity" of a place, as a place will have several identities. Places are in a constant state of becoming; they are processes created through interaction and use. This means that in creating LBGs, we should not hunt for *the* identity of a location but can relate to different aspects or even allow players to express their relation and develop new ones.

The size of the physical locations in LBGs can be vast or limited (Reid, 2008). With site-specific games, the size of physical location is normally limited and designers can explore locations within this area through methods discussed below (cf. p. 52). This becomes more difficult when the LBG is set in larger areas. Making site-adaptable LBGs, designers can address the challenge of generating digital content and distributing it into immense areas (Gustafsson et al., 2006). Gustafsson et al. (2006) have developed the game *Backseat Playground* that relates game content to locations using GIS data as a source. Doing this, children sitting in the backseat of the car can play a game that adjusts to the immediate context of the car on every possible route the car might take. In *Backseat Playground*, prepared content is triggered by GIS information in the surroundings of a car. An example is an encounter with a wolf in the game. The event is triggered at geographical objects such as forests, woods, marshes, and nature reserves. When the car approaches one of these objects, the sound of a wolf howling is heard (Gustafsson et al., 2006). This is also an example of how LBGs provide a twist of reality through the use of computational augmentation (Waern et al., 2009), i.e., it is the digital content that is unlocked by players being at different locations that frames the forest just passed through as the 'home of the wolf'.

These three categories, location-free, site-relative and site-adaptable, relate to the design of the relation between LBG and location. However, we should distinguish between design and experience as games can be *played*, e.g., as site-specific, regardless of whether they are designed as site-relative or site-specific (Kristiansen, 2009). For example, a game such as *URAAY* is adapted to specific sites. However, the concept can be moved to a new location and redesigned for it without changing all tasks and the storyline (Montola et al., 2009), but players might experience the game as specific for this site. Other LBGs are made for a specific site and cannot be moved, since they relate to particular locations and the elements

found in them. For instance, *REXplorer* consists of such tasks as finding the gravestone at the cathedral and deciphering the signs on it, and other elements that relate to the history of Regensburg (Walz, 2010). This would mean that moving the game would require altering every task and the story, too, thus rendering it a new game.

The three connections between location and LBG presented above relate to which properties of the location are used in the game. In relation to who is creating the relation, Reid suggests three different possibilities (Reid, 2008, p.19):

- Designers choose specific locations due to their specific properties
- Users map the virtual game overlay onto physical space while playing
- The LBG adapts to infrastructures as part of game-play through seamful design

The designer, player, or system creates the connections according to Reid. Kristiansen suggests four strategies when relating game content to locations in the game world (Kristiansen, 2009, p. 112):

1. Known places of the real world used as game elements
2. New game properties assigned to well-known places
3. Game properties assigned to a specific site, effectively turning the site into a place
4. The player establishes new places in the game (this turns a given site into a place)

1) Known places are not technically augmented by the LBG but are used as they are in the game. Properties of space can affect the way the game is played, limiting or facilitating the game actions. 2) By augmenting locations and elements in them, they can play a role in the game – Kristiansen uses the example that statues "talk." 3) The game can change the meaning of a location – the example Kristiansen offers is letting a crossing signify a hole in the game. 4) The player places game content in the game (Kristiansen, 2009).

Kristiansen mixes two levels here. The first three strategies (using properties as they are, augmenting properties, changing the significance of properties) relate to the meaning of the properties of a location, whereas the fourth is concerned with how the relation is created:

Users can place content either using the properties as they are (positioning surveillance cameras) or changing their meaning.

These two levels are relevant to consider when designing LBGs: A) how and by whom is the relation between location and in-game meaning created? B) How does this relation connect to the properties of the locations? These two questions relate to framing elements intrinsic to the location: Who performs the framing, and how is it framed? And finally, how does the frame relate to the original meaning of a given element (this is discussed further in Section 6.2).

Locations in the everyday world are not unambiguously conveying what designers want them to. As locations are dynamic entities in constant flux and beyond the designer's control, we cannot use locations to simulate a certain meaning in LBGs. Instead, players need to interact with the location to uncover the meaning of an element through the LBG. To understand these two processes, we distinguish between simulation and dissimulation. According to McGonigal, simulation makes empty promises: "The image is not, in fact, the thing itself, the referent, but rather simply one of infinitely many cognitively convincing references" (McGonigal, 2007a, p. 235). Dissimulation, on the other hand, feigns a lack of promise: "The seemingly ordinary object conceals its own extraordinary capabilities" (McGonigal, 2007a, p. 235). Dissimulation is not obvious and it requires attention to acknowledge its nature, whereas simulation bluntly reveals its true affordances, i.e., the perceivable properties that help players to understand how to interact with elements. This is the vision behind Weiser's ubiquitous computing (Weiser, 1991; Weiser et al., 1999). Using this technology allows designers and players to ask the question: "What are the secret gaming affordances of everyday objects and spaces?" (McGonigal, 2007a, p. 235). LBGs also are embedded in everyday spaces dissimulating rather than simulating content. Thus, in LBGs we ask also about the gaming affordances of everyday space. This affordance does not have to be related to telling a story; it can also be spatial properties such as a hilly area that could be interesting in a game of chase, like *CYSMN*, or structural aspects such as the surveillance cameras or the Wi-Fi zones.

Designing an LBG, the designer or player must relate to the affordances of the locations the LBG involves. In site-specific LBGs the designer must find a "fit" between locations and game (Kristiansen, 2009). Doing this it is important to remember that it is not only the

designer and player who perform in order to create an experience. The location itself affects the experience of the player, as it performs (Kristiansen, 2009). Locations affect our experience more or less directly, and the designer should be conscious concerning this role of the location in order to make it work *for* the LBG (this is discussed further in Section 7.1).

When looking for these affordances, the designer can make use of a framework that guides the exploration of an environment. To do this in LBGs, we can draw on a framework developed by landscape architect Lamm (2002). The usefulness of her framework is that it considers both digital and physical spaces, as it is developed for landscaped gardens and virtual reality. These are spaces sculpted for experiences, and although LBGs as mentioned are not sculpted, such design knowledge proves useful when looking for interesting aspects of urban space to involve in LBG play-spaces. When I designed *Visions of Sara*, I used this particular framework as a guide. According to Lamm (2002), spaces can be read through the following aspects:

> A *structuring* aspect in which the plan of an area is viewed from a bird's eye view
>
> A *metaphorical* aspect of a location encompassing references to stories and ideas
>
> An *experiential* aspect, i.e., the location experienced when moving through it

The structuring aspect organizes the space from a bird's eye perspective. It focuses on describing what is at which position and the relation between these elements. When reading a space with a focus on the structuring aspect, the reader does *not* experience the space, but learns about the structuring idea of the space, its legitimacy. An example of this can be seen when we look at a map of the Versailles gardens (see Figure 19), which is built around a center axis, with a strong emphasis on symmetry (mathematics). The idea conveyed through the structuring aspect here is the idea of reason

Figure 19: Versailles' Garden Plan (Andre Le Notre, 1660).

reflecting the divine (Bek, 1999). In LBGs, the idea of structure can be created through the crafted paths that make players visit locations in a predetermined sequence, or as in *CitySneak* that divides public space into surveilled or non-surveilled areas.

The metaphorical aspect encompasses all symbols and metaphors that refer to something outside of the present space. The metaphorical aspect encompasses the stories and ideas

embedded in the environment (e.g., in decorations see Figure 20). The metaphorical is readable elements that evoke associations to stories, places, and ideas. In this way, the metaphorical aspect expands the present by changing position along the horizons of time and space. Locations in LBGs can also mediate the combination of time and space, as the plot of a story can be distributed in space. Elaborating on the

Figure 20: A decorative reference to Greek mythology (Odense).

relationship between narratives and space, Lamm (2002, p. 216) points out that

> the spatial orchestration can be seen as a narrative gesture in two ways. First of all, as a time-based sequence that is defined by the path that takes the protagonist through the space. Secondly, as an iconographic structure where plan and elements that constitute the space refer to specific myths or ideas.

The point is that, when designing a spatial experience, the designer creates a narrative expression. The designer can do this by making a path that leads the wanderer through a story – a sequence. The path tells different stories depending on how it connects hills, creeks, houses, winding roads, big factories, playgrounds, and so forth. The designer can also embed elements of a story at locations and make connections that connote a theme or make

references to myths or ideas outside of the immediate reality. Finally, the designer can create a structure that enables players to tell a story.

The experiential aspect is concerned with the elements in a space that affect the protagonist's body and the atmosphere of the given space. This situated aspect relates to experiencing the space of bodily presence with its possibility of space, atmosphere (moods), and perception. As with any experience setting (Boswijk et al., 2005), the LGB player's five senses should also be involved to engage the protagonist as he or she engages in the location. In LBGs, we can stimulate players by making use of sight, smells, sounds, equilibrium, or imbalance of a location, scale of the location, weight of, e.g., the walls at
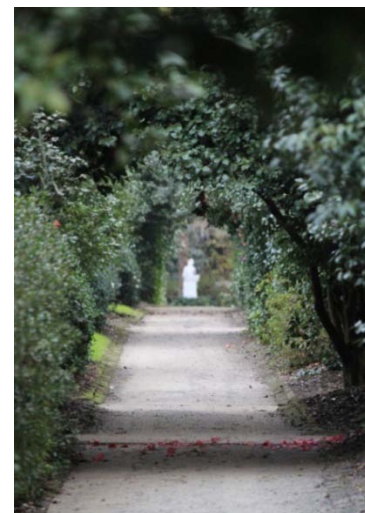
Figure 21: Experiential aspect: A straight, covered garden path guides the protagonist's gaze to the statue. The path surrounds the body of the protagonist (Middleton Place, Charleston, USA)

a location, lighting, etc. Using experiential aspect in the design holds great potential for LBGs, since players are physically present in the game environment (this is explored further in Section 6.3).

When designing a site-specific LBG, the game designer can scout for these three aspects (structural, metaphorical, and experiential) that already exist in the area for which the game is designed. Considering these aspects gives rise to a range of design questions. For example, what are the relations between the elements in an environment and how can we connect these elements through paths in the LBG (structuring aspect)? Which ideas and stories are already embedded in the environment, and can they be used as a part of or work against the theme of the LBG (metaphorical aspect)? What is the "feel" of the location, i.e., what kind of atmosphere exists in the environment in which the LBG is set, and how can it serve the game (experiential aspect)? Which kind of physical qualities mark the location, and how will they affect the player's experience (experiential aspect)? These questions help designers exploring an environment for gaming affordances.

Lamm does not describe a "social aspect" of space, although gardens often have benches, pavilions, stages, etc. Sweetser and Wyeth (2005) have shown that people play for social interaction and thus games should support and create for opportunities for this. In most gardens and games, designers have designed spaces for confrontation, calm withdrawal, and cooperation providing, e.g., benches, combat zones, or chat rooms depending on the platform. I suggest adding a fourth aspect to the framework when designing LBG space, namely the social aspect that relates to where players meet, compete, and collaborate.

The LBG designer can incorporate elements of the location into the game. However, the designer can also create a framework that allows players to make connections to locations and events. These connections can seem coincidental, as there is no obvious causal connection between them. Reid argues that "when a player experiences such a coincidence it feels 'magical' and thus leads to feelings of wonder and excitement" (Reid, 2008, p. 21). In this situation, the connection between an event or a thing and the LBG is created by the player rather than planned by the designer. This is similar to apophenia (Dansey, 2008), which is the process of connecting two unrelated things. Here, it is also the player who makes the connection between, e.g., a random passerby and the quest for finding Uncle Roy in *URAAY*. The player sees order in chaos (Montola et al., 2009). Coincidences and

apophenia can be incorporated in the design. Designing for coincidence, the LBG enables the player to connect elements with no connection through play, as they ascribe meaning to events and things in relation to the game. The LBG offers the player a framework through which the player's perception and interpretation of the surroundings is affected – the patterns of perception. The LBG thus provides a pattern by which the player can use to experience his or her surroundings. Reid describes how a game can draw on understanding and knowledge of an environment to increase the chance of coincidence. There are three kinds of coincidences (Reid, 2008, p.21):

- *Natural* coincidence: a natural event happens that relates to the game-play in some way. For example, a gull lands in front of the player at the very moment when hearing about gulls in the story line.
- *Social* coincidence: the player encounters another player or person who shares a game event with the player.
- *Feigned* coincidence: actors or props are used within a game environment to appear natural.

Feigned coincidence is fabricated, but it seems like genuine coincidence, because players do not know who is and is not an actor. They also do not know which elements are intrinsic to the environment and which one are placed there (Reid, 2008). Designing for natural and social coincidences requires an in-depth knowledge about the game location. This is gained through visiting the location, asking questions about it, and recording the observations (Reid, 2008). This is a guided perspective on the location that focuses on its typical activities and conditions – the rhythm of place that is created by reoccurring movements (Walz, 2010). Likewise, Kristiansen (2009) proposes a "site storming method" that encourages designers to design the game on-site, exploring the site in a guided way to experience it differently.

Whereas Lamm's framework focuses on the spatial feature, Reid focuses on the practices of the location. Lamm's framework must be adjusted when used for LBGs and can be used in general when designing the relation between location and LBG. Reid's approach can be used specifically for designing LBGs that are intrinsic to a specific location and which relate to the practices here, e.g., in *URAAY* that encourages players to follow a person with certain features in the park. Creating a site-specific game demands an extensive knowledge about the location. Through these methods, the designer gains knowledge about the locations that

allows the designer (or the player) to draw upon events that might occur and integrate them into the story and tasks of the game.

Through LBGs, players relate to both physical and digital space. This use of code can provide players with an expanded reach and abilities. Thus, players can affect the structure of space and engage in locations, creating a personal relation to them. Designers should consider the possibilities of using code, the relation between physical and digital space that their LBG conveys, and which structures will enable the kind of game-play they seek. In the next section, we focus on these structures.

3.2 Structure

Throughout Chapter 2, we identified four topics in relation to the structure of LBGs. These were: 1) rules, 2) framing, 3) fiction and authenticity, and 4) uncertainty and ambiguity. The structure enables play practice: it guides the players' actions, interpretation, and attention. However, the LBG designer does not have – and might not want – the same control over *rules* or *framing* as in a video game, since players are playing in the ordinary world, not in entirely coded environments. This also means that the LBG designer has the opportunity to mix *authentic* content such as environments, everyday actions, and events, with *fictional* content. The designer can also blur the framing, so that the context, relationships, and/or information presented are *uncertain* or *ambiguous*, placing a demand on players' ability to navigate frames. These topics are discussed and developed in relation to the design of the LBG structure in this section.

3.2.1 Rules

LBGs challenge the accepted definitions of games. To illustrate, two definitions are chosen that have emerged as a result of analyzing a range of other definitions and that have been discussed in relation to games expanded into everyday spaces earlier (Montola et al., 2009). Salen and Zimmerman (2004) analyze eight other definitions before offering their own, and Juul (2005) refers to seven definitions including Salen and Zimmerman's, after which he relates his definition to LBGs.

Salen and Zimmerman define games across platforms as having rules and objectives that apply to all players, regardless of time and place. A player plays the game to experience play,

and the actions in the game are evaluated by the game system against the objectives of the game – and this evaluation is quantitative in terms of points or levels (Salen & Zimmerman, 2004). The player is not necessarily presented with a number but will be given some sort of result during or by the end of the game. In other words, "a game is a system in which players engage in an artificial conflict defined by rules that results in a quantifiable outcome" (Salen & Zimmerman, 2004, p. 80).

The player engages in performing tasks related to an overall objective. Salen and Zimmerman dub this an "artificial conflict," which is defined by rules. When specifically considering LBGs in relation to the definition we have seen of examples of artificial conflicts. However, the LBG also can be linked to authentic actions, as in *Foursquare*, or it can be a true political conflict, e.g., confronting players with everyday surveillance, as is done in *CitySneak*. Also missing from the definition is that players play these games because they care. Juul offers an alternative definition that reveals a nuanced role of the outcome in relation to the player's attachment to it:

> A game is a rule-based system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels emotionally attached to the outcome, and the consequences of the activity are negotiable. (Juul, 2005, p. 36)

The game is based on rules, and the outcome is quantifiable. However, Juul stresses the prospect of different outcomes; further, the player cares about the outcome. By adding this concept, Juul addresses the idea that games are played for an "emotional" outcome. He strongly emphasizes winning and losing, arguing that players are generally happy when winning and unhappy when losing, and claims this occurs regardless of player effort: even winning by pure chance can bring joy (Juul, 2005). This focus on winning and losing, however, is not relevant in all games. Some LBGs, such as *URAAY*, do not lead to winners and losers, although there is a goal and the achievement connected with finding Roy's office. Finally, Juul states that consequences of play activity are negotiable: The same game can be played twice and result in very different real-life consequences, and it is optional whether this should have real-life consequences, e.g., the same game can be played for the spirit of playing itself or as a gamble (2005). He emphasizes that LBGs break the demand of negotiable consequences. In LBGs, some of the consequences are in fact non-negotiable, since players

are dealing, e.g., with traffic where they can be injured in the real world. In LBGs, game actions also can be related to real-world actions, as when a *Foursquare* player is checking in at his workplace in the morning and into his fitness center at night – these movements and visits are part of his everyday life and the game at the same time. The meaning of these actions is still negotiable.

In both definitions, rules are central to games. According to Juul:

> Rules specify *limitations* and *affordances*. They prohibit players from performing actions such as making jewelry out of dice, but they also add meaning to the allowed actions and this *affords* players meaningful actions that were not otherwise available; rules give structure. (Juul, 2005, p. 58)

In relation to games, Juul (2005) argues that rules are unambiguous, and Salen and Zimmerman (2004) claim that they also can be interpreted consistently. This is partly true for most video games in which the computer program upholds the rules (Juul, 2005) and the limits of the game world and time are often finite. However, rules need to be interpreted in a more nuanced manner than as limitations and affordances in relation to LBGs. In LBGs, the "possibility spaces" is not finite, as players often can use different resources outside the game environment, and using these can affect the play experience. In pervasive games, one of the features is exactly that the game has infinite affordances (McGonigal, 2006; Montola et al., 2009). This refers to the situation in which any object in an environment can conduct an infinite variation of game moves (Montola et al., 2009). Whether there are infinite affordances in LBGs depends on which actions are available in the game and if their scope of authentic action is restricted to movement (Waern et al., 2009) combined with interacting through a portable device. However, it becomes less apparent what the possibilities are in LBGs wherein the player can perform a more complex interaction with locations and other resources.

As highlighted by Montola et al. (2009), Juul and Salen and Zimmerman focus their definitions on *ludus* (competitive games) rather than *paideia* (play). Ludus and paideia are terms developed by Caillois in relation to developing a classification of games. Caillois writes that paideia is "is active, tumultuous, exuberant, and spontaneous" (Caillois, 2001, p. x), whereas ludus represents "calculation, contrivance, and subordination to rules" (Caillois,

2001, p. x). Game theorist Frasca (2001) has related ludus and paideia to rules. According to him ludus terms games reserved for competition, in which players compete with the aim of winning the game (Frasca, 2001). Rules in these kinds of games he calls "ludus rules." Paideia is related to play with less complex rules not related to winning or losing. Frasca call these rules "paideia rules" (Frasca, 2001, p. 19). Both kinds of rules can be present in ludic games, whereas paidiac games do not have ludic rules. In a ludic game, there are ludic rules regulating the actions related to quantifiable outcomes and paidiac rules related to process. When playing the LBG *CatchBob!*, the ludic rule instructs players to find "Bob" and surround this object, and the paidiac rule instructs players to use the game device for written communication and restrict players from communicating orally. The ludic rule sets a focus on the goal and gives the players a purpose for running around campus with a tablet PC clenched in hand. They would not do this without this rule constituting a behavior. The paidiac rule regulates this behavior and focuses on how to act while finding and surrounding "Bob."

When combining these two types of rules, rules can be understood as a co-existence of presence and intentionality (Walther, 2007c). The paidiac rules relate to being there (presence) exploring possibilities, and ludic rules relate to progression that is supposed to motivate the player's actions, moving around for a reason, i.e., intentionality. Walther has related two types of rules to pervasive games that are similar to ludic and paidiac rules though more nuanced. These are constitutive rules that make activities possible and regulative rules that legalize activities (Walther, 2007a). Constitutive rules determine an action's value or meaning in a certain context (X counts as Y in context C) (Boella & van der Torre, 2004). For example, causing the ball to cross the goal line in soccer constitutes a goal when the event occurs on the soccer field and while the match is on. Rituals can also constitute certain values. For example, saying "I do" and signing an official piece of paper in the right context constitutes marriage. These activities depend on the constitutive rule or rituals: The players try to score because the rules constitute this as valuable, and the couple say "I do" and not something else, because these two words constitute a proper confirmation of the marriage.

Regulative rules, on the other hand, regulate activities that we perform independently of the rules. Again, in soccer, consider the act of tackling an opponent. This action is unconnected to a value, it is merely tolerated, and the regulative rules restrict tackling. For instance, it is

not allowed to tackle each other from behind or to tackle a player who does not possess the ball. The regulative rules are related to paidiac rules, whereas constitutive rules are related to ludic rules. In digital games, both types of rules are normally controlled by the computer. According to Walther in pervasive games, the computer program calculates the value of actions, whereas the regulative rules are controlled by players (Walther, 2007a). In the LBGs, the regulative rules are often negotiated by players, e.g., when playing *Treasure*, players must negotiate whether it is acceptable to block each other's way to coins, whereas constitutive rules, those that, e.g., constitute fighting for coins, are often regulated by the LBG system. However, this system is not all computed by the program. A game master or players can be part of the system. Players can, e.g., rate each other's performances, as is done in *Frequency 1550* and thus players can regulate constitutive rules too. In LBGs the computer does not have that hold the game state and constitutive rules as Walther argues.

Having players regulating the rules can result in players cheating. However, Bernhard Suits argues that to play a game, we accept rules as a component of games. Salen and Zimmerman quote Suit's definition of playing a game:

> To play a game is to engage in activity directed towards bringing about a specific state of affairs, using only means permitted by rules, where the rules prohibit more efficient in favour of less efficient means, and where such rules are accepted just because they make possible such activity. (Salen & Zimmerman, 2004, p. 76)

Rules hinder the most efficient way to solve a problem (conflict), and we voluntary make an effort to overcome these obstacles. Suits termed this "lusory attitude" (Salen & Zimmerman, 2004). The player enters a contract accepting the rules for the sake of the play activity (Juul, 2005). It is often the regulative rules that hinder the most efficient way to solve an in-game problem. An example of this is when *CatchBob!* players are not permitted verbal communication to make cooperation harder. However, this game does not control the players' mobile phones; if they reject the rules of the game, and do not adopt a lusory attitude, they might grab their cell phone and cheat by calling each other. LBGs cannot control these kinds of actions in the ordinary world and thus must trust players to maintain a lusory attitude.

The two levels of rules define two types of spaces: Play-space and game-space. Play-space is the space players act in and explore. These are linked to practices and can thus be regarded as places – or 'playces' (Walz, 2010). Game-space, on the other hand, is related to the formal structures regulating the movements of play. In games in which both play-space and game-space are controlled by the game, there are no strident interruptions. However, playing in the everyday world players are not regulated by game-space only and play movements may be obstructed by, e.g., an old lady getting in the way (Walther, 2007c).

Conclusively, LBGs are games based on a rule-based system. The rules that LBGs provide constitute and regulate actions in the ordinary world. LBGs rely that players will accept these rules, negotiate the regulative rules, and at times even some of the constitutive. This means that the rules of LBGs are ambiguous, and that players must engage in structuring practices when playing LBGs. LBGs have variable outcomes, assigned to different values. However, these values are not necessarily quantifiable. LBG players exert efforts in order to influence the outcome, to which they feel emotionally attached. We shall see that this outcome is related not only to the objective of the game, but also to the motivation of the player (see Section 3.4.1). Finally, the consequences of the LBG play activity are sometimes negotiable but can be non-negotiable as well, and they relate to the everyday life outside of play. As indicated, this understanding of LBGs as games is a modified version of Juul's definition.

We have seen that in LBGs, the computer does not control the rules of the game entirely. Technological sustained games such as LBGs cannot value activities outside the game engine (Montola et al., 2009), and the player must take into account the rules of space (Borries et al., 2007a; Sweeny & Patton, 2009) and the law (Montola et al., 2009) against the rules of the LBG. In this way, LBG players negotiate multiple frames during the game (Mäyrä & Lankoski, 2009).

3.2.2 Frames

Frames are boundaries that separate what is and is not in focus. Frames enhance those elements that should be interpreted in a special way, and dispense with those having no particular significance (Bateson, 2000). Like a picture frame, the boundaries of classic single-player video games are often explicit. However, the boundaries of LBGs are not; players do not always know which elements are part of the game and which are not. These boundaries are explored and negotiated between players. The frames of LBGs, distinguishing what is

play from what is not, are explored in this section. First, I will discuss the relation between play and ordinary life, and then focus on how the frame relates to interpretation.

The term "*magic circle*" is often used as a metaphor describing a frame that separates play and the "ordinary" (e.g., seriousness, work, everyday). Huizinga explains that "inside the magic circle, the laws and customs of ordinary life no longer count. We are different and do things differently" (Huizinga, 1993, p. 21). The "magic circle" suspends worldly laws and customs during the game, according to Huizinga. When we play, we can tease or we can "steal." Our actions count differently; they do not mean what they would normally mean. The magic circle is an example of a playground in form and function within which special rules obtain:

> All play moves and has its being within a playground marked off beforehand either materially or ideally, deliberately or as a matter of course. […] The arena, the card-table, the magic circle, the temple, the stage, the screen, the court of justice, etc., are all in form and function playgrounds, i.e., forbidden spots, isolated, hedged round, hallowed, within [which] special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart. (Huizinga, 1993, p. 18)

As it appears from the above quotation, the playground is a temporary, spatial setting dedicated to acts apart from normal behavior. The limits can be there from the beginning (designed) or established through play and are not necessarily explicit.

The term "magic circle" has been linked to Huizinga in relation to his definition of play. However, he only used this term a few times, most often as an *example* of a playground. Huizinga relates to the boundary between play and ordinary in his definition of play as

> a free activity standing quite consciously outside "ordinary" life as being "not serious," but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space, according to fixed rules and in an orderly manner. It promotes the formation of social groupings, which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means. (Huizinga, 1993, p. 21)

Play stands out from ordinary, due to its being "not serious" and its specific meaningfulness. Huizinga (1993) also states that the actions performed as play do not refer to anything outside of the activity itself.

It is Salen and Zimmerman (2004) who have linked the term magic circle specifically to games and expanded it to describe the organization of games. They write that the magic circle is "the idea of a special place in time and space created by a game" (Salen & Zimmerman, 2004, p. 95). They refer to the magic circle as something designed, and they continue stressing that the magic *circle* circumscribes an enclosed space and separates it from the ordinary world. They also write that the magic circle marks a temporal path with a beginning and an end, a finite space with infinite possibilities. Several scholars agree that pervasive games challenge this concept of the magic circle, since pervasive games expand its boundaries spatially, temporally, and socially (Dansey, 2008; de Souza e Silva & Sutko, 2009; Harvey, 2006; Montola, 2005; Montola et al., 2009; Nieuwdorp, 2005; Poremba, 2007; Stenros et al., 2007). LBGs expand Salen and Zimmerman's magic circle spatially, and sometimes temporally and socially, too. In LBGs, the space is not finite, as these games are played in ordinary life spaces.

Instead of separating play from actions in ordinary life, LBG players actually connect these worlds when playing. Copier (2005) points out that when scholars emphasize the separation between play and ordinary life in Huizinga's definition of play, they are misinterpreting it. She argues that Huizinga is actually defining play as ritual acts that connect actions and events *in* play with our ordinary lives. She does this in relation to establishing an understanding of the magic circle that allows her to define digital fantasy role-play "as collections of performances or ritual acts in which players are connecting worlds while constructing the game/play space, identities, and meaning" (Copier, 2005, p. 8). Players are performing a collection of ritual acts connecting the play world with the ordinary world; in doing so, they are constructing the play-space, identities, and meaning. Copier writes about role-play and uses bricolage, i.e., construction or creation from a diverse range of available things, as an example of ritual acts: "Players are constantly creating intertextual relationships between imaginary fantasy worlds, history, religion, experiences from daily life, etc." (Copier, 2005, p. 11). Instead of explicitly dividing play and ordinary life, this approach describes the boundary as permeable and the ways that play and everyday can enrich each other. Similarly, as we have seen, McGonigal uses the word "permeability" in relation to the flow of material

that passes through a boundary, i.e., how much of the game "flows into reality" or "pervades reality" (McGonigal, 2003a, p. 1). This applies when describing what happens in LBGs. Playing an LBG such as *Frequency 1550*, players are creating connections among their knowledge of Amsterdam, the medieval era, local history, everyday experiences with GPS devices, and the fiction of the story. Play happens within the limits of the playground and at the same time the limits are defined through play (Walz, 2010). LBG players are drawing their experiences and knowledge into the game, connecting worlds and thus permeating the boundary between play and ordinary life, but confirming it too.

The magic circle does not completely separate play from ordinary, but it is a metaphor for the boundary between play and ordinary. The boundary is negotiable. As an example of this, Juul (2008) argues that when we play, we are licensed to play to win; however, players of multiple-player games who are ahead often allow their opponents to catch up to make the game more interesting, even though the rules (boundaries) direct players should go for first prize. Also, sometimes we avoid winning due to social conventions (Juul, 2008). For instance, when playing against a child, some might give them leeway to make the game fairer, taking into consideration their age and lack of experience. Even when the boundaries are explicitly stated and goals are clear, the players sometimes still obey social rules not stated by the game (Juul, 2008). Games are not found in a vacuum apart from our social life. Players shift between ordinary and play during the play activity. They do this, as they incorporate expectations and experiences from everyday life, when they consider the rules of everyday life, but also when they pause in performing meaningful actions to negotiate the boundaries of play, e.g., the rules.

In Huizinga's definition, play stands outside of everyday life due to its meaningfulness. However, Huizinga does not analyze how this meaningfulness emerges. When we discuss the frame of the game in relation to meaningfulness, it concerns how we interpret things. To understand this aspect of play, Bateson's idea of framing in relation to play is relevant (Bateson, 2000). He claims that if a situation is framed as play, this means it is communicated that "this is play." Using meta-communication in this way, suddenly an action does not mean what it would "normally" mean. Bateson uses biting among monkeys as an example. When the monkeys bite in jest, it does not signify a bite as it normally would, because it is meant as play. Bateson writes that a *frame* delimits a set of messages or meaningful actions. It is a psychological concept (Bateson, 2000). Sometimes it is consciously recognized and is even

represented in the language, as is the case with the word "play." The frame is neither physical nor logical, although it can be externalized (Bateson, 2000), as is the case in games that have a clearly defined field, e.g., soccer. The frame directs the attention to what is included in much the same way as a picture frame does. At the same time, it draws attention away from what is excluded. The frame is also a *premise* telling the user of the frame that a certain interpretation or mode of thinking applies to what is within the frame (Bateson, 2000). Bateson uses a picture frame as a metaphor for this process: It tells us to notice what is within it and to interpret its content differently from the wallpaper outside of the frame (Bateson, 2000). Playing an LBG, the game points to certain aspects of locations and affects the perception: When playing *CitySneak*, players notice surveillance cameras, and the players engaging in *Feeding Yoshi* focus on unsecured Wi-Fi access points, leaving other elements unattended in the background.
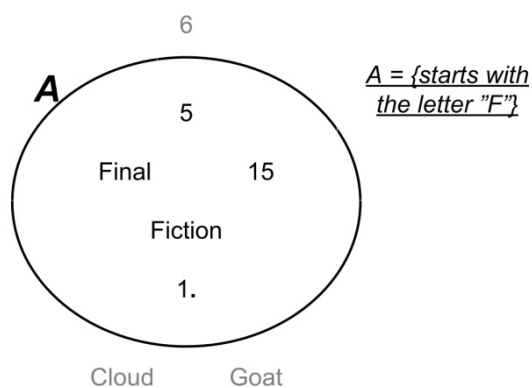
Figure 22: Mathematical set created from an equation.

Bateson uses a mathematical set as an alternative metaphor of the picture frame to describe how an ideal rather than material frame works (Bateson, 2000). A mathematical set contains a rule, an equation that defines what is and is not inside the frame. Our attention is guided toward the contents of it (Bateson, 2000). In knowing, learning about, or creating "the equation" (e.g., Figure 22), players will be capable of setting the boundaries themselves. The players are capable of selecting elements and making them a part of the LBG. They make the connection between elements relevant in the frame of the game and the game experience. In this process, players create meaning and by being part of the meaningfulness, the element becomes part of the experience. In this way, the players participate in creating the boundary. The point to understand is when players engage in an LBG, they can trust that there is an equation – a premise – that makes certain actions and elements relevant in the game, which creates a boundary between play (what is meaningful) and the ordinary (what is irrelevant). Players take part in negotiating what actually makes sense or they even assemble or solve the "equation" during the game. Rules are part of the frame that also encompasses the fiction. Players of games played in everyday spaces, including LBGs, learn to master these through play out in the open (Walther, 2007b, 2007c).

As this account shows, players can expect that there is a premise that can be used to distinguish between what is meaningful and what is not. In this way, the magic circle should be considered as a ritualistic contract (Montola et al., 2009). Events that are carried out within this contract are given special social meaning. When Montola et al. (2009) use the concept of an expanded magic circle to define pervasive games, the magic circle does not explicitly separate play in space and time, and players do not necessarily know who is and who is not part of the game. This differs from many video games, in which the limits are often explicit, and is more similar to play activities, in which rules are negotiated.

In LBGs, the goal is not to create a distinct world (Mäyrä & Lankoski, 2009). Instead, through these games, players can experience how play permeates the ordinary world. Thus, an LBG such as *CitySneak* makes it meaningful to map and sneak around surveillance cameras, letting players relate to the frame of the game *and* how they are expected to behave in a public space at the same time. In this way

> location-aware, hybrid reality play mirrors children's play and everyday situations in how they relate to issues of communication and framing. Participation in hybrid reality play involves the ability to maintain and negotiate between multiple frames of reference, all layered within the same situation. (Mäyrä & Lankoski, 2009, p. 130)

Thus, frames are central for the organization of experiences for LBG play. The frames of the LBGs can be designed, so that the boundary between game and everyday life is blurred. In this relation, Benford et al. (2006) discuss the role of a "performance frame" in LBGs. The term was coined by Bateson (2000) as a cognitive context wherein the rules of behavior, symbols, and their interpretations are bound within a particular activity within its own structure. In relation to LBGs, Benford et al. define it as

> a set of conventions and supporting structures, physical arrangements, rituals and technologies, through which performers and spectators come to understand that a performance is taking place and that sets their expectations of how it works, especially what action is part of the performance and how they should behave. The frame essentially defines a contract between performers and spectators; an understanding of the principles and conventions by which both are able to take part

in the performance and interpret what is happening. (Benford et al., 2006, pp. 433-434)

This frame is not explicit, but negotiated between performers (designers and actors) and spectators (players and bystanders), again as a contract. The frame's purpose is to delimit what is and is not part of the play. However, the frame can be blurred, so that the *apparent frame* is different from the *actual frame* of the game (Benford et al., 2006). Either the apparent frame is bigger than the actual frame, which means that bystanders are involved as "game content," or the apparent frame is smaller than the actual frame, which means that players think props and performers that are actually part of the game are outside of its limits. This is similar to feigned coincidence as described by Reid (2008). In this way, ambiguity is orchestrated into the game.

When we are in play, a psychological bubble encapsulates us, so that we feel secure and not threatened (Apter, 1989). If the "real world" does enter the psychological bubble in some way, it will not disturb play as long, as the players remain unharmed. However, when the boundary is ambiguous players do not know what is play and what is ordinary, which could potentially prove to be dangerous, since players do not know how to understand events and information. In addition, ethical issues could arise in relation to not knowing who is part of, where, and when the game is on, because players might approach people and situations in a way that compromises the rules of the ordinary world (Harvey, 2006; Montola et al., 2009). Consequences of LBG play can be non-negotiable, and it is designers of games that play with the boundary between play and ordinary, such as LBGs, that should ensure players are aware of the consequences of their actions, and that they are participating of their own free will (Montola et al., 2009), so that the players will feel safe.

The psychological bubble that Apter describes as a *protective frame* stands between the player and the ordinary world. It is mainly psychological but can take on either a physical representation or an abstract one – such as a game's rules (Apter, 1989). This also means that the protective frame is not only a feature of the game. The player participates in setting and maintaining the limits. However, when the frame of the game is not readily apparent, unaware participants can be brought into the game. They are not players, as they are not shielded by the protective frame (Montola et al., 2009).

When in play, players should trust that they will not experience real harm by engaging in the game, although it can be hard to determine which actions are and are not parts of the game. Moreover, the players can misinterpret game instructions, leading to serious consequences. Montola et al. (2009) give an example of a player who misread an instruction of a pervasive game, and went into the wrong mineshaft, where he fell down and was seriously injured. In LBGs, this is evident when players move in and out of traffic and in public places that are subject to laws overriding the rules of the LBG (although the players might not attend to them while playing). In addition, the actual boundaries are not always where they appear to be, as Benford et al. (2006) have shown by differentiating between apparent frame and actual frame, pretending that performers and props are not part of the LBGs or involving bystanders in the game.

As play in LBGs is not separated from the ordinary world, but rather uses it as a part of the game, LBGs have the potential of transferring empowerment gained in the playful frame to the frame of everyday reality (Mäyrä & Lankoski, 2009). This makes it relevant to consider Apter's understanding of play as "a state of mind, a way of seeing and being, a special mental 'set' towards the world and ones actions in it" (Apter, 1991, p. 13). Consequently, play is an attitude vis-à-vis the world. Players apply the premise of the game to other areas than the one within the frame, e.g., a player might adopt the "avoid surveillance cameras" stance even when not playing. In this way, play can "spill over" into everyday reality. Likewise, McGonigal notes how the best immersive games (i.e., ARGs) make the player more attentive to the world: "A good immersive game will show you game patterns in non-game places; these patterns reveal opportunities for interaction and intervention" (McGonigal, 2003a, p.22).

Even after the game concludes, the player can be more explorative and attentive to his or her environment, e.g., noticing the historical details related to the medieval era in Amsterdam. In this way, the player is able to take "something" back "home" (Boswijk et al., 2005, pp. 9-10). In LBGs, this could be an attitude or a changed perspective on everyday settings that will endure beyond the game. The statue at the park or the surveillance cameras in the shopping street might suddenly be visible reminders of play (Sweeny & Patton, 2009). Making players more attentive to their environment is used in pervasive games that have a political or an artistic agenda, which is to disrupt conventions in public space through the use of "game imagery" (McGonigal, 2006). *Game imagery* covers elements that show they are a game. Doing this, pervasive games permeate the boundary between play and everyday life, allowing players

to explore urban identity, critique habitual behaviors, and seek to construct social structures (McGonigal, 2006). Thus, as a metaphor for their work in society, pervasive games create disruption through game-play, because they

> toy with cultural contexts, encouraging people in both playful and serious mindsets to interact. They challenge social codes and norms relating to public space and to what is accepted behavior in the public sphere. Finally, as they do this, they bring the thrill of the real into games and the fun of playing into ordinary life. (Stenros et al., 2007, p.36)

Pervasive games push and explore social codes and norms, which is part of the fun. As we have seen with *CitySneak* and *URAAY* – which both question surveillance – this can be done in LBGs, too.

LBGs have frames that are designed more or less explicitly. The frame can be understood in relation to design, as a psychological concept (Bateson, 2000), as a ritual performance (Copier, 2005), and a contract between designer and player (Montola et al., 2009). These frames can be blurred to increase ambiguity, which means that players need to negotiate the boundary of play through their participation within the frame of the game (Benford et al., 2006; Copier, 2005; Nieuwdorp, 2005). The frame of the game provides players with a premise with which they can interpret objects and events. Players learn to master these through play, and since LBG play takes place in the everyday world this might even last after the game. The frame of LBGs does not create a harsh separation of play from the ordinary world rather the players' actions permeate the boundary connecting play with ordinary. Still, through their actions players can create an intense meaning, which stands out from the ordinary due to its intense meaningfulness and coherence.

We have dealt with framing on a macro level considering the meaningfulness of actions, and the boundary between play and ordinary. Within the play, activity, objects and events are framed, indicating how to interpret them. Since LBGs are set in the ordinary world, it is particularly relevant to consider this framing of content as either fictional or authentic.

3.2.2.1 Fiction and Authenticity[10]

People have a "hunger for reality", they have had it with "virtual fake stuff" (Schell, 2010). It is a trend to blur the boundary between fiction and facts (Stenros et al., 2007). In LBGs, the tension between fiction and authenticity takes a particular form. The tension is concerned with the significance of content and events, and the actual consequence of in-game actions: Is the code that we are solving a result of the designer's imagination, or is this one of those codes that the Germans really used during World War II (Montola et al., 2009)? To understand the concept of authenticity, it is not enough to say that reality – or authenticity – is "that which is" (Bartle, 2003, p.1). We need to dig deeper to understand the relation between authenticity and fiction in relation to an object's meaning. Merleau-Ponty provides a definition of "real" in relation to fiction and meaning

> The real is distinguishable from our fictions, because in reality the significance encircles and permeates matter. Once a picture is torn up, we have in our hands nothing but pieces of daubed canvas. But if we break up a stone and then further break up the fragments, the pieces remaining are still pieces of stone. The real lends itself to unending exploration; it is inexhaustible. (Merleau-Ponty, 2002, p. 378)

The picture represents something, e.g., a landscape. Tearing it apart reveals the shallow significance of the landscape image. Torn into pieces, or subjected to a critical view, fiction cannot retain its significance. What is authentic or "real," on the other hand, retains its significance in form *and* content. The significance traverses the content. This is why stone is still stone, even after its shape has been broken. It is not the same stone; it does not hold the same properties, but it is still recognizable as stone. In this relation, a characteristic of "reality" is that there is no singular form (appearance) underlying all other forms, because reality "is the framework of relations with which all appearances tally" (Merleau-Ponty, 2002, p. 349). These relations are not lost when the stone is shattered. In addition, the stone remains the same regardless of whether I look at it on the ground or hold it close to my eye.

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[10] In the heading of this section, the term "authenticity" rather than "real" is used to make it clear that in this section we are not talking about reality as a philosophical term, rather about the authenticity of elements, actions, and tasks. Authenticity refers to something permeated by significance, independent of the perceiver, and which can resist exhaustive exploration. However, the scholars quoted here often uses the terms real or reality, and when referring to them, I use their terms. When using real and reality in this section, however, they relate to authenticity.

Although it looks different in size, it is not. The difference is created in my perception. The stone exists *in itself*, independent of me (or any other human being), which is also a prerequisite for something to be "real" (Merleau-Ponty, 2002). If the stone only existed and kept existing because of me, then it would not be authentic or "real" in Merleau-Ponty's sense. In short, something is *authentic* when its significance flows through its form and content, and when its framework of relationships remains true to its significance, no matter in which shape it is found. It remains being "the thing," although the form changes. An entity is considered authentic when it is independent of humans, namely, players or designers.

LBGs "blend what is real and what is representational, blurring game space and lived space" (Sweeny & Patton, 2009, p. 206). Thus, LBGs can convey location-based stories and experiences using authentic physical space and physical game content. Waern et al. (2009) have used the term *perceived authenticity* to describe this near-perfect representation. In LBGs, authentic events and elements occur that are not representations. When talking about fiction-authenticity, we are relating to a continuum of something clearly fabricated, i.e., perceived as fiction and dependent of the designer to something authentic (not being a reference). In between, we find "perceived authenticity."

According to Montola et al. (2009), using authenticity when telling a location-based story is a very powerful tool. Using Charles S. Peirce's three classes of signs in relation to how these games denote their object Montola et al. suggest three types of relation between real-world elements and their in-game significance: 1) indexical (the meaning is unchanged), 2) iconic (the element and in-game meaning are similar), and 3) symbolic (the meaning is conventional) (Montola et al., 2009). Using the properties of location (indexical relation) is less abstract than augmenting elements intrinsic to the environment (iconic relation), which again is less abstract than the conventional connection (symbolic relation). Letting a crossing signify a hole in the game (Kristiansen, 2009) is an example of an abstract symbolic relation between object and in-game significance. The more abstract, the more the players need to work on creating the connection (imagining it and remembering it). Thus the more abstract it is, the less authentic, as it depends on the players' creation to exist, i.e., they need to suspend their experience of the crossing and imagine it is a hole. Authentic content has an indexical relation to meaning. Here, by creation I refer to the effort put into creating a connection between element and game significance. Note that regardless of the structure, it is

characteristic for games that they depend on a player to forward the game-play and create (actualize) the game fiction (Arvidsson & Sandvik, 2007).

If the LBG is about experiencing a story instead of having players imagine a fictional world, in LBGs locations are augmented. Sandvik (2008) has defined *spatial augmentation*, and in this relation, he refers to Manovich's use of the term augmentation: places overlaid with dynamic data encoded with meaning (Manovich, 2006). When fiction augments place, it encodes the physical with traces of actions and events for people to interpret. Sandvik (2008) has proposed three ways that places are augmented through the use of mobile technologies: 1) "narrativization" is the process through which place corresponds to a scene for the performance of "true" stories. Letting people follow the footsteps of some actual person, e.g., Jack the Ripper, is an example of this. 2) "Fictionalization" is the process through which the actual place is working as a setting for fictions. Dan Brown's novels are an example of such location-based fiction that have turned Rome, Paris, and Washington D.C. into settings in which people can follow the protagonist Langdon's footsteps. Finally, the third type of augmentation concerns constructing a 3) "mixed reality." Here, place has the status of an actual location in the physical world *and* as a story space (Sandvik, 2008). The location is not constructed but augmented through the story and the use of technology. Players engage in the location by experiencing the story; they are not following the footsteps of someone else. This happens in *URAAY*, in which players are the protagonist of the game, experiencing it while playing. LBGs can be based on an authentic story and retrace it, or a well-known fictional account, or one created for the occasion. In any event, locations are augmented through story and technology, and the content can seem more or less authentic.

Not all LBGs concern themselves with experiencing a story. However, this does not mean that fiction is not present in these games. Players rely on the fictional frame to make sense of the setting, events, and objects encountered. Fiction also helps the player understand the rules of the game (Juul, 2005). This also means that when the designer of an LBG is trying to guide a player playing in the ordinary world, fiction can help.

Even when an LBG is not built as a tool for narrative involvement, the relation between fiction and authenticity is still present in these games in relation to the actions performed. The LBG designer also must consider which kinds of actions the player can perform and particularly consider the relation between meaning of the action and action as representation.

As the relation between game world and what it signifies can also be related to the semiotic categories (Montola et al., 2009), game actions can also be categorized as either indexical, iconic, or symbolic:

- *Indexical* relationship: Player action and game world action are directly related
- *Iconic* relationship: Player action and game world action are similar to each other
- *Symbolic* relationship: Player action and game world action is connected through contract or conventions

In pervasive games, actions are often indexical, as players can perform "authentic actions" like sneaking when the game requires sneaking. If a designer is going for a 360° immersion – a complete, fully immersive physical experience – the designer should aim for an indexical environment, indexical activity, and immersive role-playing (Montola et al., 2009; Waern et al., 2009). Being able to perform indexical actions is one of three aspects required to create a 360° illusion, which is

> a complete universe available to interact with, a situational, emotional, and physical realism in character immersion, and a what-you-see-is-what-you-get attitude to the physical environment of the game. I call this style the 360° illusion, in reference to the totality of both the physical game environment and the space for immersion it strives to create. (Koljonen, 2007, pp. 175-176)

If a designer strives for this kind of authenticity, besides offering indexical (or identical) actions (authentic activities), she should provide "*an environment perceived as authentic* which allows the participants to physically act in a near-perfect representation of the game world" and "the players 'emotionally and physically' *immersive role-play*" (Waern et al., 2009, p. 1550). The player is offered a role in the fiction – she can act (Arvidsson & Sandvik, 2007). Again, this supports narrative involvement. Another design strategy is to provide players with authentic challenges, as opposed to constructed challenges. Overcoming real challenges, such as climbing the wall or breaking original encryption used in the Second World War, is exciting for the player and lets him feel "I can do it" (Montola et al., 2009, p. 140). In LBGs, actions too can be authentic, however, often they are restricted to movement (Waern et al., 2009), although we do find examples of indexical actions, such as following a stranger (*URAAY*), and iconic actions, such as casting spells by making gestures (*REXplorer*). Still, in

LBGs, considerable interaction is often symbolic, e.g., a coin is picked up by being in the proximity of the digital coin (*Treasure*). Increasing the incidence of iconic and indexical actions can potentially raise the players' involvement in LBGs.

Therefore, designers of LBGs can aim for near-perfect representations using authentic environments, tasks, and interaction. In addition, they can play with making the framing and representations ambiguous to keep players on their toes and engaged in their creating meaning through play.

3.2.2.2 Uncertainty and Ambiguity

In LBGs, part of the excitement relates to the uncertainty of what belongs to the game world and what belongs to the ordinary world (de Lange, 2009). Game actions in the LBG are not necessarily finite, as players can often use different resources outside the game environment. This uncertainty and ambiguity has been noted as a central element of locative play by several scholars (Benford et al., 2003; Benford et al., 2006; Dansey, 2008; Gaver et al., 2003; Mäyrä & Lankoski, 2009). Gaver et al. (2003) argue that making the game ambiguous and thus hindering a straightforward interpretation of objects and events, means that players are challenged to participate connecting these to the game and thereby creating meaning. They present three areas that can be ambiguous: context, relationship, and information (Gaver et al., 2003).

An *ambiguous context* finds its source in the sociocultural discourses used to interpret events (Gaver et al., 2003). Since we use context to understand what is going on and how to act meaningfully in a game (Borries et al., 2007a; Ermi & Mäyrä, 2005a), making context ambiguous can give way to surprises and excitement. As an example of play with ambiguous context, Gaver et al. mention Duchamp's Fountain, a urinal turned on its side. Placing the urinal in an art exhibition means that its interpretation is no longer straightforward: Clearly, it is not just a urinal anymore, or is it? Similarly, LBGs can disrupt players' understandings of the meaning of events by placing them in a context that makes interpretation of or acting on them difficult. We see one such example in *Tombstone Hold 'Em Up*, which was played on a graveyard wherein the tombstones represented either spades, heart, clubs, or diamonds depending on the shape of the stone (McGonigal, 2007a). In this game, the context does not invite people to play; however, the game is set here and breaking the taboo of playing in a graveyard can bring excitement into play. The LBGs *CYSMN*, *Treasure*, and *Fruit Farmer* are

not bound to a particular context, and thus players can choose to play them in places that potentially create an ambiguity of context – such as a shopping street. Context can be enhanced by implicating incompatible contexts to disrupt preconceptions (introducing a graveyard as a scene for play), adding incongruous functions to breach existing genres (racing for a book at a library), and blocking expected functionality to comment on familiar products (tilting the urinal, rendering it unusable for its original purpose) (Gaver et al., 2003).

Ambiguous context encompasses an unclear relationship between game meaning and the context. On the other hand, *ambiguous relationship* is concerned with how the player relates to elements, activities, and situations. An ambiguous relationship encourages the user to

> imagine how we might personally use such products, and what our lives would be like in consequence. As a result of this speculation, we form intellectual, aesthetic, emotional, and moral judgements that can become available for self-reflection. (Gaver et al., 2003, p. 5)

An LBG that promotes ambiguous relationship makes players relate to something that they have not related to on a personal level and do not know how to interpret. When we do relate to it, this reflection is of a sort that forces us to reflect on ourselves. An example from an LBG is *URAAY* that invites players to consider whether they would support a stranger with a personal problem within the next 12 months or even to make contact, as those who accept are sent the contact information for each other and can get in touch (Montola et al., 2009). Here, players must reflect upon, e.g., their own willingness to help, privacy, and courage. Again, they are put in a position in which making a choice is not straightforward, and involves not knowing how to interpret it within and outside of the frame.

Ambiguity of relationship can be enhanced by pointing out things without explaining why – e.g., asking players of *URAAY* to follow a person in a white tee-shirt. Since players do not know the premise, they cannot know the consequences of the choice nor how to relate to it personally. Finally, relationship ambiguity can be increased by introducing disturbing side effects to question responsibility; toying with "the balance of desire and ethics can be provoked by designs that seem immediately appealing but which have disquieting implications" (Gaver et al., 2003, p. 7). Again, following a person as in *URAAY* who is not aware of being followed is an example of this, since players want to know what will happen if

they do; yet on the other side, if they suspect that they are involving a stranger in their game, being afraid of the consequences might make them consider against it.

We can find ambiguity in relation to context and the choices made in the LBG. Finally, designers can choose to present ambiguous information to players. *Ambiguous information* arises in the way that information is presented (Gaver et al., 2003). The ambiguity of information can be enhanced by using imprecise representations to emphasize uncertainty, expose inconsistencies to create a space of interpretation, and cast doubt on sources to provoke independent assessment (Gaver et al., 2003). For example, by presenting players with information about a runner's position in *CYSMN*, the players learn that this information might not be trustworthy. Further, the information presented through the interface of LBGs is often ambiguous due to instability of location-aware devices. This ambiguity in relation to interface is discussed more thoroughly in the next section on interfaces, as we go through seamful design. This is a kind of ambiguity that was used by players of *CYSMN* to devise strategies that play on the uncertainty of representation.

In this section on the structure of LBGs, we have observed how LBGs straddle the threshold between play and ordinary, and fiction and authenticity. In the previous section on spatiality, we learned how LBGs combine digital and physical media. These six dimensions are not opposites, although we need to understand them separately to consciously employ them in LBG design. Now that we have covered all six dimensions, we will move on to the model: Boundaries of LBGs:

Physical media
- Relation to location
- Experiential aspect
- Metaphorical aspect
- Structural aspect
- Social aspect
- Spatial features

Ordinary
- Horizons of time and space
- Harm can happen
- Actions have consequences
- Patterns of perception

Authenticity
- Significance encircles and permeates matter
- Exhaustive exploration
- Significance independent' of designer and player
- Indexical actions
- Authentic challenges and environments

Interface

- Pleasure/excitement
- Players feel safe
- References are changed
- Meaningful
- Continues shifts between frames
- Attitude toward the world
- Connect worlds
- Movement/actions

Play

Fiction
- Separate from the authentic world
- Attention to imaginative world
- Tells a story or guides
- Depend on player/designer

- Coded game-space
- Reveal and hide content
- Combine external world and body
- Expand reach/abitilies

Digital media

Figure 23: Boundaries of LBGs

Note that when illustrating physical and digital media opposite of each other in the sphere, the intend is not to renounce that digital and physical spaces are not *experienced* as separate, despite their being distinct entities in the *design* process. Physical and digital media are different in terms of design, although not always experienced as separate entities. In addition, the other two distinctions should not be understood as harsh separations either, since the boundaries between them are not clear.

This model and its usefulness will be developed and discussed further in the dissertation. Interacting with these boundaries is made possible through the interface, which is the topic of the next section.

3.3 Interfaces

Players of LBGs experience their surroundings through patterns that affect their perception. These patterns are a mixture of technological operations, frames, game rules, and the LBG's narrative, as well as cultural norms that affect the players' experience of the visited locations. These patterns or filters we can term the interface of LBGs. Interfaces affect our experience of the spaces we inhabit, as well as the interaction with the people to whom we connect (de Souza e Silva, 2006). Usually, when we discuss interfaces, we are concerned with the big screen at home, the joystick, the keyboard, the computer mouse, etc. Yet when it comes to LBGs, the interface goes beyond what is traditionally regarded as such since it encompasses physical locations too. What is an interface? De Souza e Silva offers this description: "Interfaces are defined as communication mediators, representing information between two parts, making them meaningful to one another" ((Lévy, 1993; Johnson, 1997) quoted in de Souza e Silva, 2006, p. 261).

Often the term interface is connected to computation. But it does not have to be so, as this definition shows. The parts information is represented between can be a computer and a person, between two computers, between two people, etc. The interface is the mediator that represents and translates information into something meaningful. In LBGs, the interface is: "the even larger space of the city and the player's body using their actions as a means of controlling the game" (Kristiansen, 2009, p. 14). The communication mediators in the LBGs presented in this dissertation encompass location-aware technology, physical objects, and even players. There are also examples of using traditional media, such as a phone (*URAAY*), PCs (*Frequency 1550* and *Visions of Sara*), and maps (*REXplorer* and *Land of Possibilities?*). These traditional interfaces are not particular for LBGs, and thus they will not be discussed further here. In this section, the technical interface in LBGs – *location-aware devices* – are examined. In this connection, *seamful design* and other strategies of interfacing, i.e., translating between two parts, are discussed. The strategies encompass hiding, removing, and exploiting the "loss in translation" that occurs in LBG interfaces. Finally, we will relate to how LBGs and *players* of

these games interface with *objects* in the everyday environment. The interfaces of LBGs connect the game with locations, and thus they are a central part of LBGs.

3.3.1 Location-aware Devices

Location-aware technologies make it possible to build systems that can localize users. This means that designers can deliver and collect data from players in physical space at particular positions or at particular types of locations and track the players' movements. LBGs often use existing Wi-Fi and/or GSM infrastructure for communication and GPS for location determination (Broll, Ohlenburg, Lindt, Herbst, & Braun, 2006). Players of LBGs are equipped with portable digital technologies as interfaces between physical and digital space. Players of *BotFighters*, *CitySneak*, *Feeding Yoshi*, *Frequency 1550*, *Treasure*, *Land of Possibilities?*, *Fruit Farmer*, *Ghost Patrol*, and *Foursquare* are equipped with mobile phones (although in *Frequency 1550*, half the team is sitting indoors at a computer with Internet access). In *CYSMN*, *REXplorer*, and *Spy in the City*, players are equipped with portable devices customized for the game. Street players of *URAAY* have handheld computers with which they can indicate their own position. Players of *CatchBob!* carry a tablet PC using Wi-Fi to position players. Finally, street players of *Visions of Sara* have a highly sensitive GPS unit in their pockets for positioning and use a simple mobile phone to communicate with headquarters.

There is a growing tendency of embedding GPS technology in mobile phones, expanding their use from two-way communication and Internet browsing to localizing users and services. Another noteworthy development of mobile phones is opening up for a broader circle of developers. Location-based services have had low accessibility

> primarily because of delays in opening the location-aware application program interface (API) in cell phones, but also partly due to privacy issues and [a] lag in bandwidth, for almost a decade these types of location-aware projects have belonged to the experimental domain of art, research and games. However, in 2008 the release of the GPS-enabled iPhone 3G, Google's Android operating system, and their accompanying authoring interface contributed to the popularization and commercialization of location-aware applications. (de Souza e Silva & Frith, 2010, p. 486)

This development increases the number of LBGs that are available to players, since location-aware technologies are used as interfaces in LBGs, with the position of players a defining factor for LBGs (de Lange, 2009).

In LBGs, movement in physical space is intrinsically connected to the players' performance in the game. LBGs are played in everyday spaces as the primary play-space (de Souza e Silva & Sutko, 2009). This is possible due to location-aware technologies: They track us, localize people and things, make it possible for us to connect to locations even after we have left them, and thus to set our traces. Location-aware technologies also support different ways of moving in space, as they are used for navigation. Thus, these technologies support the notion that places are not fixed but dynamic nodes that are continuously written and read (de Certeau, 1988; de Lange, 2009; Massey, 1993; Meyrowitz, 2005). De Lange (2009) argues that the form and content of our experience of place changes with location-aware technologies. Previously ours has been a largely visual culture capturing spatial experiences through, e.g., holiday photos and postcards, which we then share. With location-aware technologies, we can share what we are experiencing now on a map and invite others to participate. We do not try to capture the essence of a place with locative-media or use the place to be social; rather, we use the social to experience place (de Lange, 2009). Location-aware technologies are not only related to experiencing a location, they also enable sharing it and seeing it through other perspectives. With locative-media, users explore the physical and digital world in conjunct. Users do not distinguish between them, and thus: "Locative media make it possible to intervene in what constitutes a place by questioning its boundaries" (de Lange, 2009, p. 66).

LBGs provide the opportunity of sharing localized information with others, often via mobile phones. Mobile phones are related to private use. Most of the time, users communicate with their network via the mobile phone. In addition, the activities performed via the mobile phone are not accessible to people in the surroundings. Due to these conditions, mobile phones can solidify and strengthen existing networks, while excluding others from the existing networks, creating cliques (Xiong et al., 2009). This means that designers must be conscious about how their games enable players to interact with other people and, specifically, with whom.

Mobile phones are personal devices that we carry around most of the time. This means that it is possible to monitor, e.g., a player's movements, locations visited, and proximity of other

players. People use this function to monitor themselves, e.g., tracking their exercise, the amount of calories burned, or the places they visit. I call this *self-monitoring.* This is known in exercise applications, such as the sports tracking application *Endomondo* (2008), that show the trajectory of the user when he is using the application. As smart phones integrate even more sensors, it is possible to track even more aspects of our activities – such as acceleration, heart rate, sweat produced, fluid balance, temperature, etc. Technologies turn not only space as Manovich (2006) describes it, but also our actions and bodies into data space. A challenge for LBG designers in the future will be to use this data flow as a design material, to represent it meaningfully to players, and to form politics and poetics in relation to it.

Location-aware technologies are critical elements for the design of LBGs, since tracking locations, distributing information, and tracking the movement of players is intrinsic to LBGs. The data retrieved from and delivered to space need to be represented for the users. However, sometimes losses in translation occur, as the seams between systems show.

3.3.1.1 Seams

Due to some instability of location-aware technology, there is often a discrepancy between digital information and the physical environment (Benford et al., 2003). For example, the represented position of a player or action spot can be different from the actual position, causing uncertainty. This constitutes ambiguity of information (Gaver et al., 2003), since players cannot trust the information they receive. It is a result of a "*seam,*" which "is a break, gap or 'loss in translation' in a number of tools or media, designed for use together as a uniformly and unproblematically experienced whole" (Barkhuus et al., 2005, p. 359).

Seams often appear when different digital systems are woven together in our everyday environment (Barkhuus et al., 2005). An example of the systems that need to interface is the GPS unit that communicates with satellites, the Internet, and an application running on the player's phone. If there is a loss somewhere among these systems, the position of players or information might be wrong. Players respond differently to these losses in translation. In a test of the LBG *CatchBob!*, researchers noticed three types of reactions: The first reaction is to believe the system, but acknowledge that it is wrong. The second reaction is not understanding what the representation means. Finally, the third reaction is to not trust the system (Nova & Girardin, 2009). When there is a discrepancy between digital information and physical environment, the media themselves can be seen as social actors, i.e., "people

treat media as if they were 'real' people and 'real' environments, taking for granted that which a given medium conveys." (Walz, 2010, p. 25). We generally trust what is represented to us through the interface. When we experience errors, however, the issue is a matter of how the display corresponds with reality (Gaver et al., 2003). This ambiguity does not have to relate to errors in data. It can also be because things are understood in different contexts, each suggesting different meanings (Gaver et al., 2003). For instance, if a player's representation disappears from the map, does that mean that he has lost connection or that he was expelled from the game for some reason?

There are at least three strategies related to dealing with uncertainty in relation to seams: 1) trying to *remove* the losses in translation by improving the system, 2) *hiding* errors, or 3) *revealing* that they occur so that players can make use of this knowledge (Benford et al., 2003). In LBGs, all three strategies to handle seams can be used (Benford et al., 2003). Both hiding and revealing seams were tested as strategies in *CYSMN* (Benford et al., 2003). Hiding errors allows players to "weave their own interpretations of technical quirks into the game experience" (Benford et al., 2003, p. 39). Players can then maintain a willing suspension of disbelief without compromising their engagement with the game (Benford et al., 2003). Revealing "quirks" as areas in which the satellite connection was bad gave *CYSMN* runners a greater ability to deal with uncertainties themselves and even to use the knowledge strategically (Benford et al., 2003). They ran into areas with low coverage and lay in wait, lurking, so that online players did not know exactly where they were; in this way they could "ambush" online players.

There is still instability in relation to the use of location-aware technologies; therefore, the discussion of how to deal with this is relevant in relation to LBG design. According to Chalmers et al. (2003), we can actually use technical flaws in our designs. By letting users play with the seams they become aware of them and can use them strategically, as shown above. This approach is called *seamful design* (Chalmers et al., 2003). In Chapter 2 two examples of seamfully designed LBGs where presented: *Treasure* (Barkhuus et al., 2005; Chalmers et al., 2005) and *Feeding Yoshi* (Bell et al., 2006). In both games the wireless network of a city and its instability becomes part of the game-play.

Seamful design is not better than seamless design, but it is an opportunity that one might consider. Waern et al. argue that seamful design

is very beneficial for technology in games that strive for a 360° illusion. In seamful design, the design exposes the inner workings and limitations of a technology to its users and uses this as a design resource rather than as a problem to overcome. The reason why it is particularly useful in games that aim for a 360° illusion is that in these games, the game continues to run even when the technology fails. (Waern et al., 2009, p. 1555)

LBGs are not about technology. Technology is a tool, yet attention should be directed not toward the tool but rather toward the player's environment, the game's challenges, and if there is one, the game's story. However, as stated in the quote understanding the tool can make it easier for players to deal with breakdowns and to act without help. This means that though players should not pay attention to the tool, they should still know the tool and its workings which is a central part of seamful design (Chalmers et al., 2003).

When designing LBG play-space, it is important to balance how much attention the player needs to spend on technology (typically a screen) and how much attention the surroundings need. If the player interacts only with either the computer or the landscape, the belief in the story environments can be severed (Gustafsson et al., 2006) and, in general, attention can be pulled away from those elements toward which the LBG wants to guide the players' focus. Thus, we should develop user interaction experiences that provide for a *blended focus of attention* (Gustafsson et al., 2006). The experience should be affected by the interface (whether or not conveyed by a computer); conversely, the experience should not be all about the interface. The game must draw the players' attention to the location, the body, or the story and involve this in game-play as well. The aim is to create a situation whereby the LBG affects the player's experience of the physical surroundings.

The examples above relate to our uncertainty with the way the technology performs; however, seamful design can also concern itself with ways to approach an unstable environment. Doing both, Nova and Girardin (2009) suggest considering risks and turning them into advantages for the designer. The authors propose two ways to work with space in LBGs: Either create a controlled and constrained environment or acknowledge that the world is messy and deal with that (Nova & Girardin, 2009). Out of the games presented in this dissertation only *Land of Possibilities?* is created in a more controlled environment, since it is located at the Open Air Museum in Brede, Denmark. Because LBGs do depend on

features of our messy world, such as networks and environments that change, this "messy world" approach to designing interfaces will apply for most LBGs. Accepting that the environment is unstable means preparing for "worst case" scenarios; e.g., if a statue or digital information suddenly goes missing, players ought to be able to continue the game. This makes Reid's design for coincidences relevant, for designers cannot be certain whether someone with a white tee-shirt will come near the player, when the LBG refers to this, as is the case in *URAAY*.

Designers decide how to deal with instability in relation to interface and environment – whether the instability should be a part of play rather than a nuisance, or whether it should be hidden. Next, we will relate to objects and players as communication mediators, i.e., interfaces in LBGs. Two entities out of the designer's full control and thus part of the "messy world".

3.3.2 Objects and Players

Players transfer game significance onto their surroundings, by the use of their imagination and through their actions. These actions can also entail handling physical objects. Objects in the everyday world can be part of the interface, and players can perform indexical actions with these objects, as we have seen. However, players do not always know which of these actions are recognized by the LBG. Dourish (2004) points to two issues in relation to tangible interaction, and he adds that it accounts for context-based computing as well. This is relevant for LBGs, since computation is distributed in LBGs, meaning that not all processes are performed in a controlled (digital) environment. The two issues are (Dourish, 2004, pp.50-51):

- There is no single entry point of control; there are multiple points
- The sequential nature of the interface is transformed when computation is distributed in an environment

We do not exert the same control with user actions in tangible computing as is found when we interact with a PC. To deal with these problems, we need to rethink the philosophical background for computer science, which is based on a pre-1930s philosophy that represented an idea of a disembodied rationality (Dourish, 2004). Dourish suggests adapting the thinking of Merleau-Ponty to computer science by introducing the concept of situated

agents who are bodily *in* the world acting and interacting with that world. Computers have developed tremendously regarding power, memory, and performance; yet all the while, the interface has changed little. The disembodied rationality does not regard the needs of the user, and therefore after a few decades, we still physically interact with PCs in the same way, by sitting at a desk, watching the screen, typing on the keyboard, and clicking the mouse (Dourish, 2004).[11] This is changing with the emergence of mobile devices that we carry around and from which we expect to receive information when and where we need it. This shift from traditional interaction to new interfaces and new forms of interactions is relevant when it comes to LBGs, as they are based on distributed computation, information, or services. Thus, LBG designers must incorporate the two issues highlighted by Dourish: not having a single point of entry and interaction forced into sequences.

The first of the two issues concerns the distributed interface; namely, there is no single entry point of control: no single point of interaction, as the games are played on different connected devices that are moved around in an environment. These devices range from mobile phones to sensors and actuators augmenting the surroundings. In a traditional interactive system, such as the one used in PC and console games, only one window has the "focus" at a given time, and the cursor only has one location, which is where the user's action will be carried out. The issue at hand, when computation is distributed, is that it is difficult to predict where the action will occur. The difference is that in traditional computing, the user must show the computer where he is focusing attention, e.g., moving the mouse, clicking the window that needs to be activated. In LBGs, however, the system does not know where the attention of the player is and sometimes not even where the next activity will take place. Designers can choose to restrict interaction to a controlled interface, e.g., to a portable device, but they can also allow players to perform indexical action with real objects and try to incorporate this in the game. For instance, the LBG designer might need to consider how the game will "know" that the players have danced on a meadow if that is part of the game-play. One option is to allow LBG players to document and judge indexical actions, as is done in *Frequency 1550*, in which players perform scenes in the streets and document it. In this way, players can be part of the interface, too.

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[11] Note that the metaphors used in communicating how to control the operating system and how to use the software are part of the interface, too, as is the language of the mouse, scrollbars, etc. This has changed considerably since the first computers were introduced.

The second issue of leaving the centralized interface is that the interaction transforms the sequential nature of interaction at the interface (Dourish, 2004). In traditional interactive systems, users often must do things in a certain sequence in order for the computer to "understand" the action. This sequence is not always the most logical way to approach the task being done; nonetheless, we need to adjust to the system to perform the task. Imagine a trivial task such as filling out a web form: first, data are entered, a button is clicked to submit, and then a check is performed by the system to determine whether the provided data have been given. If data are missing, or if it is not entered in the proper form, an error message will appear. If so, the user must edit the data before clicking again, and repeat the sequence. Although it is possible in LBGs to demand a sequential interaction that requires that the player do things in a certain chronological order, it is less natural and can prove to be difficult to understand for the player or simply disrupt the experience. The challenge, when the structure is not sequential but parallel, is that the system does not "know" what I am about to do next. This problem is known in computer games that allow the player to move freely in the game world. But in a digital world, it is possible to hide and reveal content (Hayles, 2004) – e.g., the player cannot enter a certain door before a key is obtained and this requires fulfilling a certain quest that introduces skills acquired or a plot twist. When designers send the players out onto the streets of a town, these restraints grow fuzzier: e.g., the LBG players can enter a building if it is unlocked, although they are not supposed to do so. The more the players can interact physically with the environment, the more pronounced the two issues will be, as the interaction with artifacts does not have one entry point and it is not structured sequentially.

Dourish (2004) suggests addressing the issues through designing physical properties that imply the possible actions for an agent, i.e., their affordances. Such design can even guide the action into a sequential process. The design guides the user by suggesting possible actions through the physical form. Most LBGs do not encompass the design of physical objects or are even limited to using certain objects. When they do not, the designer must provide players with cues of possible actions e.g., using the display of game-state, the narrative, and the possibility of unlocking information with "keys". Another way is for the designer to incorporate that in some types of games, the player has "infinite affordances," as any object can be used (Waern et al., 2009). This second option is a central attraction for pervasive games – and can be for LBGs as well; "the world is a vast and infinite changing resource of

content" for the game (Bichard & Waern, 2008, p.10), which can increase the players experience of realism – as if the game is authentic rather than constructed.

Another possibility is to rely less on computation and to involve the player more in interfacing between LBG and the everyday world. In Section 3.1.4, "Locations as Play-Spaces", we saw the LBG provide a frame that can connect locations, objects, events, and actions meaningfully to the game even when none exists, and that can be enhanced through design for coincidence (Reid, 2008), or apophenia, which is when players connect two unrelated things (Dansey, 2008), or by relating on a symbolic, iconic, or indexical relationship between real and fictional meaning of these elements (Montola et al., 2009). With coincidence and apophenia, the designer relies heavily on the player's ability to interface between object and game; i.e., it is the player who acts as a mediator assigning sometimes-random objects meaning in the game. The designers can promote this by integrating ambiguity into the design (Dansey, 2008). However, designers must continue to depend on the players interfacing the objects. Regardless of what designers have anticipated and planned, the true meaning of an interface is created through user practices (de Souza e Silva, 2006).

The player's performance is a part of the intermediation between everyday life and LBGs, and it is the players who accept and project the rules of the LBG into everyday space. Nieuwdorp (2005) claims that in every pervasive game, the player must shift focus from the everyday world to the conventions and rules of the game he/she has entered. This is also relevant for LBGs, as they offer patterns that affect the perception of and interaction with the surroundings. Players adopt a lusory attitude that allows them to accept the rules and thereby mediates the shift between the everyday world and the game world. This means that it does not have to be only the software of the LBG that represents information to the player and translates players' actions, so that it is meaningful to the system. The player translates the game information onto the environment, making it meaningful in this context as well. Thus, the player is interfacing between the LBG and the environment (Nieuwdorp, 2005).

When the player approaches the world, ordinary objects might not have the same meaning that they normally do, e.g., a tombstone becomes a key that helps decipher a secret code (Ballagas et al., 2007). The relationship between an object and its accepted conventional meaning that has been constructed in a specific cultural discourse is changed by the player

(Nieuwdorp, 2005). Through play, things in the domain of the everyday world gain new life in the game world. Nieuwdorp calls this dynamic process a *liminal interface* located in the mind of the player. This liminal interface handles the semiotic switch between the "life-world" domain, and that of the pervasive game (Nieuwdorp, 2005). She subdivides the liminal interface into two new terms (processes): "*paratelic interface*" and "*paraludic interface.*" The paratelic interface applies to leaving behind the conventions of the life-world domain, e.g., forget that this object is actually a tombstone. The paraludic interface, on the other hand, allows the player to accept the new conventions (rules) that exist in the domain of the game world (Nieuwdorp, 2005), e.g., accepting that someone left this stone as a key to decipher a code. The player must suspend her disbelief in the game universe, disregard prior knowledge about an object of the life world, and imagine a new meaning for it. Players shift between realities or frames (Bateson, 2000). The player's actions are part of the intermediation between original meaning and fiction in LBGs as well. According to Nieuwdorp through *playing* (play-mode) we are able to disregard the laws of the ordinary; through *gaming* (game-mode) we are able to accept and internalize the game patterns that enable us to experience the surroundings "through the game." The player is a communicative mediator who applies his or her interpretation of the game fiction and rules to the ordinary world (in some cases including bystanders and other players).

This dissertation argues that the liminal interface is not only located in the mind of the player, as Nieuwdorp (2005) suggests. It is incorporated into the player's body and affects both perception and interpretation. Let us have a closer look at how we can perceive our surroundings through interfaces. Consider a blind man who uses a stick to navigate and sense space. The blind man relies on the stick and his hearing as he navigates space. As he gets used to the stick, it is no longer an object for him; it becomes his extended body. He does not sense objects *through* the stick, because he does not focus on the stick. He uses it to identify obstacles on his way. As he becomes accustomed to the stick he does not notice it anymore; he then actually senses the stick through these objects (Merleau-Ponty, 2002). The stick is incorporated into his perceptual apparatus. If we play a sport or console game over a *significant* amount of time, we might experience something similar though temporally: We forget the tool in our hands, because we are used to it and instead focus on what we are doing with the tool, it is incorporated, or we perceive the ordinary world through the perspective of the game, e.g., looking out for cool cars after hours of playing *Grand Theft Auto* (Rockstar, 2008). Perception – and interpretation – is affected by the pattern the game

represents. By repeating the process of disregarding (most of) the rules and significance of the ordinary and applying the ambience of the LBG, the player might come to a state wherein the logic of the game becomes intrinsic and thus being able to connect the LBG to elements not intentionally included in the game – experience apophenia (Dansey, 2008). McGonigal has even argued that such a state can extend beyond a game, so that the player experiences a "gaming reality" applying methods and perspectives from the game to everyday life (McGonigal, 2003a). With LBGs, it might be that players grow more aware of certain aspects of space (how positioning technology works between buildings, the frequency of surveillance cameras, the relation between a city and its history, etc.). Designers can direct the *attention* of players through the LBG toward certain features of everyday reality, such as the power structure, and the legitimacy of space. Designers can also draw the players' attention away from the ordinary world toward a fictional world that comes to life between the cracks of the ordinary, or toward the players' bodily sense of space, and of the body itself. As such, LBGs can function as tools, provoking our experience of space and of experiencing our bodies. They work as liminal interfaces between the mind and body of the player and the surrounding world. This argument is expanded further throughout the dissertation.

The interfaces of LBGs are fresh and continue to be defined through players' appropriation. They materialize patterns that affect our actions in, interpretation of, and perception of our everyday world. They should be designed for this messy world with all the richness it affords.

The LBG experience is created by players in interaction with their environment – not by designers. By involving the player in "interfacing" between play and ordinary, the player co-creates the game in the ordinary world.

3.4 Player Experiences

Players craft experiences playing an LBG. It is through their practices – their choices and actions – that the possibilities made relevant by the LBG structure are actualized. Players make their choices based on their *motivation*. In LBGs, *mobility* and *actions* is central, as players move between locations and act out the LBG. Through this movement and their actions, players create *meaningful play* in the LBG. Players' experiences are made out of repeated meaningful actions – since play is intense meaningfulness. What is meaningful depends on the kind of excitement players are aiming, the context and what the LBG frame as

meaningful. Finally, it is discussed how a highly meaningful experience in LBGs should be understood as *flow*, *immersion*, or *incorporation*.

In Section 3.2.2 we discussed frames and the magic circle. In this relation, we saw the importance of the boundaries between play and ordinary, as well as how certain elements and locations are to be interpreted. It was concerned with meaning – play standing out from the everyday due to its meaningfulness, with elements interpreted premised on their providing meaning in relation to the game. Yet what is meaningful in the game to players? This relates not only to the designed frame, but also to the motivation of players.

3.4.1 Motivation

Games are performative (Arvidsson & Sandvik, 2007; Copier, 2005), as they demand action from players, and therefore it is vital to comprehend the concept of motivation in order to understand what drives these actions. We play games because doing so leads to pleasant excitement, and although it can lead to frustration, the purpose of playing games is the action itself (Ermi & Mäyrä, 2005a). Often frustration in games is related to progress being impeded, which is sometimes necessary to heighten the overall experience (Gilleade & Dix, 2004), as rules prevent the more efficient means of reaching a goal. Thus, we must remember that more emotions are present in games than "fun" alone.

Games offer objectives that the players can pursue, and while, eventually, most players want to reach the goal, the time spent playing is not necessarily considered wasted if they do not succeed (Apter, 1989). Players move between two motivational states – one in which arousal is felt when progress is achieved and one in which engaging in the process is experienced as desirable. The motivational states also affect players' behavior in space, as we shall see.

In order to understand motivation, there are three elements to uncover. A motivated player has (Apter, 1989, p.6):

- A sense of the level of arousal
- An idea of a goal for which one could strive
- A sense of the possible means to an end

Arousal is a measure of how much excitement or emotion a person feels at a given time. The level of arousal is related to the "hedonic tone" that covers how much or how little pleasure a person takes in a situation (Apter, 1989). These two axes are illustrated below:
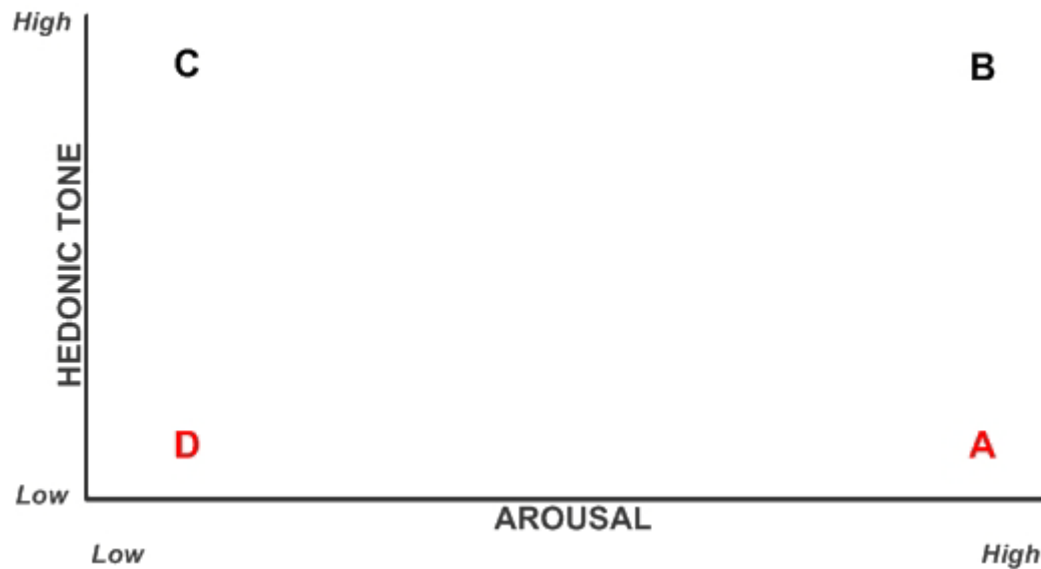
Figure 24: Arousal and hedonic tone.

Apter assumes that people seek pleasure (high hedonic tone); this means that we will strive for states B and C. States A and D, on the other hand, are unpleasant and thus undesirable. A person in state A is very excited, which is experienced as being unpleasant. The person will therefore move toward state C, where arousal is reduced. On the other hand, a person who is in state D, experiencing an unpleasant low arousal, will seek satisfaction by increasing the arousal, bringing this person closer to state B.

These two movements toward or away from high arousal are modes motivating a person's actions through regulation of arousal levels. The first mode describes a condition in which the person wants to avoid high arousal, the *telic* mode. A person in telic mode is directed toward the future and his/her actions often relate to planning, assessing, and evaluating (Apter, 1989). The telic mode is the goal-oriented and serious approach (Apter, 1989). The second mode, the *paratelic* mode, is the state in which the person will want to move toward higher arousal (Apter, 1989). The paratelic mode is the process-oriented and playful approach. A person in the paratelic mode is focusing at the past and present. This person is spontaneous and flexible, willing to experiment, to play around, to fantasize, and to make believe. These two modes are added to the graph:
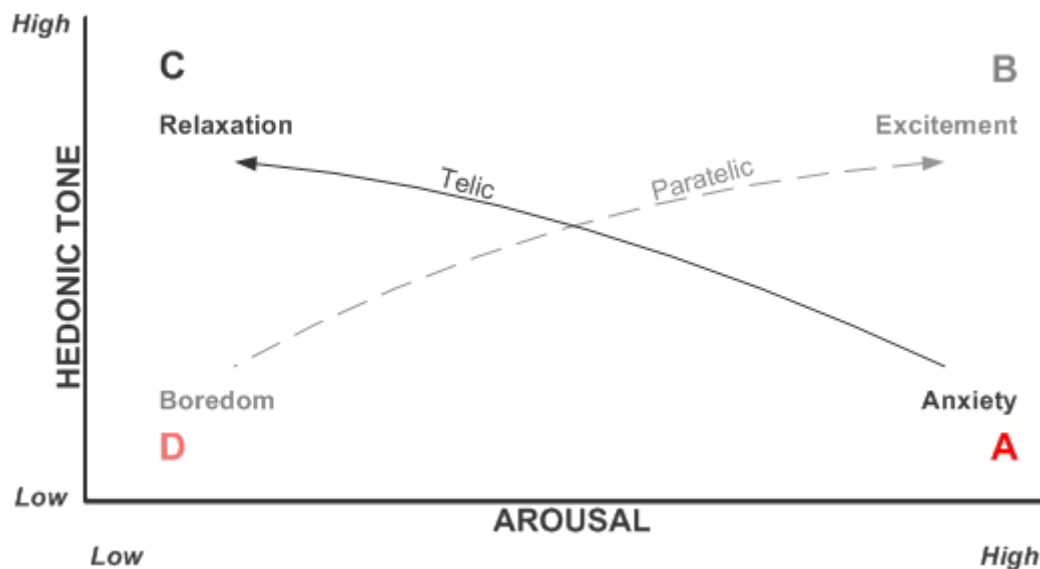
Figure 25: Arousal and hedonic tone with moods and modes.

The four states are emotional states. In situation A, the person feels *anxiety* (high arousal, low pleasure). This person will try to lower the level arousal to reach state C: *relaxation* (low arousal, high pleasure). The person in situation D is *bored* (low arousal, low pleasure) and aims at state B: *excitement* (high arousal, high pleasure) (Apter, 1989). Apter sees these concepts as binary opposites, wherein anxiety/relaxation are diametrical opposites, as are boredom/excitement. These are all feelings that we can go through while playing a game.

The two modes are meta-motivating. Meta-motivation is the function that specifies what the person wants: high or low arousal. Motivation, on the other hand, is regulation of a person's mood. The motivation helps the person to reach and stay within the range set by meta-motivation (Apter, 1989). For example, if a player is bored and therefore desires a high level of arousal, then motivation is what gives her the urge to play an LBG if this particular activity makes her excited and thus raises the level of arousal. However, after playing the game for a while, the player might be frustrated, because she cannot reach the next location. Her meta-motivation might then change and now she aims for a more relaxed state.

Players shift between telic and paratelic mode when playing LBGs. They plan actions and then they improvise, experiment, and make believe. This is what happens with games in general, as they provide players with goals and possibilities to experiment and plan on getting closer to the goal. These two modes are relevant to LBG play as well as understanding behavior in play in general. However, linking the two modes to behavior in space makes it even more relevant for LBGs. According to Walther (2007c), in games there are two modes,

where a) is game-mode and b) is play-mode. Game-mode is related to *ludus*, the rule-bound, goal-oriented approach, and thus to telic meta-motivation. Play-mode is related to *paideia*, related to improvisation and process orientation and thus to the paratelic meta-motivation. Together, they form the term *game-play* (Walther, 2007c). Game-play is free movement within a rigid system (Salen & Zimmerman, 2004), i.e., within the games structure. It is going for excitement while accepting the rules and adopting the frame. The type of free movements that create excitement depends on the structure and thus we can speak about types of game-play, i.e., different ways to play the game. In play-mode, the player "does not want to fall back into reality" and the player seeks pleasure through an exciting process. In game mode, what is desirable is to climb to the next level and focus on the structure of the game (Walther, 2007b). Game-play is a tension between these two motivational states, relating to relevant means available (that can be used to raise arousal and to form strategies), the player's sense of arousal and desire to pursuit the game's goal.

Relative to LBGs, it is interesting that Walther relates the two modes to spatiality: To play-space and game-space (first introduced on page 62). When in game-mode, we are focused at moving and advancing in space relating to regulative rules and the goal of the game. In play-mode, we focus on the process of mapping a place through adventurous discovery (Walther, 2007b). Players of LBGs shift between moving and advancing, and mapping and discovering. For example, in *Treasure* players shift between mapping the location of coins (play-mode) and planning how to get to the coins, advancing in space (game-mode).

While playing games, we constantly shift between paratelic and telic modes – we shift between play-mode and game-mode. We engage in the process of the game at one moment and the next we are negotiating rules and frames. These shifts are central in LBGs, because the negotiation of frames is prominent in these games that are played in the ordinary world. There can be conflicts between these play-mode and game-mode, as the free movement can be interrupted by other conditions than the LBGs structure, e.g., laws, norms or people that somehow affect play (Walther, 2007c).

The meta-motivational state defines what the player will be motivated to do, whereas the LBG should frame possibilities that are relevant in order to reach arousal. Apart from having a sense of the level of arousal and of a goal, having a sense of a means to an end is part of motivation. When a person has a sense of which level of arousal he/she aims for and is in

and has relevant possibilities, the person will feel motivated. In order for the possibilities to be relevant, they must raise the person's level of arousal. However, what is relevant in the LBG? What is meaningful in the game? This depends on the LBG's frame that distinguishes meaningful play from our ordinary lives, and on the preferences of the player. Through the tension between possibilities that excite and are limited players can experience discovering the story of *REXplorer* through play-mode or as in *Treasure*, players can get spatially involved, or excited by, e.g., moving fast and conquering locations (coins). The motivation of players affects how they move in and act toward space while playing LBGs.

3.4.2 Mobility and Actions

Movement is central feature of play (Walz, 2010) in general, and a defining characteristic of LBGs is that players move between locations. In LBGs, we are able to move and act in physical space. As presented earlier (page 37), Böhme subdivides bodily space: space of perception, space of moods, and space of action (Böhme, 2007). Actions are linked to the body; in fact, the body is devoted mainly to actions (Merleau-Ponty, 2002). Human actions are always ascribed to intentions, and thus our actions have some meaning – even habits or absentminded actions (Merleau-Ponty, 2002). In LBGs, players are able to move physically around with an intention guided by the game at their own initiative. This movement is the source of creating meaning and thus different kinds of experiences. In order to create meaning in an LBG, the player must act in it. In doing so, the player ascribes meaning to space and thus creates locations.

In fact, movement (actions) is the prime source from which meaning is created, since it relates to doing and expressing our intentions (Merleau-Ponty, 2002). LBGs can guide player's actions, e.g., making paths in the LBG that lead players through locations infrequently visited, allowing players to link these locations and so that they become a part of the players' city; they are locations acted out and appropriated. For instance, *REXplorer* allows tourists to appropriate Regensburg and its history by playing the game. Thus, LBGs give us the power to appropriate space and take part in creating locations. Like cities LBGs are created by the movement and actions of players, who are at the same time creating the cities they are in. When we walk through space we are creating meaning, whether we are conscious of it or not. LBGs are mostly played in urban spaces. By *moving* in the city, being part of and embraced by it, we are *doing* the city, not *thinking it* (de Certeau, 1988): We normally do not think: "Now, I am contributing to creating a desire path in this park," when

crossing a lawn; we just do it. In this way, the city is constructed on a micro level without a plan, but by myriads of unrelated practices. Movement shapes the city. Referring to pedestrians, de Certeau writes: "Their intertwined paths give their shape to spaces. They weave places together." (de Certeau, 1988, p.97) In that respect, pedestrians' movement shapes the city.

According to de Certeau (1988), the city is text, written by people walking in it: Pedestrians are practitioners. They use a space that they cannot see: "These practitioners make use of spaces that cannot be seen; their knowledge of them is as blind as that of lovers in each other's arms" (de Certeau, 1988, p. 93). Only when climbing a tower looking down on the city can we "read" it and appreciate that it is created by us, the pedestrians. However, by being up there, we are at a distance from the city and cannot "write" it as we do when walking in the streets, choosing one route over another, leaving traces. In this relation, "reading" is interpretation on a distance, whereas "writing" means being situated in context while creating it. These two modes, "reading" and "writing," are

Figure 26: The *Spy in the City* interface provide players with a reading and writing perspective.

separate according to de Certeau (1988). Location-based applications create, as such, a doubled *perception* of space: Users simultaneously experience and inhabit their physical surrounding space, plus they have access to a representation of that same space mapped on their mobile devices (de Souza e Silva & Sutko, 2011) – or through teammates, as is the case in *CYSMN*, *Frequency 1550*, and *Visions of Sara*. When we move in the city with a GPS device in our hand, we are simultaneously writing and reading space as we shape it through our movements, creating links between units, and at the same time, we relate to its structures and infrastructures through the overview provided by the location-aware mobile device that also shows us our movements while we are performing them. We are reproducing space through our practice of moving in it (writing), and at the same time, we have a bird's eye view on the location being able to interpret it from a distance (reading) but without moving away from it. As players in LBGs are equipped with dynamic maps of the area in which they move, they can relate to this space from above, interpreting it, while they also create (actualize) locations, as they move through space.

It is through the movement of players in everyday space that the LBG play experience is created. Let us compare LBG play to the practice of walking in the city once again. De Certeau suggests comparing walking to the act of speaking. Thus, in order to analyze walking, he proposes using a speech-act model applying three functions of enunciation to walking. When articulating something, a person is *acting out* the language and thereby *appropriating* it and expressing a *relation* between the speaker and his/her interlocutors. Similarly, the pedestrian is acting out space, appropriating it, and expressing a relation to the surroundings (de Certeau, 1988).

Players of LBGs are performing – acting out – the game as well as the topological system when playing. For example, when playing *CYSMN*, the runners in the street are making the game come alive by chasing online players, while they "act out" the topological space: The online players are actually learning about the topology and thus context of the runners as they move in it, make sounds, and speak about it (Flintham et al., 2003). Players are thus expressing their relation to locations and toward other people through the way they act in play.

Players of LBGs are appropriating space using the LBG. This idea is developed by integrating a theory on appropriation of space created by André Jansson (2006). He has described three modes of leisurely spatial appropriation observed in tourism: The *antagonistic mode* that objectifies the surroundings; the *symbiotic mode* that shows a desire to become immersed into the environment; and the *contextual mode* that puts the emphasizes on being a tourist doing touristic events, rather than on the particularities of the environment (Jansson, 2006). These three modes correspond to three types of tourists (Jansson, 2006): The adventurer, the immersive, and the performative/traditional.

The *adventurer* uses the antagonistic mode of appropriation. This person appropriates new and "uncharted" environment for the sake of personal challenge and arousal. This appropriation is framed by rational organization and preparation, since the adventurer goes for something quite out of the ordinary. The adventurer can (be) reject(ed) communication technologies, putting himself "on the line" (Jansson, 2006). The adventurous, antagonistic approach to appropriation in LBGs throws the players into uncharted area, challenging them. This kind of LBG requires extensive planning and preparation on the behalf of game

designers. *URAAY* is an example of this approach. Players are challenged to leave behind their personal belongings including any means of communication (e.g., personal phone) and to disrupt ordinary behavior in public spaces by, e.g., following a person with a white tee-shirt or agreeing to help a stranger. The player is facing an ambiguous relationship (Gaver et al., 2003) and is thus put on the line.

Instead of objectifying space, seeing it as a scene for players to unfold, a particular environment can be the focus of interest. Players seek to become *immersed into space* in the symbiotic mode of appropriation. This player appropriates the environment out of curiosity about place, people, cultures, and their origins. This person is driven by a desire to understand the environment and connect with local social networks, wishing to not stand out and to avoid an objectifying look at the "locals" (Jansson, 2006). The immersive, symbiotic approach to appropriation in LBGs lets players travel throughout an environment – perhaps a familiar one – learning about it. The topic can be an environment's historical roots, which is the case with *Frequency 1550*, *REXplorer*, *Land of Possibilities?*, *Spy in the City*, and *Visions of Sara*; or a desire to become part of the social networks and explore which locations the network appreciates which can be done with *Foursquare*.

Finally, the *performative and traditional* approach to play uses the contextual mode of appropriation. The person in this mode focuses on leisure activities and social events rather than on the cultural authenticity of space. "The performative attitude is to be understood as an extension of the desire to gain new social experiences outside the ordinary frameworks of everyday life, without having to confront any problematic situations" (Jansson, 2006, pp. 25-26). The performative and traditional, contextual approach to appropriation in LBGs uses the environment as a mere scene for play activities. These are unconventional games that are unrelated to local culture, politics, etc. Their aim is to provide a break from the ordinary without causing problems. Examples are to leisurely move about in space and use positions of players when killing bots in *BotFighters*, or running around campus to find and surround Bob in *CatchBob!* Here it is not so much the relation to the specific location that is meaningful, but that the LBG legitimates acting out of the ordinary, while still using properties of locations.

These three types of appropriation show that a meaningful connection to locations can happen at different levels. Locations can be specifically chosen due to their spatial properties,

cultural richness or as they merely allow players to act out of the ordinary. These approaches are partly guided by the design, but also related to the player's mode.

Movement in the urban landscape is a defining factor of LBGs (Benford et al., 2003). Movement is not merely *movement* it should be movement with an intention as it is part of game-play. We can differentiate between performance (movement has consequences for the game) and transport (just moving) (Kristiansen, 2009). The game should

> encourage the players to perform – to do or experience something out of the ordinary when playing the game. If not, we reduce the site-specific games to merely a question of moving hardware around the city in accordance with some rules. What I term the "human cursor design." (Kristiansen, 2009, p. 122)

The movement of the players in not only site-specific games, but in LBGs in general, needs to mean something in relation to the game's outcome.

Players' movements in space are affected by the frame of the LBG, as it suggests what is relevant through, hints, story, rules, etc. However, external factors influence the actions of the players too. Players are affected by spatial features, which have different qualities that can be described in terms of affordances (Nova & Girardin, 2009). These affordances encompass: visibility of certain locations, known places, topography, the dynamic nature of space, and the presence of people (Nova & Girardin, 2009). Space is dynamic and can change the activities taking place in it through physical phenomena (weather, or presence of people depending on the time) or infrastructure issues (lighting, network problems, equipment fixes, or updates) (Nova & Girardin, 2009). These affordances affect us when we navigate or coordinate in space. When playing LBGs, players are playing in an unstable space. Changes in weather, light conditions, or instability of technological infrastructure can be important (Nova & Girardin, 2009). When there is little light, some areas can seem gloomy and players might avoid them; or players might want to avoid steep hills, private property, or try to stay close to buildings due to rain.

LBG play is affected by context in another way: The movements and actions in the LBG are read into the context of the game (*play*) and into the context of everyday life (*ordinary*). In relation to "reading" everyday spaces, Brewer and Dourish (2008) have suggested using three

terms: legibility, literacy, and legitimacy. These three terms are concerned with how spaces are read and found informative (legibility), how players relate to organization and representation of spaces (literacy), and the underlying worldviews behind this organization and representations that are embedded in technologies (legitimacy). These three notions relate to our understanding of structures and practices in space. These three are relevant to LBGs as they relate to how players move and act in space and how LBGs represent and relate to space.

Legibility is related to the readability of space, how people find places informative and affect patterns of actions. Legibility can be related to our personal experience of space, but also to a collective sharing the experience of and meaning for a space. LBGs can render spaces readable to players, as they relate to the information conveyed through the different aspects of space. LBGs do this by, e.g., highlighting historical aspects, helping players read the messages conveyed in architecture, pointing out the surveillance coverage that enables players to understand the struggle between privacy and safety in public spaces. LBGs can also give players an understanding of how others understand that particular space. *Foursquare* is an example of both, as players are asked to read space while moving in it, *and* they relate to the readings of other players as well.

Literacy is concerned with the way in which our experience of the world is shaped and shared. It is linked to the ways of acting in different settings, and how we organize and represent it, e.g., through mapping (Brewer & Dourish, 2008). LBGs can show players how to organize and map their surroundings by challenging them to read the infrastructures of space as it is done in, e.g., *Treasure* and *Feeding Yoshi*, or to perform their own mapping, e.g., mapping surveillance cameras in *CitySneak*. Thus, LBGs can allow players to articulate their concerns and fresh perspectives through their use of space.

Figure 27: Legitimacy: Sign restricting the use of a park (Copenhagen).

The practices and understandings of space are incorporated into representations including technologies. Several different epistemologies can exist at one time – sometimes conflicting – struggling for *legitimacy* of different forms of knowledge (Brewer & Dourish, 2008). The struggle over public space between different groups is an example of this. Moving through the city, we meet

signs, billboards, symbols, and structures that guide and restrict us. We are used to the many diverse intentions that meet us in urban space. Some of them we chose to obey; some, we ignore. As such, LBGs inscribe particular world views as well – a premise. They can be tools for legitimation, e.g., by bringing play into public space, or questioning the legitimation, e.g., surveillance as it is done in *CitySneak*.

We cannot avoid acting; even ignoring signs is an act. We cannot pull ourselves out of the situation and mull over it about it before acting. Our actions have intentions. Merleau-Ponty (2002) expresses it well: we are condemned to meaning due to our intentionality. As we move through town, we create it. Playing LBGs, these intentions and actions are guided not only by the game, but by the town as well. In LBGs, the meaning and thus the experience is created through this movement and actions.

3.4.3 Meaningful Play

LBGs provide players with a frame to produce meaning through their actions (Gordon, 2009). If the player is motivated and has interesting possibilities to choose from, then the player can perform actions in the LBG that create meaning. Meaning is created in the interaction between a person with an intention and the object or idea toward which the person is directed, in this way meaning is related to intentions (Merleau-Ponty, 2002). As we have seen, an experience is intensely meaningful and everything outside of it is meaningless in the context of play. The LBG does not produce a meaningful experience for the player to consume. A meaningful experience cannot take place without the participation of a user (Boswijk et al., 2005). Designers design frameworks wherein experiences take place (Walz, 2010). It is the player who uses the game as a tool, producing an experience with it (Jessen & Lund, 2009). The player engages in fiction and rules, playing, to produce a game fiction (Arvidsson & Sandvik, 2007) – i.e., the experienced story of the game. When taking part in this construction of play experiences, the players bring in their desires, anticipations, and previous experiences (Ermi & Mäyrä, 2005a). This is not particular only for LBGs. Games use the immaterial labor of players to produce experiences through play (Arvidsson & Sandvik, 2007). This is actually true for meaningful experiences that the development of meaningful experience concepts cannot take place without the direct participation of the (potential) customer (Boswijk et al., 2005). However, in LBGs, players are affected by the ordinary context, connect ordinary surroundings with play and create new meaning out of the ordinary. LBGs provide a frame that can indicate which kind of possibilities are relevant

in the game and offer a goal toward which the player can aim. When e.g. playing *URAAY*, it is relevant to follow the leads that help finding the office of Uncle Roy. A game can also create an atmosphere in which the player can participate. An example is *Frequency 1550*, when the players go to the harbor and perform a scene as fishermen, and the atmosphere is complete. Therefore, the LBG play experience is dependent on the player, what possibilities seem relevant within the frame of the game, as well as the circumstances in which the player is situated.

In relation to LBGs, how can we then understand meaningful play? According to Ermi and Mäyrä, meaning in games is "the part through which a player makes sense of her play experience and constructs her interpretation of the game against the backdrop of the various personal and social contexts of her life" (Ermi & Mäyrä, 2005a, p. 9). The experience is affected by who the player is; the players experience with the game or similar games; as well as the significance of games in the person's life (Ermi & Mäyrä, 2005a). Our preferences and tastes vary depending on personal situation and our experiences. Players compare play experiences with other experiences, and they use their knowledge and skills acquired through other things in their lives. In short, players do not leave their ordinary life behind when playing, and this meeting between ordinary and play makes play meaningful. According to Boswijk et al. (2005), and Carson (2000), the point of departure for our creation of experiences is our experiences in the everyday world. What is especially meaningful in LBGs is that they can provide a fresh experience of this ordinary life, pointing gaming affordances in our surroundings that we would not notice, e.g., if the LBG did not reveal that this area (in which we are playing) was part of Amsterdam dating back to the 16th century (Admiraal et al., 2009) or that a certain area of town has very poor GPS coverage, which is revealed to *CYSMN* players.

According to Salen and Zimmerman, meaningful play happens when "the relationship between actions and outcomes in a game are both discernable and integrated into the larger context of the game" (Salen & Zimmerman, 2004, p. 34). This means that the player receives feedback when she acts and that the actions and outcome of the game are related. This definition takes the relationship between player and system as a point of departure; however, this is expanded as Boron quotes Katie Salen claiming that "meaningful play emerges from the interaction between players and the system of the game, as well as from the context in which the game is played" (Boron, 2007, p. 30).

It is crucial to consider context as a part of the creation of meaning, since players do not strip off the experiences, expectations, and the skills that they have acquired in their everyday lives. In LBGs, context takes on an even greater meaning, since players move between different contexts (frames) during the game, affecting interpretation of events and the performance of the players. In the last section we saw an example of how context affects player actions: in *CatchBob!* players do not think the darker and less comfortable places on campus could be hiding the digital object, Bob (Nova & Girardin, 2009). Actions in LBGs can also have a meaning in the ordinary world. The meaning creation in LBGs is closely connected to context and thus the frames that players are negotiating.

LBGs are tools with which the player can create meaning and thus experiences: The game is used as a tool to achieve a mood, through the players incorporation of play dynamics (Jessen & Lund, 2009). Walz argues that in games there are play rhythms that create a movement forth and back either in relation to a movement the player performs himself, between players, between players and space or players and objects. Play dynamic is created from the way play rhythm relates to tension and termination (Walz, 2010). The play dynamics are the processes that we focus on when we in play switch forth and back between free movements and relate to the structure. This dynamic is the actions made relevant through the game's premise which directs the player's attention toward certain aspects and a certain type of mood, e.g., feeling dizzy, being silly, getting excited by speed, etc. It is the strategy employed to experience arousal. Game-play can consist of several dynamics that players can combine or chose between. The LBG designer offers players a direction of attention and dynamics they can engage in and thereby perform meaningful actions. In Chapter 7, dynamics that are particular for LBGs are described in relation to the meaningful use of LBGs potentials.

Games guide our mental energy into patterns that cause pleasure, i.e., they focus our attention on a goal (Csikszentmihalyi, 1991). The goal is used as a point of reference for ascribing meaning to and constituting our actions, e.g., it makes sense to jump over a bench if I want to pursue my goal of catching an online player in *CYSMN*. However, the goal does not have to be the goal of the game, as observations of Barkhuus et al. show: Players in the LBG *Treasure* chose to "pick pocketing" coins from other players as opposed to the more rewarding strategy of performing "collaborative uploads" of coins. Players did this as it was

more exciting to tease each other than to perform the safer upload (Barkhuus et al., 2005). Players intended to increase their excitement and "picking pockets" made this possible.

Players of LBGs choose between different dynamics relating to what gives them the most pleasure, as players will develop tactics and strategies that build on their practice and change their ongoing experience. They will create meaningful play, and the details of their play will show how competitive game features can be combined and traded off against collaborative features (Barkhuus et al., 2005). Players consider their own preference for arousal as a goal that constitutes picking pockets, as an example, rather than choosing the more efficient strategy. We play to experience an interesting game. We are overall in a "paratelic" state of mind, as we desire high arousal and excitement. Juul (2008) reminds us that players of multiplayer games who are ahead often allow their opponents to catch up as this makes the game more interesting. When given a choice, players go for the activities that increase tension and thus raise their excitement – sometimes even when it is a disadvantage in terms of winning the game.

When we play, we aim for excitement: "danger" within safety. Actions can increase the excitement and tension or decrease it. Apter uses an analogy about a tiger in a cage to describe how the protective frame allows players to take risks within danger. He states that a tiger without a cage produces anxiety in people. A cage without the tiger causes boredom. Only a tiger in a cage produces excitement, because it is danger within safety (Apter, 1991). This explains the thrill of "potential risky" actions in games, like "pick pocketing" in the game *Treasure* (Barkhuus et al., 2005).

Having a good game experience means experiencing a situation whereby the player is able to make meaningful action and thus experience meaningful play. Whether the play is in fact meaningful depends on several conditions. First, in order for actions to be meaningful, they must have some relevance within the frame of the game, which consists of the rules, the objectives, and the storyline. Second, the actions are related to the context of the game: the players' experiences, the situations in which they find themselves, and with whom they play. Third, the player needs to find and perform the actions relevant to his pursuit of a certain mood, i.e., his intentions. The player is seeking a certain level of arousal. The preferences for being aroused differ from person to person and from situation to situation (Apter, 1989).

Some like action-packed games: blood, beat, and boom; some get aroused from puzzle-solving games and some from submerging themselves into a fictional world.

3.4.3.1 *Flow, Immersion, or Incorporation*

To understand player experience of LBGs, we must relate to the ways these lead to complete experiences. When referring to the optimal experience, we often refer to "immersion" or "flow." These terms, as well as the alternative term "incorporation," are discussed in relation to LBGs in this section.

Theory on flow describes the elements of an optimal experience. These elements are supposed to be general to all kinds of experiences. The "basic criteria" of flow can be described using eight elements that encapsulate pleasure as a phenomenon. Not all of the elements have to be present in order to call it flow. A person experiencing flow is (1) facing a challenging task that is possible to solve. The person has a goal and the means to reach it and is (2) fully concentrated, on the (3) clear goals of the task that (4) provide immediate feedback. The person has a certain (5) degree of control over her actions (Csikszentmihalyi, 1991). These first five features relate to the player's actions. While the person is performing the actions that lead to the experience, the person feels (6) an amalgamation between consciousness and action. Consciousness relates to attention and thus the player's attention and actions are merging. This corresponds with how this author has argued that the LBG player's perception is affected by the LBG. The person in flow is (7) less self-consciousness, which makes worries seem less important, and subsequently, the self feels strengthened. This has to do with the protective frame that removes harm from the situation (Apter, 1991). Finally, the person's (8) sense of time is altered (Csikszentmihalyi, 1991).

The model of flow has been adapted specifically to digital games in the GameFlow model (Sweetser & Wyeth, 2005), which again has been adapted to pervasive games in the Pervasive GameFlow model (Jegers, 2007). Jegers queries the GameFlow model demand that "players should not be distracted from tasks that they want or need to concentrate on," cf. component (2) above, and that "games should quickly grab the players' attention and maintain their focus throughout the game" (Jegers, 2007, p. 4), cf. component (6) above. When sending players of pervasive – or location-based – games into the real world where real harm can happen, these demands will destroy the protective frame. If the designer is aiming for a game that holds players' concentration and eliminates distractions, dangers in

the ordinary world such as traffic can indeed pose serious hazards. In line with this is rejecting the demand that "players should become less aware of their surroundings" cf. components (2) and (6) above, which is irrelevant to LBGs, since their purpose is the opposite. Jegers also argues against too strict a control with the challenges given to the player, as the players in pervasive games are in charge of the game world. Thus, the game should not be pre-programmed, but offer players support in managing their game experience (Jegers, 2007). In LBGs that involve action not carried out through a digital interface, this makes particular sense, since the game system does not always know what has been accomplished. In relation to the component (3), that the task has clear goals, we know that LBGs do not always present clear goals. Players sometimes need to explore to interpret ambiguous information, although in the LBGs presented here, their overall goals are all clear, e.g., to find Uncle Roy, to keep Yoshis alive, to find the missing relic. Component (4) is that the player is provided immediate feedback. However, since the system cannot know all actions of players if they are performed in the physical space – not through a technical interface – it can be difficult to provide players with feedback when they do something.

Missing from Csikszentmihalyi's eight elements of flow are the motivation and intention of players: That the player wants to solve the task. Flow is a state in which people feel that they merge with their performance and that everything beyond this activity seems to be without meaning (Csikszentmihalyi, 1991). The relation between performance and meaning is related to intention through the following example: An experienced organist is supposed to play an organ unfamiliar to him. After a short period of rehearsal, he understands how to use the organ. To understand is to experience a harmony between what we *aim at* and *what is given* – between *intention* and *performance* (Merleau-Ponty, 2002). The organ is part of his bodily space, he aims at expressing the music, and if it succeeds, he has understood and can create meaning. The movement of the organ player creates this space of expression. His objective is not merely to depress the keys; his aim is to express the emotion in the music (Merleau-Ponty, 2002). When playing, the body of the organist and the organ are the media of the relationship between the score and the sound that rises from the organ pipes. It is the organ player's movement and interaction with the organ that creates meaning (Merleau-Ponty, 2002).

Similarly, in games, players should be able to adequately translate their intentions into in-game behavior (Sweetser & Wyeth, 2005). The interaction can result in an entertaining

experience, if the possibilities available to the player allow for expressing individual aims. We see this when players make a strategy that they execute, e.g., when runners make an ambush in *CYSMN* by exploiting bad GPS coverage. The example with the organist suggests that through rehearsal and repetition he is able to incorporate the organ's mechanism and thus create an even closer relationship between intention and performance. This can be observed with players of LBGs as well. For example, the players of the LBG *Treasure* learned to use the strategies that are more exciting to them, i.e., "pick pocketing" (Barkhuus et al., 2005).

Finally, the elements of flow does not relate to the spatial qualities of the experience that are important in LBGs. These are under consideration when talking about immersion. Immersion is a bodily sensation that affects perception and attention. Murray describes the mood of immersion as a sense of entering another world:

> Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all of our attention, our whole perceptual apparatus. (Murray, 1998, p. 98)

Immersion, as Murray describes it, derives from a bodily experience of being surrounded by water. It is a bodily mood directing our attention and affecting our perception toward otherness. Although the body is still in the ordinary world, the other world is felt, too. The subject brings her- or himself to this state by imagining the other world. Playing a digital game or reading a book, we are psychologically immersed (Murray, 1998). However, in LBGs, we are there with our bodies *and* we can become psychologically immersed as well. We need to distinguish between different sorts of immersion. Ermi and Mäyrä have described three types of immersion in relation to video games. Let us review and relate them to LBGs. The three types of immersion are (Ermi & Mäyrä, 2005a, pp. 7-9):

- *Challenge-based* immersion – a satisfying balance of challenges and abilities
- *Imaginative* immersion – the game offers the player a chance to use her imagination, empathize with the characters, or just enjoy the fantasy of the game
- *Sensory* immersion – related to the audiovisual execution of games

Although it is possible to experience all three types of immersion with most games, the challenge-based immersion has an essential role in games, as players must participate in game-play (Ermi & Mäyrä, 2005a). In LBGs, the imaginative immersion can happen in an ordinary environment that requires the player to forget the conventional meaning of elements and imagine new ones (Nieuwdorp, 2005). Sensory immersion in LBGs is not only about audiovisual execution; in LBGs, players can engage in a variety of stimuli. The immediate surroundings in which the player is immersed will affect the player's experience. Standing in the shadow of a towering building will make me feel small, whereas sitting on a bench in a quiet garden listening to a bird's singing can make me feel calm: I am in interaction with the world (Merleau-Ponty, 2002). Designing for the experiential aspect of space – or the senses – in LBGs is analyzed further in Section 7.1.

Immersion has been criticized for is placing a hard division between the represented environment in digital games and the operator (player) (Calleja, 2007). The separation between environment and protagonist is not useful with LBGs, since our interest lies in how LBGs can affect players' attention and perception toward their surroundings, i.e., the meeting between players and locations. Traditional flow and immersion theories need to be adjusted to understand LBG player experiences. Players in LBGs cannot take away their attention from the surroundings and be entirely absorbed by the task at hand, feedback is not always immediate, and tasks are not always clear. LBG players have intentions that they express through their performances. These performances are affected by the way the perceptual apparatus and attention is directed in the game. Yet this does not separate players from their environment; rather, they incorporate and experience their environment through the LBG. When play-spaces and ordinary life are merged, new types of experiences are created. Describing these, Calleja's (2007) term "incorporation" is adapted to LBGs. This is an alternative metaphor for flow or immersion that does not separate player and environment, although Calleja's focus is on a "virtual" environment: "Incorporation is the subjective experience of inhabiting a virtual environment facilitated by the potential to act meaningfully within it while being present to others" (Calleja, 2007, pp. 89-90).

Incorporation relates to a process

> incorporating (in the sense of assimilation or internalization) the environment while
> re-incorporating (in the sense of corporeal embodiment) the player through the

avatar in that environment. Both aspects of the metaphor need to be satisfied simultaneously. (Calleja, 2007, p. 88)

The LBG player assimilates to the physical everyday environment, while letting the rules, goal, and perspectives of the game affect their perception experiencing the game environment through these. This incorporation happens through six frames on two levels – micro and macro. Micro relates to moment-to-moment actions, whereas macro relates to long-term involvement. The six frames of involvement are tactical, performative, affective, shared, narrative, and spatial (Calleja, 2007, pp. 85-88). These are reviewed and related to LBGs:

- *Tactical* involvement on the micro level is concerned with all forms of decision making within the context of the game (Calleja, 2007). As we have observed, LBG players do get involved in tactical decisions related to reaching the goal of the LBG. These are incorporated through repetitions of similar tasks.

- *Performative* involvement is about the control of the game entities, learning to move, and this movement becoming internalized and fluent. It also relates to the player learning what to pay attention to (Calleja, 2007). In LBGs, players have control of other types of entities than the digital. Players' actions take place in both physical and digital space. However, moving in the physical world players control their position in space by moving the body, and learning what to pay attention to, is just as relevant as when players control entities in the digital world. The process of learning is somewhat different, since the affordances of the LBG can be infinite and thus unclear.

- Games are powerful tools to create *affective* involvement, as they form a feedback loop between the game process and player. Thus, games can affect players' moods and emotional states (Calleja, 2007). As pointed out, the feedback in LBGs is not always immediate. Still, players receive feedback on their actions, and part of this feedback comes from the physical environment that affects the players, too.

- As we play games, we do this in a dialog with a responding environment. In digital games, these agents can be controlled by either humans or an artificial intelligence (AI). Thus digital games have a *shared* involvement frame covering all aspects of communication with agents in the game world (Calleja, 2007). In LBGs, players communicate in the physical world and through digital space. We have seen how

audio communication between players in *CatchBob!* is impeded and how players in *Treasure* can tease each other by stealing coins through physical proximity and a command through the technical interface.

- In digital games, it is relevant to consider two types of *narrative* involvement: the "designed narrative" that encompasses a game-world's back-story and background. The other type is the "personal narrative" that relates to the player's interpretation of game-play experience (Calleja, 2007). In LBGs, the personal narrative can encompass personal, everyday actions. Further, players can apply the incorporated story onto surroundings even where there is no connection and thus experience the personal narrative as a designed narrative.

- *Spatial* involvement is concerned with how the player locates him- or herself in the game area. This covers exploration and exploitation of the game-space for strategic purposes (Calleja, 2007). In LBGs, this space is both physical and digital, not all of it is designed. The biggest difference is that the players are involved bodily in the environment being able to experience the spatial properties through their senses. Thus, in LBGs, the involvement is *spatial and sensuous*.

LBG players sense the game environment through their own body, not an avatar. The actions of players are carried out in the ordinary world, which makes the experience somewhat different when the performance becomes internalized and fluent, since it changes the player's perspective of the everyday environment. In LBGs, players need to disregard some of their experience with their surroundings in order to accept and incorporate that of the games. This is not necessary in video games, which Calleja's six frames are developed for, that are designed for the purpose. However, the six frames can work as a framework in relation to LBGs in which players internalize the game as well, perceiving their surroundings through the game and being situated in the play-space.

The perception of the surroundings is affected by LBG patterns, as they are incorporated and thus influence the player's experience of and meeting with locations. When this is experienced as meaningful it is a phenomenon I term *hybrid intuitive space*. This term combines the notions of hybrid space (de Souza e Silva, 2006), as a space in which players experience digital and physical space as merged, and intuitive space (Böhme, 2007), which relates to how we experience physical space through representational patterns. "Intuitive" is added to hybrid space to stress the importance of how LBGs affect the perception of players, and that

this is incorporated. This intuition encompasses the perceptual apparatus and attention of the players. The elements around us are not representations, but they are perceived through representational patterns (Böhme, 2007). For example: If a part of a word is hidden, we often can guess the word anyway, because we already know the whole word. This theoretical distinction can be used to explain what happens when we walk down the street and let location-aware applications guide us to the best burrito place in the neighborhood or play an LBG that shifts our perspective from the Amsterdam of today to the Amsterdam of 1550, as happens in *Frequency 1550* (Admiraal et al., 2009). The "technologically mediated world" does not stand apart from the "physical world." It is embedded in the physical world and provides "a new set of ways for that physical world to be understood and appropriated" (Dourish, 2006, p. 6). Playing an LBG, the player can experience digital and physical play-space through mood and perception, and act in it. When the meeting is meaningful it is an embodied experience in hybrid space, though designwise physical and digital spaces can be separate or created as an overlay. The perception of locations in LBGs is always affected by the LBGs frame; the technology, rules and narrative of the game – the "intuition" in Böhme's sense is affected by these patterns.

The player experience in LBGs relates to the motivation of players who move in everyday space, creating meaning through their actions. Players incorporate the structure of the LBG that affects their perception and actions in space. Often, they do this while relating to other players in space, either through media or face-to-face contact or through locations. The LBG player experience is dependent on the way designers have related physical and digital space, the structure of the LBG, how the LBG interfaces with locations, and how the surroundings affect the players as well as the players' intentions and motivation for a certain level of arousal.

3.5 Defining Location-based Games

Pervasive games, ubicomp/ubiquitous games, immersive games/ARGs, HRGs, MRGs, and LBGs are all incorporating elements of the ordinary world into their game-play. LBGs are a subset of pervasive games, as they expand the magic circle in at least one aspect, namely spatially. Some LBGs do not have a specific time frame. Some of them expand the magic circle socially by involving bystanders. However, in order to be considered an LBG, there must be a link between locations in the physical world and game-play. The outcome of the

LBG always depends on the player's movement and locations in the physical world. Further, LBGs involve players bodily, as players need to move through and sense the physical space. Thus, LBGs allow players to experience particular locations through their senses and to become involved in the structures of space. By letting players explore locations and relate to structures of space, LBG players gain new perspectives on their surrounding world. In this way, LBGs can relate to both practice of space and structures in space.

LBG designers can use both physical and digital media to create the game experience. Digital space is coded, which means some layers are accessible to players, while others are hidden. Designers can play on absence and presence; hiding information and revealing it depending on the situation. Code can be fragmented and recombined, allowing designers to distribute a story and tasks in an environment. This creates depth and makes the LBG dynamic. Coded spaces are also dynamic in terms of altering the code, so that it changes behavior and features. In this way, coded spaces are mutable and adaptable to players. The use of code allows LBGs players an extended reach and abilities. For instance, they can view large amounts of data normally inaccessible, they can leave traces, or access other people's trajectories. Thus, computation can be a source of exploration and discovery in LBGs.

The designer can let players interact through separate spaces; augment spaces or the body of the player retrieving data from these and delivering data to the player; or treat these spaces as intertwined. However, physical and digital spaces are not necessarily experienced as separate during the game, and using technology in LBGs should not remove players from their physical world but rather enable them to experience these in a fresh way through the patterns of the game. Players of LBGs are *experiencing* space as a hybrid intuitive space. This means that the LBG structure affects the engaged player's actions, moods and perception of locations.

LBGs can be designed for a specific location, be adaptable, or location-free. However, game-play is always related to the locations and context of the player. As locations always are significant in LBGs, designers should consider how players experience their surroundings through the game, and which gaming affordances of physical space should be made part of the LBG. These affordances can encompass structuring, experiential, metaphorical, and social aspects of physical space.

Instead of staging everything in the LBG, designers can design for players to make connections between whatever they encounter while playing the game. Players, who have incorporated the LBG framework, can create the connection between LBG and locations, producing a meaningful connection between the LBG and everyday world – even where none exists but seem to do (apophenia), or these connections can seem like a coincidence but be a designed part of the LBG. It also can be created by the system that adapts content to the infrastructure of an area.

LBGs are, as the name indicates, *games* with goals and rules, played to experience some level of arousal. In comparison with digital games, the rules of LBGs are often fuzzier, since they are not entirely dictated by a computer program. Thus, the rules are not necessarily explicit and unambiguous. They are up for interpretation, and thus the rules of the game are inconsistent, i.e., they cannot be interpreted the same way in every game. When designing LBGs, designers can make activities possible and relevant in the game, and they can regulate activities. This is achieved through, respectively, constitutive rules relating to the outcome of the game and regulative rules relating to the process. Often, in LBGs, rules are not spelled out, and they are negotiated by players. However, designers need to provide frames for players to negotiate events and actions in relation to what is meaningful in the game.

Instead of a single frame as point of references, in fact players of LBGs negotiate multiple frames at a time, e.g., the frame of the game, social rules, and juridical laws. As every action and all information can have several meanings, and because there can be discrepancies about the information technology conveys about physical space and space itself, there lies the uncertainty and ambiguity in LBGs. This is a central element in LBG play and can be used consciously by the designers, placing greater demands on the players' ability to create meaning.

In the ordinary world, we are bound by space and time. Harm can come to us, as our actions have consequences. When in play, we are going for some level of excitement. Within the play's frame, references of entities and actions are changed and through the play actions a particular significance is created. Players are shielded from harm by a protective frame, which allow them to pursue danger within safety. The protective frame can be a challenge to guard in LBGs. One must consider a range of security issues. Players sometimes suspend the laws of the ordinary world; they might not pay attention to real dangers, or they might

misinterpret instructions. The relation between the frame of the game and the conventions of everyday, ordinary life can conflict. Non-players might also become involved in the game without their consent.

Because they are set in the ordinary world, LBGs are stretched between fiction and authenticity. Here, we understand authenticity to mean something that exists independently of our perception and can withstand exhaustive exploration. Authenticity is characterized by how significance permeates and encircles the matter. Fiction is created; it is co-produced by the player as he or she imagines and enacts it. Fiction draws attention to another world that is separate from the "real world." LBGs, however, do not block out the ordinary world and the surroundings, rather these are used in and can be enchanted by fiction. Further, LBGs do not necessarily tell as story. Fiction can also be used as a part of framing actions in the LBG.

LBGs use location-aware technologies, often mobile phones, as a means of localization and/or communication. In the seams between networks gaps in translation emerge when using location-aware technologies. LBGs can point player's attention toward these, and make them part of the game. Further, LBGs need to handle these so that they do not obstruct play. Players of LBGs can also be part of the interface, as they make objects and events of the ordinary world meaningful in the game.

Moving is one of the main actions in LBGs. Players move between locations and relate to their meaning. Players participate in creating locations, as they engage in them through the LBG. Moving through space, players act out the game, expressing and building relations as well as appropriating both the LBG and locations. It is not only the LBG but also the environment that affects players' experiences and even their actions in the game. Players use their experiences from the ordinary world to navigate through both safe and unsafe places, as well as "reading" spaces.

Just as with everything in our ordinary world, the messages conveyed in an LBG can be ambiguous. Players then must consider whether to trust them and negotiate the meaning in interaction with the system. The true meaning of events and information presented to players during the LBG is not always easy to grasp, because designers of LBGs can choose to make the context, relationships, and information ambiguous to increase the effort players must put forth into creating meaning out of what transpires in the game.

Meaning is created by the player's engagement with and in the LBG. Meaningful actions emerge as players accept the rules and objective of the LBG, they relate to the context of play and to the players motivation. Continuous meaningful actions will help players experience pleasure – often reaching a high level of arousal. Thus production of meaning is concerned with the players' motivations and intention: When players choose what to do in the game, they counter their desires against sensitivity issues. The player accepts the LBG frame and leaves behind the conventions of the life-world domain. However, the LBG can spill over into the life-world domain after the game has ended. In addition, the patterns of the LBG affect our experience of the everyday spaces we inhabit.

Since LBGs are played in the ordinary world, the player experience in LBGs cannot be effectively described by the eight components of flow that absorb the player's attention or by immersion that describes the experience of being submerged in a distinctive world. Players incorporate the structures of the LBG that, together with their motivation, have an effect on their attention and perception. Even after the LBG has ended, the play experience can still affect the player's experience of the ordinary world, making players more attentive and explorative toward the world. LBGs allow players to be creative and interact with their surroundings. In this way, players create the experience, turning spaces into locations. Assigning new meanings to the environment is part of the excitement in LBGs.

In conclusion, LBGs are games in which the players' immediate surroundings and the locations they visit result in a direct influence on the outcome of the game. The designers' conceptualization of the relation between physical and digital media affects the players' experience of and interaction with locations. The interface of LBGs is often ambiguous. It can consist of a conglomeration of location-based technologies, everyday world objects, and the minds and bodies of the players. Meaningful play in LBGs is related to the mobility and actions of players performed with an intention, their motivation, and the structure of the game itself, encompassing its framing and rules, and the context of play. In LBGs designed for meaningful meetings with locations, players move in, communicate, and relate to their surroundings through the game without being removed from these surroundings, i.e., they experience a hybrid intuitive space. LBGs make it possible for players to act out, express relations toward, or appropriate locations using digital and physical media; between multiple frames of ordinary life and play; within fictional and authentic structures.

Throughout Chapters 2 and 3, I have described and defined the concepts of both LBGs and spatiality in relation to LBGs from a theoretical standpoint. The next step is to examine the structural practices (design) and the tactical practices (player experience) empirically through observations and participation in LBGs, and through design as well. In the next chapter, I recount the method used for this process.

In this chapter, I first outline *what is being studied*; this repeats the inquiries presented in the Introduction. Second, I provide an *overview of the research activities*. Third, I present the *methodological approach*, namely, design-based research (DBR). Fourth, *DBR* is presented along with an elaboration concerning how the project aims at developing theory, improving practice, and contributing to design knowledge. Fifth, I present the actual *methods* used: participation, game design, observation, and interview, and treatment and analysis of the data.

4.1   *What Is Being Studied?*

This dissertation's focus is what a meaningful meeting between LBG players and locations is. I explore this phenomenon from a design perspective, striving to understand how to create such LBGs. The research aims at creating a knowledge base that can support game designers in developing LBGs that frame a meaningful meeting between player and location. I ask which prerequisites will make the meeting between the LBG player and spatial locations meaningful to the player.

To understand and create this kind of LBG, next I ask how can we conceptualize LBGs and spatiality in relation to the LBGs? This question has been approached through the literature review, in which a theoretical framework was created and explored in Chapters 2 and 3; it will be investigated further by studying actual LBGs, observing play, and designing an LBG. Further, these findings are related to the elements found through my review of the LBG research and my presentation of the theoretical framework to LBG structures in Chapters 5 and 6.

When studying the relationship between the LBG and the locations it incorporates, we want to determine 1) by what means can we understand and describe the player experience in LBGs, which was discussed in Chapter 3, and 2) how does the player create an experience by playing an LBG in the ordinary world? We explore this by observing play, interviewing players, and playing LBGs, which we will read about in Chapter 7.

The primary approach used is DBR, a research process comprising research and design (Wang & Hannafin, 2005). This approach and the reason it was chosen is presented immediately following the overview of the research conducted in relation to this dissertation.

4.2   Overview of Research Activities

A number of methods have been used to understand the relation between LBGs and their elements with a focus on spatiality and to approximate the experience of LBGs. These are:

1. Participation in different LBGs
2. Observations of players playing LBGs
3. Design of *Visions of Sara*, an LBG
4. Interviews with players on the subject

The different research events within these four areas are mapped in the illustration below:
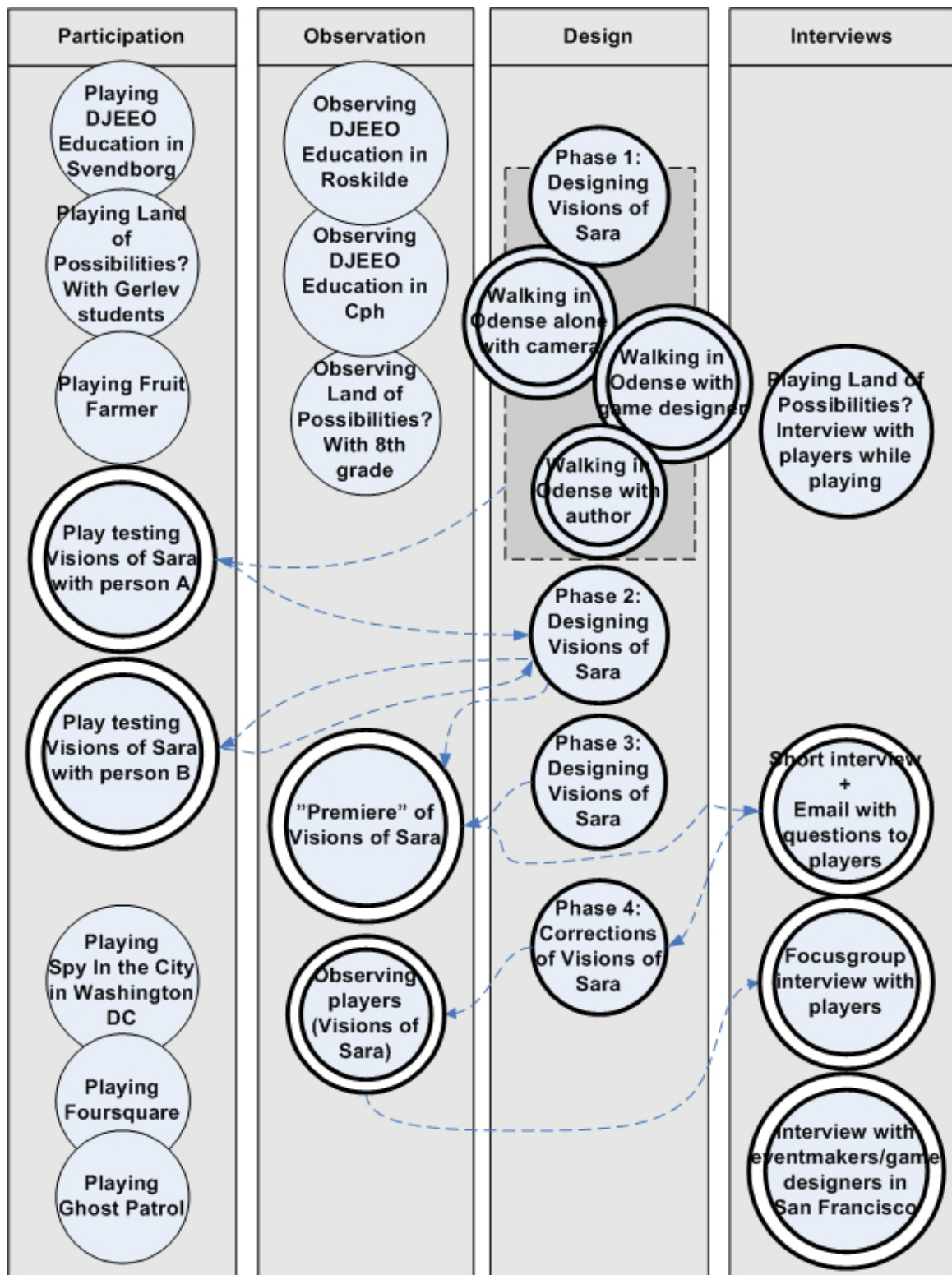
Figure 28: Overview of research activities.

The activities that relate to the LBG created in connection with the study have a thicker black outline. The arrows between these elements indicate the process between development, testing, observations, and the interview. These phases are elaborated in Section 5.2.4. The

tasks listed in the bubbles at the top of the model were conducted first, although the bubbles' placement does not correspond *exactly* to when their tasks were accomplished.

This model is meant to provide an overview of the activities. Let us return to the methodological approach underlying these activities.

4.3   Choice of Methodology

In this dissertation, the relationship between LBG, spatiality (locations), and play experience related to design is of primary interest. An experience is not directly observable. A methodology that sheds light on the phenomenon must be chosen and used, thus validating the results, i.e., it allows the study to hit "the bull's eye" of the research object (Golafshani, 2003).

A feasible approach is to choose a case study approach analyzing existing LBGs as cultural products using existing descriptions of LBGs and descriptions of play experiences as data. However, since the focus of interest is on understanding player experience to inform LBG design and to find new perspectives, a method that also allows direct observation of the LBG play experience is required.

Various ways allow us to approximate the LBG play experience. The aim is to study the phenomenon in detail, not achieve standardized and systematic comparisons. It is not to make a quantitative analysis of the phenomenon but to understand it in its own context. Consequently, qualitative methods seem appropriate for this project, as it uses a "naturalistic approach" to understand phenomena in context-specific settings (Golafshani, 2003, p. 600). Golafshani uses the term: "a naturalistic approach" about the research conducted. The naturalistic approach is opposite of a laboratory setting. The underlying assumption is that "truth" is found near the locations of "real practices." The LBG play practices do not take place in a laboratory. McMillan et al. (2010) have conducted a design study of LBGs. They write that

> in contrast to the lab-based environment of more traditional usability-style studies, it has been argued that experiments carried out in situ can help evaluators gain insight into how people fit systems into their existing practices and contexts of use, and how

people change their contexts and practices to accommodate or take advantage of new systems. (McMillan et al., 2010, p. 210)

The lab-based environment is a controlled environment in which researchers try to monitor variables to understand a certain element. This does not make sense in relation to LBGs, as their game-play is often interwoven with everyday practices and locations. In contrast, observing players playing an LBG in their "normal" environment allows researchers to see how this environment and the habits of the players influence each other.

One way to effect this type of study is to apply an ethnographic approach. The researcher becomes directly involved, keenly observing in situ for an extended period people's daily lives – watching what they do, listening to what they say, asking questions, collecting documents, artifacts, and anything else that might serve as data capable of telling a story about everyday life in relation to the topic of interest (Hammersley & Atkinson, 2007). In this case, the topic of interest is LBGs and related activities such as playing the game in public, playing video games, using location-aware technology, etc. Although potentially interesting, this approach is not relevant for this dissertation, as the aim is to gain insights about LBG experiences, and there has been no practice to study as such. Thus, while the ethnographic approach cannot be our primary methodology, observations that use methods inspired by it will be used, despite the challenges of following player's activities on small devices and across spaces (McMillan et al., 2010).

Approximating the LBG experience also means getting close to the action. However, this action is not necessarily observable in a "real-world setting." When I began my dissertation, LBG networks, commercial LBGs, and LBGs (that were not just events) were scarce, and thus to study an LBG being played, events had to be set up with available LBGs (*Land of Possibilities?* and *DJEEO Education*). These observations were supplemented by studying LBGs through design of a site-specific LBG. Designing an LBG makes it possible to study the relation among an LGB's various elements and by modifying them, one can learn about their interdependence. In addition, it is possible to set up research events on an as needed basis. Designing LBGs as a part of conducting a study is a method often used within the field of LBG research. The approach has been chosen by numerous LBG research scholars, who have created LBGs (or a platform for LBGs) that inquires after some aspect of design or experience and then recruits players willing to try them out for a specified period (e.g.

Admiraal et al., 2009; Ballagas et al., 2007; Barkhuus et al., 2005; Bell et al., 2006; Benford et al., 2003; Benford et al., 2006; Chalmers et al., 2005; Diamantaki et al., 2009; Flintham et al., 2003; Gustafsson et al., 2006; Kristiansen, 2009; Matyas et al., 2009; McMillan et al., 2010; Mäyrä & Lankoski, 2009; Nova & Girardin, 2009; Sweeny & Patton, 2009; Söderlund, 2009; Walz & Ballagas, 2007). These studies have resulted in the following LBGs (and platforms): *CYSMN*, *URAAY*, *Feeding Yoshi*, *Treasure*, *Hungry Yoshi*, *Songs of the North*, *LOCUNET* (a platform), *CatchBob!*, *CityExplorer* (a platform), *CitySneak*, *REXplorer*, *Frequency 1550*, *Proxiball*, *Gainers n' Drainers*, and *Klintespillet*. One reason this approach may be popular is that studying LBGs is partly a technical concern, as it involves developing new technologies, and partly that LBGs have been difficult to find outside of a research context. Therefore, it is fair to say that this is a proven method within LBG research. Accordingly, in this study, an LBG has been created as a part of the research method.

Apart from observing play, creating an LBG, and interviewing players about their experience, participation in play is relevant as well. Copier (2005), in referring to the method chosen for her Ph.D. dissertation on role-play, argues that since role-play is performative, she must play them to study them fully. LBGs rely on performances, too, and since I had never played nor designed an LBG before starting the research, it seemed even more important to try LBGs out in order to understand them. Thus, I have given participation in LBGs a high priority as part of my research activity in this project.

Consequently, this study encompasses observing LBG play, creating an LBG, interviewing players about their experience, and participating in LBGs. Different research instruments have been used to explore the relationship between LBG, location, and play. However, the methodology approach connecting them is DBR.

4.4   Methodological Approach: Design-based Research

This dissertation aims at exploring the prerequisites for designing LBGs that create meaningful meetings between players and locations. To do this, an understanding of the use of and experience with these games is needed. In addition, the research must examine LBGs from within to gain an understanding of LBGs' mechanics. To contribute effectively to the design of LBGs, we need to both observe and experience play with LBGs. Further, we need to be able to go into the "engine room" and tweak the mechanisms, i.e., to experiment with

the design of LBGs. DBR is an approach that combines and strives to improve design, research, and practice concurrently (Collins, Joseph, & Bielaczyc, 2004; Wang & Hannafin, 2005). The researcher participates in creating a design and implementing it, based on his/her knowledge of, and questions about the phenomenon being explored. DBR is defined as

> a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories. (Wang & Hannafin, 2005, pp. 6-7)

The phenomenon studied using DBR has traditionally been educational practices, as the quotation indicates. Although a few of the LBGs being studied here – in particular *Frequency 1550*, *REXplorer*, *DJEEO Education*, *Land of Possibilities?*, *Spy in the City*, and *Visions of Sara* – are related to formal and informal learning, evaluating the learning outcome and processes is not the phenomenon of interest in this dissertation. This means that the methodology must be adjusted in studying LBGs and eliminate the considerations regarding implementation in schools, evaluation of learning outcomes, etc. Educational innovations are often developed for an existing practice – such as a school setting. Conversely, an LBG does not necessarily limit itself to a unified context but must fit into several contexts, as players relate to multiple contexts during the game. With LBGs, at present, no network of professionals (developers) who work side-by-side with practitioners (players) exists, as is the case in schools in which teachers and learners have direct relationships.

Still, I find sufficient similarities between LBG systems and educational innovations that render DBR relevant for this study. Within DBR, educational practices are described as "complex interacting systems that involve multiple elements of different types and levels" (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003, p. 9).[12] LBGs are complex interacting systems. Here, *system* can be understood both as a computational system but even more important, as a system in which multiple elements (as we have seen in Chapter 3) of different types and levels are interdependent. In this study, this concept is explored through

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[12] In the essay, "Design Experiments in Education Research," the authors (Cobb et al., 2003) use the phrase "design experiments" rather than design-based research. But this text is later paraphrased as being about design-based research (Wang & Hannafin, 2005).

theoretical discussion, observation, and design as regards the ways the elements in the LBG work together to support a meaningful experience for the player. Further, DBR is concerned with how research and innovations respond to the emergent features of settings (Collins et al., 2004; The Design-Based Research Collective, 2003), along with user motivation (Collins et al., 2004; Dede, 2004), and the experience of "users" (Collins et al., 2004), which are also concerns of this study.

DBR challenges the assumption that research is contaminated by the external influence of the researcher (Wang & Hannafin, 2005). Instead of trying to become an invisible "fly on the wall," a DBR approach allows the researcher to become involved in the design and to participate in the practice. The researcher is not merely gathering and processing data in order to contribute objective knowledge (Kvale, 1997). Rather, research is a journey that changes the researcher during the process. This approach includes recognizing that the researcher's worldview affects the data presented in the results. The researcher cannot disclaim her frame of reference, and findings are indeed a result of the researcher's own interpretation (Kvale, 1997). For others to follow these changes, the researcher must document the interpretations and design changes. We will come back to this concept further on in this chapter.

Every methodology has unique challenges. DBR studies are executed in "messy" situations with many different elements affecting each other; some are controllable, some not. Thus, the researcher cannot isolate one element, changing it and keeping everything else constant to see how that particular element affects the situation, as can be done in laboratory research. Difficulties arise from the complexity of real-world situations and their resistance to experimental control (Collins et al., 2004). As elements change complexity grows, and using DBR often means amassing vast amounts of data, as everything can be regarded as such during the study. Considerable resources are needed simply to collect these data, and the resulting amount leads then to a data reduction problem, because not everything can be analyzed. Consequently, the researcher must be careful not only to search for data that support theories and assumptions, but also to be especially aware of contradictions and new perspectives (Collins et al., 2004).

Creating an LBG takes considerable time; it requires a variety of technological and creative skills; and it requires funding. During DBR the researcher needs to both keep in mind that

the design relates to the research questions, and to be aware of the conscious and unconscious reasons underlying their design choices. As an example of how potentially unconscious motivations can affect design, Dede (2004) notes that when fascinated by some artifact or solution, people tend to start with this and then seek problems that it can solve, which is not an advisable approach. In this relation, Dede criticizes DBR for a lack of standards. He asks, "How much theory should guide a design for studies of its implementation to merit the term 'design-based research?'" (Dede, 2004, p. 111). Within the methodology itself, we find no answer; researchers must decide, depending on the purpose and scope of the project, and balance theory, research goals, the needs of users, and creativity of the researchers. In addition, there is the challenge of comparing across designs, as each design unfolds in a particular context with different features affecting it. Such challenges can make DBR difficult to execute and conclusions somewhat uncertain (Collins et al., 2004). Accepting the complexity, aiming for a systematic treatment of data, and keeping the research questions in focus in order to limit the amount of data are all necessary when conducting DBR.

Regardless of how aware the researcher is about the theoretical point of departure, the intervention will always embody theoretical claims and commitments to gaining an understanding among theory, designed artifact, and practice (The Design-Based Research Collective, 2003). This is the purpose, as the intervention is trying out the theory in practice in order to develop both. However, this requires the researcher be aware of the choices at all levels in the design, which is a challenge. Even when the researcher is fully aware of the underlying reasons for each choice and has kept a focus on research questions, one finds that "enacted design is often quite different from what the designers intended" (Collins et al., 2004, p. 17). However, this can lead to fresh insights that, e.g., a case study or ethnographic observations would not bring out, since the researcher can reflect upon the (more or less conscious) assumptions materialized in the actual design. The strength of DBR is that it focuses on how designs work in the melting pot of practice (Dede, 2004). Because DBR blends empirical research with the theory-driven design, it is a methodology enabling us to examine how, when, and why innovations work in practice (The Design-Based Research Collective, 2003). This is a strong incentive for choosing DBR when trying to gain an understanding how the use of LBGs can unfold. Conclusively, DBR is relevant for this study, as it strives to (Cobb et al., 2003; Wang & Hannafin, 2005):

    A.   Develop theories as a consequence of designing a system and inquire through this

B. Improve practice

C. Improve design of a certain type of system

The dissertation delivers theoretical insights relevant for designing LBGs. DBR is concerned with improving practice as well. In this case, practice is understood as being related to the business and design as an activity. Although developing practice is a goal in this project, the most important aspect is to contribute with development of theory and design knowledge in this area, in support of this topic as an academic project.

In the following sections, I clarify how this project contributes in each of the three areas listed above as A, B, and C.

4.4.1   Development of Theory

In order to improve practice and design, a conceptualization of LBGs' structures and the players' experience playing LBGs is needed, as knowledge concerning the elements of what is being designed is a prerequisite for contributing to design (Gero, 1990). This conceptualization was introduced in Chapters 2 and 3, and continues throughout the following analysis.

To ensure the relevance of the research in relation to other studies conducted, literature on LBGs has been reviewed and two LBGs – *Land of Possibilities?* and *Fruit Farmer* – have been played before designing *Visions of Sara*. Through this review, central elements of LBGs, gaps in research along with existing problems and issues have been identified. The theory is developed out of earlier theoretical discussion, design, and empirical research. Challenges and questions arose as a result of design and players' reactions to *Visions of Sara*, which led to changes in design and new observations. These observations and observations with other LBGs have led to findings discussed in the context of existing research. Out of these a theoretical conceptualization describing the relation between LBGs, spatial locations and player experiences has been developed. The research contributes to the understanding of LBGs as well as builds an understanding of the experience of playing them. The theories used and the theory created through this research should be evaluated according to their contribution in creating LBGs that enable meaningful meetings.

The point of departure for DBR is theoretical (Cobb et al., 2003; Wang & Hannafin, 2005). Wang and Hannafin (2005) suggest selecting a theory about the phenomenon that informs design and ensures that the research is relevant. Accordingly, LBG research has informed the design of *Visions of Sara*. However, during the design iterations in this project, I have supplemented this with contributions from other strands of literature, when I did not find something in the LBG research that could help me: For example, after playing *Land of Possibilities?* I found that the experiential aspect of space affected the experience. To develop a game that related to spatial aspects Lamm's (2002) theory on spatial aspects has been used as a framework to find interesting locations in Odense for the game, and to describe these theoretically.

During the design phases, experiences and observations have affected the project's focus so that it gradually became more specific, as the example on experiential spatial aspects shows. To capture this, surprises, contradictions, and new perspectives that influenced the research process along the way were noted in a research diary. In this way, the theoretical contribution emerges from analysis of and experience gained by participation in practice and design. These two areas are covered in the next two sections.

4.4.2   Improvement of Practice

DBR is grounded in collaboration with the people who work with the phenomenon, in this case LBGs, from day to day. DBR stresses the importance of this interaction between researchers and practitioners (The Design-Based Research Collective, 2003). In this project, collaboration with the Danish start-up company, *DJEEO* A/S was established. *DJEEO* now, four years later, produces educational LBGs for the Danish, Swedish, Norwegian, and English markets, and its games have been played by thousands of players.

When the cooperation started, *DJEEO* had one game concept: *DJEEO Education*, in which tasks were closely linked to school curricula. However, *DJEEO* wished to penetrate a new market area: entertainment. In cooperation, we have explored this possibility, which has resulted in sales of LBGs that built on our experiences with *Visions of Sara*. Thus, research has informed practice. Through this collaboration, research has affected the establishment of a design practice by creating an easily accessible LBG that players can play without an instructor and that comes at no monetary cost.

When engaging in collaboration, "goals and design constraints are drawn from the local context as well as the researcher's agenda" (The Design-Based Research Collective, 2003, p. 6). Participants must negotiate these goals and handle the constraints accordingly. This is both advantageous and challenging. It is advantageous because the intervention is designed for the context of use, and challenging because local goals and the researcher's agenda can diverge. As an example, the initial research interest was in creating an LBG for one of the "voids" in a town, i.e., places that people normally do not visit and is not used. In Odense the former industrial harbor is such a place. However, local investors were interested in locating the LBG where there was considerable traffic in order for the game to find its widest cohort of players. It was possible to work around this divergence in agenda and local goals. In this fashion, DBR has been a interactive process, as practitioners, investors and researchers are all involved in the design process (Wang & Hannafin, 2005).

The chance to cooperate with *DJEEO* gave me the opportunity to design an LBG. Design is the third of the three areas to which DBR should contribute.

4.4.3   Improvement of Design

The dissertation contributes with design knowledge concerning LBGs that actually make use of the possibilities of the medium and create meaningful meetings with locations. This knowledge is targeted at informing and improving LBG design processes. Design can be understood as the act of creating or modifying materials, activities, environments, or other elements of practice in order to create a system within a specific set of pragmatic and local constraints (Baumgartner & Bell, 2002). In this case, the system is an LBG, and the local constraints relate to the location for which the game is designed, the technological platforms available, and the demands of the benefactors. The design activity is goal oriented, as the designer aims at affecting something in the world (Gero, 1990). Here, this would be the players' actions, attention, mood, and experience of their surroundings.

DBR is characterized by an iterative cycle between design, implementation, analysis, and redesign (Dede, 2004; The Design-Based Research Collective, 2003; Wang & Hannafin, 2005). During this iterative process, the researcher must balance the role as researcher and designer in considering the constraints of practice, the quality of the game, and the maintenance of the inquiry. This process calls for flexibility, as demands, constraints, and knowledge change during each cycle of inquiry (Wang & Hannafin, 2005). This project was

challenged to ensure a certain quality in the LBG and adhere to deadlines that the benefactors had established, while maintaining focus on the inquiry. Discrepancies can also arise between the researcher's goals and those of the designer, which is an additional challenge when the same person holds both roles. When taking on the role of the game designer, decisions are made in consideration of how game tasks can be made interesting, whether the challenges are suitable in difficulty, the story is coherent, etc. The researcher, on the other hand, is concerned with whether the design will address the inquiry. An example with the design of *Visions of Sara* is that a few of the tasks in the game were developed to provoke the players or to see how they would respond to these tasks. In one case, this conflicted with creating a frame for meaningful play, a task to which I will return in Chapters 5, 6 and 7.

In order to be relevant and usable for the practitioners, the results of a DBR study must be presented with their practice in mind. Baumgartner and Bell (2002) suggest making the distinction between design knowledge and design principles. Design knowledge is "the ideas, theories, principles, and heuristics that guide the process of design" (Baumgartner & Bell, 2002, p.3). This knowledge can inform the practice of design, as it implies knowledge of how to apply theories – pragmatic as well as other forms of expertise – to create and qualify design. Design knowledge addresses a need within the research community to share knowledge in a way that can influence the development of innovative products. Design principles, on the other hand, articulate aspects of design that are applicable in a range of contexts (Baumgartner & Bell, 2002). Design principles are specific and context bound. Design principles are one form of design knowledge, targeted at designers aiming at informing design decisions. After design knowledge has been developed, the next step is to formulate design principles. However, within the scope of this dissertation, the emphasis is on theoretical design knowledge over formulating practical design principles.

The findings of the dissertation are being reported in an academic context. This can be challenging, as DBR is an experimental process and it is carried out in messy situations (Collins et al., 2004). To track this process and attempt to impose order on the messier aspects, I kept a research diary, supplemented with notes from events. I have reported what has happened during the process, but also noted events that inspired, and surprised, as both researcher and designer. During the process, it can be tricky separating those details that are actually important from those deemed less so. Moving through the process, I learned aspects

that had seemed of little significance were important and their documentation was helpful, while other incidents that I came to realize were more important than first thought had not been recorded as faithfully. This happens because the research process is a learning process as well, through which an understanding of the phenomenon is developed. Thus, a gap exists between the confusion and priorities of the process, and the result. Keeping a diary was done in order to bridge this gap between process and reporting on the research. Due to this gap between process and report, the structure of reporting the findings also differs fundamentally from that of the process. Collins et al. (2004, p. 38) propose the following steps when reporting on DBR:

- Identify goals and elements of the design
- Describe settings where implemented
- Describe each phase of implementation
- Report outcomes found
- Pull together lessons learned (including both successes and failures)

Although it can be challenging to separate the phases as they are intertwined, and each change marks a new phase (Collins et al., 2004), the design process has been separated into three major phases and the five steps above are used as a guideline for presenting these phases. This presentation is found in Chapter 5 that reports on the design of *Visions of Sara.*

The methodology of the project has now been outlined, and it has elaborated how the research contributes to development of theory, practice, and design. In the following section, the methods used are elaborated.

4.5   Methods

DBR uses method triangulation, as it integrates a wide range of approaches ranging from observations through case studies to interviews (Wang & Hannafin, 2005). In this project, a review, observation of play, participation in play, creation of an LBG, and interviews with players have been conducted. The review, observations, and play experiences have all informed the design of the LBG. Creating the game and observing people playing LBGs as well as interviewing players have elucidated the relation between LBG, locations, and player experience.

Via method triangulation, the phenomenon is approached from different perspectives. By conducting the interviews, the multitude of the players' understanding of LBGs can be captured, which is the strength of the interview conversation (Kvale, 1997). Through observation, the players' response to, and actions when playing the LBG are examined. This is valuable, for it reveals aspects of LBG player experience and can be used when interviewing players as a point of reference. Participation and design has allowed experiencing LBGs from within.

When observing and interviewing players, I documented the event in writing. These were mostly descriptive, reporting what was going on, and recounting snippets of dialogue and events (Schrøder, Drotner, Kline, & Murray, 2003). On some occasions, the events were also recorded on video- or audiotape. When possible, notes have been made and photos taken while participating in LBGs. However, playing LBGs requires attention, too. Most of the time the hands were in use, thus precluding taking notes while participating in the LBGs. My own approach to participating in and experiencing LBGs has been to not prepare certain questions or come with predetermined goals but to be able to *experience* rather than analyze the situation. With observations and interviews on the other hand, questions and goals were prepared in advance.

In the next section, the approach to participation, game design, and observation/interview is presented. At the end of this section, I present how data are treated.

4.5.1   Participation: Location-based Games Played

I have participated in nine LBG sessions with seven LBGs. These are the chosen seven: *DJEEO Education*,[13] *Land of Possibilities?*, *Fruit Farmer*, *Ghost Patrol*, *Spy in the City*, *Visions of Sara*, and *Foursquare* (presented in Chapter 2). In all cases except for two (*Fruit Farmer* and *Ghost Patrol*), these games have been played with other people. They cover a variety of game-play, differ in relation to temporal limits, and use locations differently as presented in Chapter 2. With regards to game-play, there are puzzle-solving games related to informal learning (*Spy in the City* and *Visions of Sara*), fast-paced action games (*Fruit Farmer*, and to some degree *Ghost Patrol* and *DJEEO Education*), a game that relates to conquering space (*Foursquare*), and serious games that relate to education (*DJEEO Education* and *Land of*

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[13] This game is presented in Chapter 5.

Possibilities?). Some of these games are limited temporally to game sessions (*DJEEO Education, Land of Possibilities?, Fruit Farmer, Spy in the City*, and *Visions of Sara*), and some are always in play (*Ghost Patrol* and *Foursquare*). Concerning the use of locations, these LBGs represent site-specific designs suited for a particular location (*Land of Possibilities?, Spy in the City,* and *Visions of Sara*); site-relative designs that either allow players to create the relation between location and game (*Foursquare*) or allow the designer to move the game with little effort (*DJEEO Education*); and location-free designs that adjust game space to the setting of the player (*Fruit Farmer* and *Ghost Patrol*). These seven LBGs also take place in a range of environments. Locations at which they have been played and studied include:

- An outdoor museum (*Land of Possibilities?*)
- The streets of a city (*DJEEO Education, Spy in the City*, and *Visions of Sara*)
- A field on campus and in my neighborhood (any outdoor location at which a player wants to play) (*Fruit Farmer* and *Ghost Patrol*)
- Cafés, at the job site, at home, etc. (any venue a player can visit) (*Foursquare*)

That the seven different LBGs are set in different settings has resulted in diverse experiences with different cases. These settings have affected the findings obtained through the study, as they are connected to both the design process and the setting in which they are played out, as DBR prescribes (Wang & Hannafin, 2005). By participating in these seven LBGs, I have studied a range of design strategies and LBG game-plays that have been included in this dissertation's empirical data. The LBG *Visions of Sara*, which is my design, is also included in the empirical data. The following sections describe how in designing this game I also have used it as a direct method for examining LBGs.

4.5.2 Design Process

The game, *Visions of Sara*, and how it was created is presented more thoroughly in Chapter 5, "Inquiry-based Design". In this section, methodological considerations regarding the design itself are presented.

The goal of designing an LBG, as part of this process, is twofold: 1) to inquire about the elements of LBGs, the players' experience of the LBG, and the spaces in which it is set, and 2) to create an interesting game for the players. These goals are not necessarily consistent with each other, as mentioned. A few tasks have purposefully been designed that they do not

contribute to meaningful play (these tasks are presented during the analysis). These are made to provoke players' reactions. This approach of provoking informants is inspired by Ermi and Mäyrä (2005b) who have described how provoking scenarios of pervasive games enticed participants to discuss the matter, reflecting on their ideas and opinions. This is especially relevant when the topic of inquiry is new to informants.

The aim was to design a game that related to the research questions presented in the introduction. The design: A) explores the relationship between an LBG's elements and the locations to which it relates and allows for examining how this relation affects the design of an LBG, and B) consequently affects the game experience; and C) helps to examine which characteristics are required to make it interesting and meaningful for the player to play a game set in physical space. Note that *Visions of Sara* is not the only source of data in this inquiry; interviews, participation, and observations of and experience with other LBGs are also part of the data. In this way, the dissertation relates to more than one specific kind of LBG.

In DBR, after identifying the purpose of the study, the specification for the design is made based on theory and a review of the literature (Cobb et al., 2003). In addition to playing *DJEEO Education*, *Land of Possibilities?*, and *Fruit Farmer*, a range of questions emerged through the theoretical discussion of LBG. These questions were addressed through the design to the extent possible due to the platform and the resources available. The questions were initially divided into four queries in relation to different types of spaces. These were a variation of Böhme's four spaces in which intuitive space was disregarded in relation to design at that point. Instead, a social space through which players could interact and follow each other's state in the game was added. Thus, the four spaces were:

- Space of bodily presence/physical space
- Digital space
- Representational space (focusing on fiction)
- Social space

The research questions were not only about the relation between LBG and spaces but also concerned the player's overall experience. Hence, a fifth category, *practice*, was added to the four mentioned to enable greater precision. This category encompassed the play experience,

e.g., the possibilities and dynamics preferred by players, and practical questions regarding handling technology and barriers of participation were addressed in the design as well.

As mentioned, the five categories above affected the design of *Visions of Sara*. Another element that affected the game was testing it with the players. The purpose of the two first phases of design was to create a coherent LBG, find relevant topics for further research, and ensure that the design did indeed inquire about LBG elements. Before the premiere of the game, it was tested twice with help from two different people. The first is a woman who has lived in and around Odense for years. The second is a woman had never visited Odense before playing the game.

After the LBG had been tested and design changes made twice, it was inaugurated by a local politician at an event, its premiere. The local press attended, as well as the benefactors,[14] *DJEEO*, and others who took interest in the project. More important, we had arranged for four groups – in all, 16 players – to play the game. The four groups were A) four high school students; B) a family of four consisting of two teenage daughters and their parents; C) four young men from town; and D) four women from the library, two young adults and two middle-aged. These four very different target groups returned and gave a variety of responses. After the politician and the press had left, my focus turned to observing the players and I conducted an interview at the end. After the event, additional questions regarding the players' experiences of the game were e-mailed to the players. Seven of them replied (the family provided me only with one e-mail address). The immediate responses at the premiere, as well as the answers afterward, have led to further game revision and are now part of the data in the project.

4.5.3 Observation and Interview

Observations of players and interviews with players have been conducted. For the observations, I focused on what the players said and did. In particular, their experiences with the LBGs and locations were the center of attention. Hence, I examined how the players took part and chose their actions in the LBGs, and how they responded to the different ways the LBGs interfaced with locations.

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[14] *Udviklingsforum Odense* (Forum for Development in Odense) and *Odense Kommune* (Municipality of Odense).

DJEEO Education has been observed being played on several occasions. The first time was at a trade exhibition displaying educational aids in Roskilde, Denmark. Eight students participated, and one team was followed during the entire session. The second time was in a classroom in which one class competed against other classes with the goal of becoming the Danish *DJEEO* champions. This served as an introduction to the platform on which *Visions of Sara* is built, as well as more offering opportunities to observe players' behavior in the LBG.

As mentioned, Open Air Museum in Brede was visited a second time after playing it for observations. On this visit, two different groups from an 8th grade class were followed as they played *Land of Possibilities?*. An interview with the class was conducted after the game.

To gain insights from experienced practitioners, meetings have been held in San Francisco with the team behind *Go Game* (Wink Back Inc., 2008) who develop creative games played in the streets. This has also served the purpose to understand which issues they experience with creating experiences in everyday spaces.

Visions of Sara has been observed being played twice. The purpose of observing *Visions of Sara* being played and conducting the interviews about the experience was to gain an understanding of how players experienced the game and how they acted. In the observations and interviews, I focused on the spatial aspects of the game. Below, I elaborate how a lengthier focus group interview with the players of *Visions of Sara* was conducted.

Figure 29: Field agents interacting with the base agents during the premiere.
Photo: Anja Ankerstjerne.

The interview is considered semi-structured, as it is neither open dialogue nor structured questionnaire. It is conducted according to an interview guide with themes and suggested questions. The purpose of this guide is to ensure that the interview actually elucidates the LBG play experience (Kvale, 1997). Before the interview with players of *Visions of Sara*, focus areas were identified based on experiences from the games played and observations beforehand as well as the review, and various aspects highlighted by the theories. The

observation and interview were conducted to shed light on these areas. However, keeping an open mind toward emerging new themes and willingness to hear what the players believed to be important (Kvale, 1997) took on an important role. New themes could give way to new questions during the observation and

Figure 30: Base agents at the headquarters during the premiere. (Photo: Anja Ankerstjerne)

introduce possibilities for interviews that had not been part of the original focus areas. By preparing the questions in these five areas but remaining open to new themes, the interview relates to theory and can also open new perspectives.

Based on the questions, an interview guide that highlighted a number of areas was devised to serve as a mind map organized into these themes:

- Experience – describe, evaluate, progression
- Location – experience, fit, effect on experience
- Narrative – relation to location, effect on performance, significance for players
- Navigation – different perspectives on the same location
- Tasks – evaluation of tasks, relation to locations, strategies, difficulty, different roles in relation to tasks, learning about affordances
- Social – Relation to non-players, performance in public space, competition, collaboration, playing with friends or strangers

Below each of these areas, a number of perspectives were listed to help the interviewer remember to ask about different aspects of the topic. These were not formulated word-by-word in advance but instead were more broadly defined allowing space for conversation to develop in a more natural manner (Kvale, 1997). On the other hand, to make sure that the topics of interest would be at minimum touched upon, a mind map was established giving shape to an overview. The mind map allows the interviewer to jump between subjects, as the conversation flows. This permits one to be attentive to what the participants find interesting and important to discuss.

Players were recruited for the observations with *Visions of Sara.* The main criteria for selecting participants was that they liked to play games in general, they found the game's theme interesting, and they were motivated to participate in the interview (Kvale, 1997). In addition, we were looking for players older than 16 years of age, since the game, in terms of difficulty, was created for adults, and we wanted to let players be alone in the field without our undue worrying about their safety in traffic. Nine[15] participants were recruited for the focus group interview, and two had previously played the game. One of the players was an author who had experience in developing scavenger hunts for children and was interested in developing more games for the platform. One participant was a doctoral student with a theoretical background in gaming who was working on developing interactive systems for a museum. Two of the players were a couple; he had studied media science and she had studied history. Finally, two were librarians, both men, who were interested in learning about the game, because it was situated at a library. The players were invited to play the game and then to participate in a focus group interview about their experience.

The entire event was held in a room at the central library in Odense (*Odense Centralbibliotek*). The room is normally used for teaching and was arranged to accommodate this situation. Desks all faced the chalkboard and each desk had a computer. The computers had Internet access, and the game was set up, ready for the players to arrive. We had placed a video camera by the chalkboard, facing the players, which recorded the whole event. As a backup, the event was also audio-recorded to capture dialogue and the "aural tapestry" of the setting (Schrøder et al., 2003).

The event began with a presentation on how to play the game and an introduction of the game's story. One player from each group – the field agent – was equipped with a GPS and a folder, and sent out into the streets. A research assistant followed and recorded two of these field agents, one in each half. During the first half, she followed the woman in the couple, Tora, and in the second half, she followed one of the librarians, Claus. Before the event, all the players had been asked and agreed that they would be comfortable with being recorded.

As I did not want to risk the game to "go down," e.g., with the GPS units losing their connection during the event, I chose to stay at the library from where I could control and

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[15] Two cancelled before the event.

reboot the system should any technical problems arise. From this vantage point, the base agents could be observed as they played, meaning I was in the same room with the base agents listening to their conversation with their partners. The teams' progress and the position of the field agents were followed on the screens. Staying indoors meant that during the observation, I could hear only half of the dialogue between indoor and outdoor players for each of the teams. Neither could I see what field players were doing out in the field. Questions for the teams were noted during the observation, to check the interpretation of events, and to start discussions about concrete situations. This on-stage material consisted mainly of a descriptive account depicting play events, the player's bodily responses to those events, snippets of dialogue, and exchanges between players (Schrøder et al., 2003).

At half-time, when the field agents returned from the streets to the library base to swap places with the base agents, their immediate responses and engaged discussions regarding strategy and specific experiences during the first half was observed. The same process was repeated at game's end when the field agents returned to the base.

4.5.4   Treatment of Data

I have amassed many different types of on-stage data across a number of media: notes, photographs, and audio- and video-recordings. These data are connected to four different types of sources: my own play experience, the design process, observations, and interviews. Thus much of my data are not textual. However, in order to document it, notes have been written to describe events. When doing so, interpretations had already been made, and the immediacy of the event was lost. Most of the information collected as data is in Danish, whereas the dissertation and analysis is written in English. Some of the original meaning no doubt may be lost in translation. The parts used directly in the thesis have been transcribed and translated. After the events, more extensive field notes blending description and ideas, comments and interpretations have been made (Schrøder et al., 2003) in both Danish and English. Through these notes, the analysis has already started. Some of these ideas are reflected in the design of *Visions of Sara*. In DBR, "analysis is conducted simultaneously with data collection and coding to improve the design and to address theory-generation goals" (Wang & Hannafin, 2005, p. 17). However, the more in-depth analysis of situations did not take place until after all of the fieldwork was conducted. When processing the audio and video data, meaning categorization has been used to construct an overview of data. Meaning

categorization is performed by assigning codes to chunks of data in which relevant statements or actions are found (Kvale, 1997). The research questions determine relevancy.

The scientific application *Atlas ti* (Development GmbH, 1991-2009) was used to manage and code data. Regardless of whether data encompass video or audio recordings, text, or photographs, a code can be assigned to a part of it using the program. Two examples will illustrate. The code "agent not needed" has been used when a player in the field in *Visions of Sara* responds to not being needed or not being able to do anything to affect the game-state. This code is used 18 times throughout the various data sets. The code "active agent" refers to situations in which the player responds to being able to make active use of the physical environment. This is used 38 times. These codes can be used to find examples of either situation; situations in which both codes occur or none of them occur can also be found via the system. When all data have been coded, a "chunk" of data can be selected and display which codes have been assigned to this selection. Finally, a search across the data set can reveal which kind of code co-occurs with, e.g., the code "active agent." Thus, topics can be explored and linked.
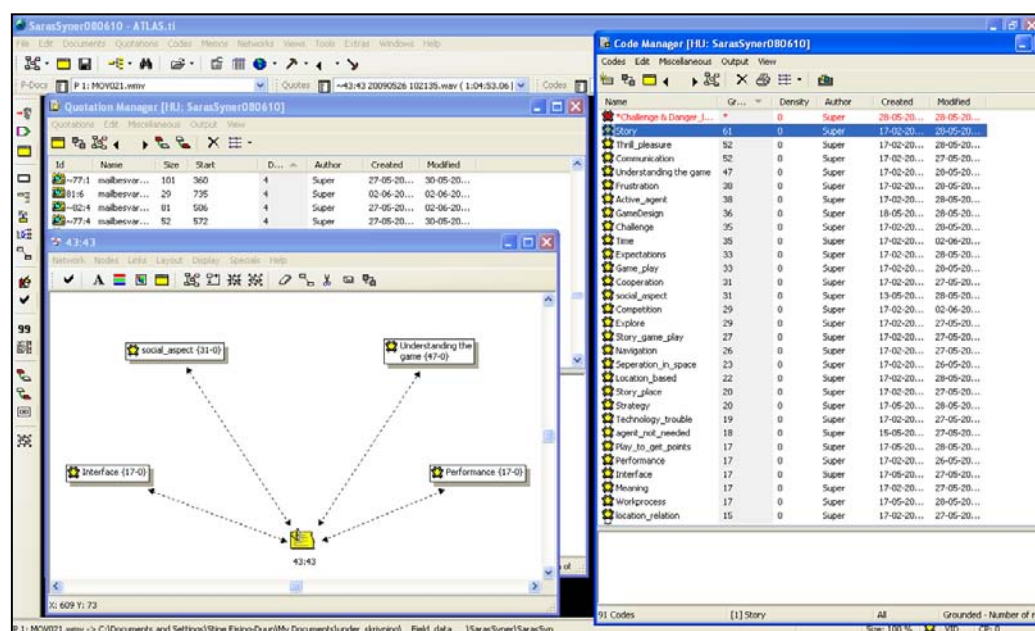
Figure 31: *Atlas ti* allows the user to code pieces of data (quotes) and to search across data sets.

From the outset, a small set of codes was created. Some of these prevailed throughout the process, but most of them became more specific as they were used. The initial set of codes grew out of the inquiry, the theoretical background, the play- , and design experiences. In most cases, the codes were too general from the outset and had to be refined to capture the

essence of a concept. The objective is to maintain a focus on the phenomenon of interest, but at the same time to leave room for new aspects to reveal themselves. Thus, new codes emerged in the process and the ones created at first were refined during the coding process. In this way, the number of codes also developed over time whereby I created new codes, refined some, and abandoned others.

Codes serve to identify, classify and compare, sort and systematize data, so as to yield explanations (Schrøder et al., 2003). In other words, codes work as advanced bookmarks that help extract, compare, explore, and reassemble meaningful pieces, quotations, and other useful connections from among the pool of data. The main part of the analysis took place while examining the data via transcribing it, coding, defining, and redefining code. During this process, certain chunks of data emerged as particularly interesting, difficult to grasp, or surprising. If these chunks were audio- or video-recordings, they were transcribed. The transcription of interviews focused on the players' words; in case of video, non-verbal communication was described if it provided information that changed or emphasized a statement's meaning. Interjections such as "eh," "oh," and intonation patterns present the oral interview have not been not transcribed, because the focus is on the content not the social and psychological aspects (Kvale, 1997). Photos have not been analyzed but merely used to remember the scene, weather conditions, people, etc. in support of field notes and/or video or audio recordings. Both the transcriptions and the raw data were entered into *Atlas ti*. This meant that during the analysis I continuously returned to the recordings themselves, not only to the text. Re-experiencing these recordings and seeing the original on-stage notes sometimes led me to recode chunks that had not been coded previously and even to alter codes. Raw data were thus continuously reviewed to aid in remembering the situations as dynamic living events in a context, not as a final text unrelated to what went on before and after (Kvale, 1997).

In analyzing data, the focus has been on the content of what is said and done, and not on analyzing the person doing or saying it. In this way, players serve as informants rather than representatives and objects of analysis themselves (Kvale, 1997). Attention has been paid to patterns of utterances from one person, and whether informants were negotiating meaning and what this meant. Sometimes, informants were asked to reflect on whether a statement made of another informant would apply for them, and thereby relating the statement to their own actions and opinion. For instance, one informant noted that she did not like the pace in

Visions of Sara. After having asked why she did not like it, another informant who used pacing as his main strategy was asked how he anticipated pace to find out what his choice of strategy meant.

In this study, it is not LBG play practice that was observed, as these players had not played LBGs before, and there were no observations of the playing of successive games. For example, *Visions of Sara* is played through two hours and it is a game of progression; thus, it does not invite successive games. Thus, only two players had played *Visions of Sara* more than once. Players are thus responding to a phenomenon not necessarily familiar to them.

In interviewing players, the goal was to avoid asking too much about topics to which they would need to imagine answers, such as how to design the LBG differently. I did this to avoid having too many statements that rested on belief and imagination, instead placing the emphasis on the players' actual experiences and behavior in response to the game (Boswijk et al., 2005). However, some of the players made suggestions for alternative designs, and some of these statements were interesting. Ermi and Mäyrä call for caution when interpreting such statements, since "players are not designers and therefore their statements cannot be considered as such" (Ermi & Mäyrä, 2005b, p. 6). While players' claims may be correct, e.g., that the game-play is more important than the theme (Ermi & Mäyrä, 2005b), this statement depends on when in the process we ask them about the importance: If they are choosing a game, the theme is perhaps more important than the game-play. This means that interpreting players' statements and relating them to design without observing their responses playing the game can increase misinterpretations of data. This makes it challenging to bring interpretations of the data to the application of results in design (Ermi & Mäyrä, 2005b), and accordingly, to deriving new insights. Finally, the researcher must try and listen to what is said from the perspective of the informant without prejudice (Kvale, 1997), which also means not trying fit the statements of the informant into a preconceived theoretical framework.

It has now been presented how the relationship between LBGs, locations, and play is studied in this dissertation. Together, the theories, review, participation, observations, interviews, and design form the basis for analyzing the phenomenon. The next chapter presents the process and background for the inquiry-based design.

In this chapter, an overview of the design process for creating *Visions of Sara* is presented. The design of *Visions of Sara* is based on this dissertation's inquiry; namely, the game was created to explore an LBG and spatial aspects in this relation. *Visions of Sara* is also part of a practice and has been running for over two years at *Odense Centralbibliotek*, the central library in Odense. The game is a site-specific LBG in which multiple players cooperate in groups that compete against other groups. The storyline is divided between in the Middle Ages of the 16th century AD, and the present day and involves ghosts, mysteries, riddles, and a murder. This chapter will present the design's empirical and theoretical background, and describes the creation of *Visions of Sara*. To begin this chapter presents the *background for design* of *Visions of Sara*. The first part introduces the pre-study of two LBGs that were played before creating *Visions of Sara*. These LBGs are analyzed using the theory presented in Chapter 3. This pre-study influenced the final design. The second part presents the *design research process*. Here I offer an elaboration of the design and research goals, the platform on which it is based, the setting in which it is designed and played, and the phases of development.

5.1   Background for Design

The intent was to create an LBG in which the players must investigate details at locations, one that encourages them to see their environment in a new way and to feel the atmosphere of the environment. Further, the LBG should direct the players' attention toward their physical surroundings, not to a screen, and make use of the richness in these surroundings not blocking them out. It has also been an aim to explore whether new patterns of perception developed during the game, i.e., if the LBG affected players' intuition and approach to perceiving the environment, and finally to try out different ways of relating to locations through design. Given these aims, and since *DJEEO*'s platform is developed for creating LBGs that relate to specific locations, it was fitting to design a site-specific LBG whereby players could relate to specific objects in a location through the game. In order to develop this LBG, collaborators, financial support, and as it was intended to be a site-specific LBG, an interesting place in which to set the game were needed. The collaborators have been the local library *Odense Centralbibiliotek*, which agreed to host the game; the municipal

government of Odense, which helped with marketing and funding applications; and *DJEEO*, which offered technical assistance and put their platform at my disposal.

DJEEO's technical platform encompasses GPS, the Internet, and mobile phones. Apart from the technical set-up, the platform includes a game concept described further in this chapter. *DJEEO*'s initial product, the educational game *DJEEO Education*, is running throughout schools in Denmark, Norway, Sweden, and the United Kingdom. According to the description on *DJEEO*'s webpage,

> *DJEEO Education* is a GPS-based learning platform that can be used with all subjects. With *DJEEO Education*, you get curricular learning, health through exercise, motivated pupils, and personal development for the pupils and older students as well. A game works as a virtual orienteering competition with built-in curricular assignments. It can be used from 10 years and up and is also relevant in special schools and for older and adult students. (DJEEO, 2010)

Unlike *DJEEO Education*, *Visions of Sara* is not a formal learning game created for an educational context. *Visions of Sara* is about experiencing fresh aspects of the town of Odense and experiencing pleasurable arousal in doing so. *Visions of Sara*, however, does provide informal learning via getting to know Odense and parts of its history. This connection between town and game made *Odense Centralbibliotek* interested in accommodating a "control center," and it agreed to be responsible for lending the equipment to the players. Their goal was to make other types of resources available to their users and to expand the library into the streets of town. In order for them to accommodate the game, it had to be self-explanatory, so that players could enter and engage in it without introduction from the staff. These differences between the initial platform and the requirements for *Visions of Sara* meant that additional development of *DJEEO*'s platform was needed, which required funding. We were fortunate to receive funding for the project.[16] The objective for the benefactors was twofold: 1) to allow the game to become a test bed for further development of LBGs that

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[16] From *Udviklingsforum Odense* (Forum for Development in Odense) and *Odense Kommune* (Municipality of Odense).

could attract game developers.[17] In addition, another consideration was to ensure that the game could attract players to make it appealing for developers; 2) to promote Odense as a "playful city"[18] as a part of a marketing campaign for the town. We agreed on the terms of the project.

Visions of Sara was not developed simply to expand the library into the streets, or to make Odense interesting for game developers and promote the town. The primary reason for developing this game was to inquire about LBGs. This inquiry is based on an empirical and theoretical background. This background is presented in the next section, in which the theoretical framework is applied to two LBGs. These will show two ways of using locations and space in LBGs, and the ways these uses influenced the design of *Visions of Sara.*

5.1.1 Analysis of Two Location-based Games

Through the analysis of *Land of Possibilities?* and *Fruit Farmer,* two ways of using and constituting locations in LBGs are demonstrated. These LBGs are not exhaustive examples for all LBGs, but they do relate to locations in different ways: *Land of Possibilities?* uses locations as a setting for the story that enhances the atmosphere in the game, while *Fruit Farmer* uses the physical space as a scene for the player to perform and explore the relation between physical and digital space.

Land of Possibilities? is an LBG that uses mobile phone and GPS technology. The game is located at the *Open Air Museum (Frilandsmuseet)* in Brede, Denmark (Nationalmuseet, 2011). The game is targeted at educational use. In *Land of Possibilities?*, players cooperate in groups of two to four persons. Each group takes on one of eight roles available. These eight "avatars" represent young people living at the end of the 19th century who want to go to the United States, hence, the name of the game, *Land of Possibilities?* These eight characters have different characteristics, abilities, and goals. They come from different backgrounds: Some are rich; one is poor; some are popular, some not; some are smart, others dumb as can be. There are

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[17] Ten games have now been developed on the altered platform, and *DJEEO* is currently trying to develop a version of *Visions of Sara* that is not site-specific. Further, *Visions of Sara* now works as a showcase for *DJEEO* and has led to the sale of LBGs with similar game-play.

[18] This is a major theme for the mayor involving all aspects of town development at the moment (Odense Kommune, 2009).

eight roles to play and therefore eight possible missions to solve in the game. Three of these roles were experienced firsthand during the two times I participated in and observed the game being played by students. For instance, I followed a group of students who played "Thyra," a young, independent woman, quite uninterested in housework. Thyra is intellectual and is always ready to get involved in a discussion. She wants to fight for women's suffrage, and she dreams of becoming a writer at the women's movement magazine.
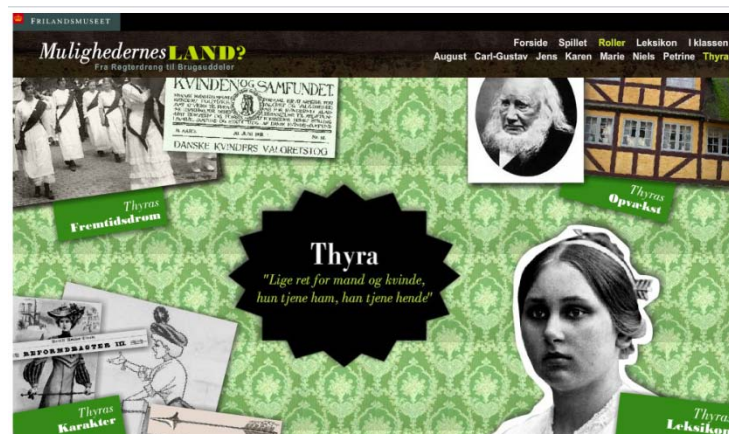
Figure 32: Screenshot from the game's website (Frilandsmuseet, 2007). This page presents Thyra and information about the women's rights movement.

These features of each character are reflected in the interaction with other in-game characters during the game and in the points given in three categories: money, social networking, and abilities. Each character has a different objective and amount of points from the beginning. The groups must end the game with 100 points more than they had in the beginning in order to fulfill the objective of the game. They gain and lose these points by navigating the story and finding "non-playing characters" (NPCs) represented on their phones by moving through the landscape, who might be able to help. Each NPC appears on the phone telling players a story, and either taking or giving them points in one of the categories. Through this game-play, the LBG challenges players' understanding of the historical period in which the story takes place along with their sense of direction. *Land of Possibilities?* uses the environment and authentic buildings at the museum as a setting for the story. The second game, *Fruit Farmer*, has another approach to locations.

Fruit Farmer, developed by *LocoMatrix* (2007) is an arcade-style maze LBG. What makes the game location-based is that the player actually needs to move through physical space to move his/her position in the maze on the screen, with the game's outcome dependent on the player's actual locations. The play experience also depends on the spatial features of the players' surroundings (Nova & Girardin, 2009); i.e., playing *Fruit Farmer* on a hill, in a shopping street, or in a park are three feasible options that would lead to very different experiences. Digital space is thus expanded into physical space, which is turned into a space

of interaction. This interaction can happen in a group of up to eight players or the game can be played individually. Players fight to collect the most digital fruit without being surrounded and stung by digital wasps, after which they must reach the safety of the digital barn. The game space on-screen is limited spatially by the sides of the maze displayed on the smart phone's screen. In the physical world, the digital obstacles and the limits of the game space are invisible, whereas the physical obstacles, such as walls, fences, and bushes are apparent. Players

Figure 33: Screen shot from *Fruit Farmer*.

must look back and forth from the screen to the physical environment to navigate through the maze without running into things.

The physical space has significantly different roles and meaning in these two LBGs. In the next sections, *spatiality*, *structure, interface*, and *player experience* of these games are examined via the theoretical framework provided in Chapter 3.

5.1.1.1 Spatiality

The experiential aspect of space is concerned with the elements in a space that affect the player's body and the atmosphere that the player experiences at the given space (Lamm, 2002). In *Land of Possibilities?*, this is expected to play an important role, as the players are in a museum that involves the senses of the player: Players can see, touch, smell, and move through authentic buildings from various periods of Danish history. *Land of Possibilities?* draws on the affordances of the location using these buildings as a setting for player performance. For instance, the players playing the character Karen have their first stop at the poorhouse, a shabby structure, sparsely furnished and decorated. This is the home of their character Karen. The physical location and story enhance each other. The story becomes sensuous and the physical location enchanted, i.e., part of the story. There is a fit (Kristiansen, 2009) between the story and the location – in this case, the poorhouse. This example shows how *Land of Possibilities?* is site-specific, as it was created for a specific location (Kristiansen, 2009), and this location has a high relevance for the game-play, for it integrates physical and cultural properties into the game (Reid, 2008).

On the other hand, *Fruit Farmer* is location free, as it is not linked to a particular location. It uses the dichotomy between physical and digital space as part of game-play. In *Fruit Farmer*, digital elements are assigned to positions in physical space; thus, *Fruit Farmer* merges digital space and physical space. Digital space is projected onto physical space, as the rules of the game and the distributed information in digital space affect the movement in physical space. Consequently, the player experiences the relation between these spaces as he/she moves around in physical and digital space concurrently. Physical and digital spaces are separate spaces as in mixed reality, since the maze on-screen does not fit the physical space. Players explore the physical and digital world in conjunction, a defining feature of locative media (de Lange, 2009), exploring the relation between the representation (map) and its referent. Looking at the map, players experience the physical space from a bird's eye view by looking at their device screen while their movement on Earth is reflected back to them. They are "writing" and "reading" space as they perform in space and relate to its structure concurrently (de Certeau, 1988). They are *experiencing* the space as a hybrid space.

Figure 34: The editor of *Fruit Farmer* allows players to build mazes. They can add obstacles, fruit, wasp's nests and the start and end of the maze (LocoMatrix, 2007)

The layout of the digital space in *Fruit Farmer* is represented on the screen as a map. This design communicates the idea of an arcade game and thus does not try to blur the idea that it is a game. The map in *Fruit Farmer* does not depict the structure of the physical space that the player is going to navigate. Players need to map real-life obstacles, such as buildings, streets, etc. to navigate through the maze while playing. The scale of the map in relation to the physical space in which players are playing has influence on game-play. Often the fruit is placed far apart in *Fruit Farmer*, which means that the game loses its intensity. In *Land of Possibilities?*, the NPCs are mostly close to each other, although there are a few stretches with a greater distance between them, which again lowers the game's level of intensity.

Fruit Farmer provides an alternative experience of physical space, as it lets players move into areas that they would most likely avoid, and move in ways they would not move if it were not for the game. Depending on the spatial affordances of physical space, this might be fun, annoying, or even dangerous. This became evident when I played the game: Fleeing from *digital* wasps, I found myself running through *actual* thorny raspberry bushes and stinging nettles. In this way, players of *Fruit Farmer* are affected by the topology of physical space (Nova & Girardin, 2009), and thus *Fruit Farmer* appropriates space due to spatial properties (Reid, 2008). Conversely, the game-play in *Land of Possibilities?* is not dependent on topology, as it would not change the player's possibilities in relation to playing the game if the museum grounds were, e.g., a bit hillier. Because it is a site-specific LBG, it is designed for the location's specific properties (Reid, 2008).

A defining feature of LBGs is that their play-space encompasses not only physical space but also coded, digital space. In these two LBGs, using code provides the opportunity of, respectively, adapting digital information to the location in which the LBG is played (*Fruit Farmer*) and adapting the content to the situation (*Land of Possibilities?*). *Fruit Farmer* distributes information – fruit, obstacles, barn and wasps – onto tangibility space depending on the player's location (Walther, 2007a). The information is arranged by a designer or player beforehand, but the game adjusts the layout to the dimensions of the space in which the player finds herself. In this way, players avoid having fruit placed where there are buildings or a lake – given that this geographical information is available to the game system. In *Land of Possibilities?*, players are not collecting fruit but finding NPCs, which the designers have distributed on the museum grounds close to buildings that are relevant to that particular character, and the story this person is telling. NPCs offer different responses depending on which character the group is playing and this variability gives depth to the game, and makes replay with another character a very different experience. Players combine these fragments of the story while navigating through the grounds. Thus, players are creating the links between unrelated encounters through their movement and choices (Hayles, 2004).

Mediating the museum grounds and random public spaces by distributing and locating information onto them, LBGs provide a new way of appropriating and understanding these spaces (Dourish, 2006). *Land of Possibilities?* was designed to motivate students to actually visit the buildings, which, according to the game instructor, they do not do without the LBG. But the LBG does not aim only at motivating players to move around; it also provides a historical

context that helps players "read" the buildings through a certain perspective. This is the perspective of the character they are playing, and the information about Denmark at the end of the 19th century that is given to them. Players of *Fruit Farmer* can negotiate the use of space and a performative appropriation of public spaces for sport by playing the game. Depending on the legitimacy of context (Brewer & Dourish, 2008), this can be more or less ambiguous (Gaver et al., 2003) and controversial. *Fruit Farmer* asks what the secret gaming affordances (McGonigal, 2007a) of any public space are, letting players explore this concept: Can a shopping street, e.g., become a stage for play? Used in this way, *Fruit Farmer* challenges social codes and norms relating to public space and the nature of acceptable behavior in the public sphere (Stenros et al., 2007). *Land of Possibilities?*, on the other hand, asks about the gaming affordances of museum buildings for teenagers.

5.1.1.2   Structure

LBGs are set in multiple frames with *Land of Possibilities?* and *Fruit Farmer* being no exception. In *Land of Possibilities?*, actions of players are at least related to three frames: Players are visitors at a museum, they are students learning about a historical period, and they are playing a game. In *Fruit Farmer*, the frames that players act within depend on where and when they play the game and who is around them – if they play in a park, their actions relate to the rules and legitimacy of the park, the activities that go on in that space at that particular time, and to the frame of the game concurrently. Players' actions matter not only in the frame of the game, but also they relate to the context in which they are played (Borries et al., 2007a).

The frames affect how players interpret the locations they visit, and their behavior in everyday space. In *Land of Possibilities?*, it is the story in particular that frames the locations players visit. In the game, the buildings are no longer mere museum artifacts; they are a setting for a story and a scene for participation. In this way, for one of the groups the mill is a place to get a job, and the rules constitute getting a job as being important for this group. Thus, going there is meaningful. By rewarding players when they find fruit and by punishing them for being stung by wasps, *Fruit Farmer* constitutes the acts of "search" and "escape." In *Fruit Farmer*, it is particularly the constitutive rules that frame a bush, e.g., as an obstacle when fleeing from a wasp. Players can use this narrative frame as a guideline of how to act in the game: Being situated as *Fruit Farmers,* players can assume that harvesting fruit will net awards for them. Wasps sting and they eat fruit, too; thus, these should be avoided.

In *Land of Possibilities?*, players assume a role, that of a young, hopeful woman or man who creates a path among buildings that hark back to another era. The paths start at the characters' respective homes and then wind around the grounds, as the players choose where to go. These are decisions players make based on the information gleaned from NPCs, their judgment of this information that can sometimes be ambiguous, and on their motivation. This means that when the group playing the character Thyra, who is fighting for women's rights, hear that a neighboring farm's rich owner has a reputation for violence behavior and loathes rebellious women, then the group needs to decide whether they will take the chance of meeting him to earn some money, or avoid the farm entirely. The guiding principle of how to move around is to go where the story indicates that players can gain points in the three categories: money, network, and abilities. These three categories constitute which actions are meaningful in accordance with the objective. Thus, the rules and fiction guide the players' movements and actions.

In both of the LBGs, players are encouraged to aim at earning points to win the game. *Fruit Farmer* with its simple game-play, short sessions and lack of story is a particularly ludic game that revolves around competition, advancing in and conquering space inducing a game-mode (Walther, 2007c). *Land of Possibilities?* measures choices in terms of points; however, players must also engage in the story to find out what will be rewarded in this universe. The characters also have some personality traits, which makes it possible to identify with them, and sometimes to pretend to be that person. Players also need to be explorative and improvisational, as they map the museum grounds through adventurous discovery (Walther, 2007c), which means that *Land of Possibilities?* places a greater emphasis on paideia play (play-mode), while still being a ludic game.

LBGs frame locations and actions; however, their frames are not explicitly externalized, which means that players must negotiate them during play. Both fiction and rules are part of the frame as shown. The rules of the two LBGs do not describe the exact limitations and affordances of the games, as Juul (2005) claim rules do, nor are they beyond interpretation; thus, they do not fit the rules defined by Salen and Zimmerman (2004). In *Fruit Farmer*, actions such as tackling opponents or using a remote controlled car to move the GPS around to the locations of fruit are not regulated through the game. In this relation, players must negotiate the game's frame themselves.

Within the frame of the game, players' attention is drawn toward and away from something (Bateson, 2000). The attention of players in *Land of Possibilities?* is directed toward the values of different movements in the era that the game portrays, and particularly toward the position of NPCs. Whereas *Land of Possibilities?* draws the player's attention toward the story and location of NPCs, *Fruit Farmer* directs the player's attention toward the correlation between digital and physical space, and the bodily experience of moving in both spaces concurrently, e.g., feeling dizzy and disoriented. Attention is drawn toward the distributed information and physical obstacles, and away from the "normal" paths in that particular space. Players are running for the fruit, not following pathways. While playing the two games, the player's attention is blended between this physical environment and digital space (Gustafsson et al., 2006), as the player must keep an eye on his/her own position, movement, and the position of the distributed information on the screen. However, in both games, the screen demands the most attention, and little attention is drawn to exploring physical space, although the game-play in *Land of Possibilities?* is about exploration with the game's intent to have players experience history and buildings on location, as indicated by the instructor.

5.1.1.3 Interface

In both LBGs, information is represented on the screen of a location-aware device. In *Fruit Farmer*, each player has a smart phone with the built-in GPS and the game pre-installed. The GPS tracks the player's position in physical space and then displays it on the phone-screen's map. On the map, the player can also identify the position of the killer wasps that harm the player if they are in close proximity, the "juicy" fruit that gives points when collected, the obstacles hindering players moving in digital space, and the barn. In *Land of Possibilities?*, each group has a PDA with a built-in GPS at their disposal, with which they can see their position, find relevant locations during the game, and receive information. The PDA-screen shows players a map of the area, and on the map, their own location is displayed as a small arrow. Points of interest, NPCs, are represented by blue dots. NPCs can offer information regarding who and who is not helpful, and indicate the position of other NPCs. The players do not know who (friend/foe) is represented by the blue dot before they walk into the zone where an NPC is, and a picture of the person is shown on the screen, accompanied by a sound clip. When the blue dot is "activated," the players cannot do anything to avoid the consequences of the encounter. In relation to the two LBGs' affordances, they are not infinite. Neither do they involve interacting with objects in the environment, nor do they

directly encourage players to perform. The action in the game is performed through the position of the PDA. This means that the player holding the PDA has a more direct influence on the game-state than the other team players. In conclusion, player input in both LBGs is limited to movement in physical space.

During *Land of Possibilities?*, players spend considerable time looking at the screen to orient themselves about the location of NPCs as well as their own. Still, the surroundings are used for the players to get their bearings (Nova & Girardin, 2009) in combination with the information provided and their objectives. This is why the group that plays Karen from the poorhouse goes to a prosperous farm when they need money. They meet a woman at a farm who cannot give them a job, but perhaps her husband can. The woman indicates that the man of the house can be found by the creek. If players know where the creek is, they can walk toward it and when they are close enough, a blue dot will appear on the screen. From the information given, they can then presume that this is indeed the man of the house. When the group walks toward the blue dot, they will experience that when the mobile phone is at the same location as the blue dot on the map, a sound clip will start to play and an image of the man speaking is displayed. Thus, the location and story in *Land of Possibilities?* are used for navigation. However, the players do not have to interact with or examine the buildings in order to play the game. In addition, they cannot interact with the NPC: they hear sound clips, but they can ask no further questions nor offer a reply.

5.1.1.4   Player Experience

Mobility is a central component in the game-play of the two games. In *Land of Possibilities?*, the player must demonstrate that he/she understands the story and then choose to move toward the locations indicated in the story that can help the character they are playing. In *Fruit Farmer*, the player must keep a close eye on the state of the screen and then move around in physical space to avoid wasps and gather the fruit. The game directs the attention to the bodily experience of spatiality, and places an emphasis on performative involvement (Calleja, 2007) of the game structure, as players learn how to move, and this movement needs to become internalized and fluent. The player must imagine how the represented space unfolds to use the representation for in-game actions. *Fruit Farmer* is also about spatial involvement, as she/he is learning how to locate him- or herself in the digital and physical game area (Calleja, 2007). Thus, players are appropriating space for spatial purposes without being put on the line.

Moving around playing *Fruit Farmer*, fixedly gazing at the screen, avoiding obstacles in digital and physical space, the player will feel disorientation or even dizziness. These bodily experiences are part of this game experience. *Fruit Farmer* is designed to challenge players' sense of navigation and agility. The game plays upon a bodily play dynamic focusing on the corporeal self – its limits and possibilities – that challenging the players physically. The interface works as a liminal object – but not only between external reality and mind as Murray (1998) suggests – rather it is between external reality and the players' perception encompassing the whole body.

Land of Possibilities? is about spatial involvement, too, as players must navigate and move around the museum grounds. However, the emphasis is on narrative involvement, as players follow the story and identify with the characters they play and encounter. They incorporate the narrative when they use it to act from, and sometimes even act out the role of the person they are playing in the group. Players can also experience affective involvement, because the feedback players experience from NPCs can affect their mood and emotional states (Calleja, 2007). This happens when players experience that their "character" is treated in a harsh way by the NPCs. According to the instructor of the game, often groups who played Karen felt provoked, as several of the NPCs refuse to help a pauper from the poorhouse. Although they are not real people, their opinion of, and response to the character means something to the players.

The social aspect encompasses possible collision or meeting points, the possibility to preserve the intimate sphere, and the possible communication paths. In *Land of Possibilities?*, players play in teams who walk together through the museum grounds. They often meet other groups and exchange information on the NPCs and directions with these or taunt each other or ask about scores; in fact, they are encouraged to do so throughout the game. However, it is difficult for teams to compare their scores during the game, as they are functioning as characters with different amounts of points and only have access to the scores through each other. This means that the sense of competition is low, although the players I followed speculated and discussed how their performance could be compared with that of other teams during the game.

Whereas players in *CYSMN?* and *BotFighters* compete without seeing each other, and players in *CatchBob!* cooperate by being in physical space yet separated by distance, in *Fruit Farmer*, the players are playing on the same "field" in the vicinity of each other. They are fighting to reach the same thing: the location of the fruit. This means that the players are in direct competition. They can use their bodies when they meet to fight for the fruit, which results in a very direct contact between players. This competition promotes a shared involvement in the game (Calleja, 2007). Even so, both games remain difficult for outsiders to enter, as they require the right equipment.

Land of Possibilities? gains distinction by having a well-written and performed non-linear story that is distributed in physical space, so that players can create links between its pieces as they please by moving around. The ambience of the authentic buildings is used as a setting for this story, and therefore the buildings are not just buildings but are placed in a historical context. However, these surroundings are not used as a part of the game-play, and the players hardly interact with it. Although the game causes players to move around between buildings, mostly they miss experiencing the interior of the houses. Actually, most of the time, players who have access to the interface pay more attention to the points given and location of blue dots between meeting NPCs on the screen than to the buildings. This interface is shared, which means that some players are more or less left out while they move between NPCs. When players want to make a decision whether to encounter an NPC or avoid it, they often do not have information about the NPC, which means that the interaction can seem a bit coincidental.

Fruit Farmer adapts the outlay of game space to the physical surroundings, making it playable almost everywhere. The game plays with the relation between physical and digital space, as players navigate both using their bodies. In this way, the game experiments with a new kind of interaction. *Fruit Farmer* enables direct, physical interaction with other players who can collide and compete in physical space. The game does not adapt the level of difficulty to the skills of each player, which means that players need to be in similar physical condition to compete on equal terms.

Both games require the player pay considerable attention to the screen.
LBGs have previously been criticized for having too much focus on technology (e.g. Gustafsson et al., 2006; Kristiansen, 2009, 2010; Montola et al., 2009; Waern et al., 2009).

Inclusion of and interaction with surroundings is a defining feature of LBGs (Mäyrä & Lankoski, 2009), and thus players can expect that LBGs will create a framework that enables a meaningful interaction with the surroundings. The goal of *Visions of Sara* is to explore how to create such a framework.

5.2   Design Research Process

Visions of Sara takes its point of departure in theory and empirical experience from the two games analyzed above. It is created to inquire about LBGs. The genesis of *Visions of Sara* is part of the empirical data in this project as well as the game itself. Before creating the game, *design and research goals* were set and the *platform* with which the game was created was chosen. I present both in this chapter. I describe the *setting* in which *Visions of Sara* was played. Finally, I explain how *Visions of Sara* developed through three *phases*.

5.2.1 Design and Research Goals

LBGs have the opportunity to mix digital and physical media, and frame events and actions as ordinary and playful, as well as use fictional and authentic elements. *Visions of Sara* lets the players explore Odense, the town in which the game is set, from different perspectives, playing with the differences between these dimensions.

In *Land of Possibilities?* and *Fruit Farmer*, the attention of the player is to a large degree fixed on the screen. Objects in the physical surroundings are not part of game-play. To explore the relation between objects and play, and players' interaction with their surroundings through the LBG, *Visions of Sara* is designed to guide players to interact with their surroundings – not a screen. Through framing, that uses both narrative and game mechanics such as rules and objective, *Visions of Sara* draws the player's attention toward her surroundings. In this way, the expectation is that the game will serve as a framework for creating a meaningful relationship between player and locations. The frame should also provides a premise (Bateson, 2000) that suggests to the players how to interpret the objects they meet. The aim is that *Visions of Sara* can be used as a tool for changing the perspective of players, so that they will experience Odense in a fresh way. Thereby, both the game mechanics and the framing of the game, and how LBGs affect the players' perception of the spatial locations and objects in the game can be explored and analyzed.

LBGs are claimed to bring fiction into the everyday world (Benford et al., 2006). In order to explore how the everyday world could be influenced by the fiction and vice versa, *Visions of Sara* plays with the dichotomy between authenticity and fiction, enchanting the real world, as Montola (2005) expresses it. Thus, real-world objects are integrated into the game-play and the story of the game. This also offers opportunities to explore how the player interfaces between object and game (Nieuwdorp, 2005), and the concepts of apophenia (Dansey, 2008), and coincidences (Reid, 2008).

We interact with the world and understand it through our body (Merleau-Ponty, 2002). If we send players into the street, we must make use of the physical space, so that it relates to game actions that can be used to build up a mood and reach the goal of the game, i.e., it all must be part of game-play. This is attempted through the design of *Visions of Sara*. In the previous section, we saw how an LBG can be used to create disorientation and dizziness and how the smell at the poorhouse affects player motivation. Hence, the designer of LBGs should consider the player's bodily participation through moods, perceptions, and actions. In relation to moods, in *Visions of Sara* the physical space is used as a setting for the story, tapping into both the atmosphere of the place and its physical layout. This is done to affect the mood and sensuous involvement of the player and explore these aspects. In this way, the design can be used to inquire about how experiential aspects of physical space play an active role in the game.

The possibility of using time as a factor by which players are assessed is kept from the original game in order to study both play-mode and game-mode in the LBG. It induces the competitive spirit, as it is easy to compare between teams, and players know how to adjust their strategy in order to perform better: Speed up! Another practical reason for keeping the deadline is to organize the completion between teams, so that players would be at the control center at the same time, and not have to wait for each other.

As we saw through the analysis of *Land of Possibilities?*, one player "owned" access to the game through the device, and thus players experienced being left out at certain points. Players who played *DJEEO Education* in teams of four, point out this aspect, too, as there were not enough tasks to solve for all members in our team. This means that the players who are left out feel less attached to the outcome of the game, and some even felt unmotivated.

Visions of Sara is designed with a focus on letting all players have access to influencing and thus feel attached to the game's outcome.

The issue of not having access to the interface can be addressed by giving players different perspectives and positions in relation to play. In *Land of Possibilities?* and *Fruit Farmer*, players have a bird's eye view (the screen) while being in space, and also can explore the relation between digital and physical space. By separating the bird's eye view provided by the digital map and being in physical space in *Visions of Sara,* as it has been done with *Frequency 1550,* it is possible to interview about and observe how players negotiate the relations between these perspectives and media.

In sum: *Visions of Sara* is intended to be an LBG that

- Allows players to interact with their surroundings
- Enables players to play it without having their main focus on a screen while being in the town
- Integrates real-world objects into the game-play and in the story of the game
- Uses physical space as a setting for the game, tapping into the atmosphere of places and the physical layout, and thus lets physical space play an active role in the game, involving the player's senses
- Lets players explore Odense through patterns of the game
- Lets all players have access to and influence on the game
- Provides separate perspectives on space

Note that the list of requirements focuses on the design related to LBG elements, as this is the main focus of inquiry. This means that other perspectives relevant to game design in general are not mentioned here. Since only one LBG is designed, there are limits to the features that it can hold. However, the dissertation's analysis includes the other LBGs that have been studied as presented in Chapter 4, "Methodology". These have different designs, which mean that more features than those *Visions of Sara* hold have been covered.

Kristiansen (2009) designed a site-specific game as a part of his Ph.D. project. His point of departure is his Site-Specific Game Performance Model that consists of three axes: 1) the relation between *game* and *site* that relates to how the site is used as game elements; 2) the

relation between *site* and *locomotion* that relates to how parts of the site influence locomotion; and 3) the relation between *locomotion* and *game*, that describes how locomotion makes the player progress in the game (Kristiansen, 2009). Apart from players' actions – locomotion – the requirements above also take into account the perception and interpretation of players, as they regard the player as perceiving and performing various actions. *Visions of Sara* is designed to explore player's meeting with locations and creation of meaning, providing them with different approaches to locations. Thus, in general both the design and the research in this dissertation inquire about the relation among LBG, location, and player (experience).

These are the design- and research goals that have influenced the creation of *Visions of Sara*. The game is built on *DJEEO*'s game platform, meaning that some design choices have already been made. This platform is presented in the next section to understand this point of departure.

5.2.2 The Platform

DJEEO's platform is not only a technical platform. It contains certain conceptual choices that limit the kind of game that can be designed with it. When playing a *DJEEO* game, players team up. One part of the team (the base agent) is at a "base" called the "control center," while the other player takes on the role as an agent in the field (field agents). This separation of players has been seen before in LBGs such as *CYSMN*, *URAAY*, and *Frequency 1550*. Using this separation, it is possible to explore how players create context of locations together (Flintham et al.,

Figure 35: Base agents (left) are in contact with field agents (right) via phone. GPS technology allows the base agents to track the location of field agents (Illustration from *DJEEO*).

2003). In *DJEEO*, the field agent carries a GPS tracking device, and the control center can see the field agent on a map and guide the agent from landmark to landmark. This differentiates the game from the three mentioned above, for field agents move around in physical space without a screen. This is interesting when one aims to let the field agent focus on his or her surroundings instead of looking at a screen too much. Another interesting aspect about the platform is that it enables cooperation, as well as competition, all of which make it possible to observe the social aspects of play. The core concept of the platform
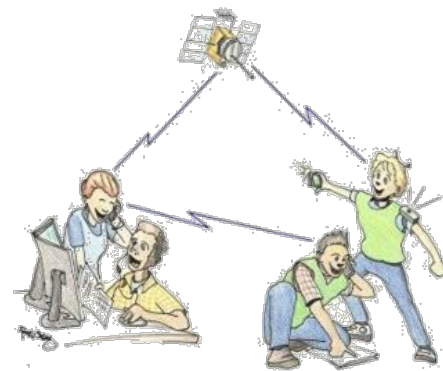
comprises team play, communication, cooperation, exercise, strategy, and navigation. Thus, it facilitates games that revolve around these elements.

Figure 36: Base agents instructing their partners via phone (*DJEEO* – joshuatree.dk).

The player at the control center, the *base agent*, is equipped with a mobile phone and a computer connected to the Internet through which a designated webpage can be accessed. This webpage displays a map of the area, mission information, and tasks. The base agent also has access to information about the location of the field agent, and the next location to which the field agent must go. A flag on a map on the computer marks this spot. Further, the base agent has part of the information for the tasks that need to be solved in cooperation with the field agent. Finally, the base agent possesses information regarding the state of the game in relation to the score of each team, the position of each field agent, and the remaining time until deadline before field agents must be back at the control center again. The game is played in two halves separated by a short break. Each team needs to "check-in" at the control center at half time and at the end of the game. During half time, the players can swap positions, so that the base agent becomes a field agent and vice versa.

The other part of the team – the field agent – is equipped with a mobile phone, a folder with information and a live GPS tracking unit. Using the Internet, the players at the control center can always keep track of the location of the agents. The mobile phones allow the players of the same team to stay in contact, the GPS tracks the field agent's position, and via the Internet, this position is

Figure 37: Field agents on their way (*DJEEO* – joshuatree.dk).

sent to the base. The folder provides the field agent with information on the tasks teams are solving. Finally, the field agent has access to the environment: He/she can see, touch, smell, and hear elements that are out of reach for the base agent.

As the game starts, the base agent can see the position of the field agent and a digital flag on his map at the computer. The task is now to guide the field agent toward the flag. Between the flags, the team solves "*route tasks.*" When the field agent reaches the location indicated by the flag on the base agent's map, the team receives points for finding it. They can earn additional points by solving a "*location task.*" The base agent enters solutions to route and location tasks into the game interface. Players solve the tasks by entering a text answer or choosing an option presented at the webpage. After this, the next flag is shown on the map, and the game goes on. Normally, there are eight flags in each half of the game. The platform allows the designer to decide the game duration and set the amount of points for each task and for finding flags. The game designer also decides whether the teams receive penalty points and the corresponding amount if they do not meet the deadline. Finally, the designer determines to which aspects the player should attend and can assign weight to the points based on that preference or leave out points entirely.

We now know the properties of the platform. This provided the design process with both limitations and possibilities. Another aspect that affected the final design is the setting for which *Visions of Sara* is designed and in which it is implemented.

5.2.3 Setting

Visions of Sara is set in Odense, the third largest town of Denmark. The old town was founded before 988 AD[19] and is rich with historical buildings and stories. The town was once the religious center in Denmark with monasteries, convents, and churches standing side-by-side. In historical times, it was even the royal seat for Denmark's kings and queens. *Visions of Sara* takes place in present-day Odense, which is connected to the 16th century through the LBG. In this way, the game changes the temporal horizon of space (Merleau-Ponty, 2002), relating places of the present day with places of the past. The link between present and past is Sara, the protagonist of the story. The players will find out that Sara is being haunted by a nun who was killed in the 16th century in Odense. In the game, they are following the trail of visions that Sara has had at certain locations in Odense. Her visions are based on locations in Odense and are created to guide players through the town. "Sara"

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[19] According to the museums of Odense (http://www.denfynskelandsby.dk/Historie/Odense_bys_historie.aspx), this was the year when the town was mentioned for the first time, but the town is considerably older than that.

would not exist were it not for Odense. The idea is to create an LBG that invites the players to experience Odense from a new perspective, offering players an alternative perception of everyday space that they can incorporate through play and involve their senses in a new way.

The players are not only exploring the streets of Odense during the game, there is a second setting: Half the time, players sit at the control center situated at the library *Odense Centralbibliotek*. The library is situated at the busy train station – which means that many people who would not normally frequent the library, according to the employees, come there to kill time. At the library, we also see groups of people who sit in silence and read, plus it offers an area where children can play. In other words, it is a multipurpose environment with a great variety of users. During the game, players sit upstairs in a "closed off" section so that they will not disturb – or feel that they have to show consideration for – users who look for quiet contemplation, although they are challenged to leave this post during the game. Because they are at a library, players have access to a vast amount of information, and they are in a setting used both for pleasure and for work.

Visions of Sara relates to these two settings – to the platform, as well as to the goals of research and those of the benefactors. The next sections present the phases through which *Visions of Sara* was created and the considerations behind its creation.

5.2.4 Design Phases

As DBR is the methodology used in this study, the game went through different stages of development, with its design refined according to player response and theoretical considerations. In this section, I present the three phases of development and reflect on the choices, the de-selections, and the changes made.

5.2.4.1   Phase 1: Creating the game

Visions of Sara is meant to shift the perspective from when players stroll through town or are on their way to work. In contrast to *Land of Possibilities?* and *Fruit Farmer*, the aim was to have players use details in their surroundings for solving tasks, and not to be only about movement. *Visions of Sara* draws the field agents' attention toward locations, framing these by the story and by the game's rules. In this way, players can develop and incorporate an intuition or pattern of perception to perceive their surroundings through play. This pattern

of perception is determined by the frame of the game that suggests how to perceive the elements the player meets. *Visions of Sara* frames physical elements that normally are unrelated to each other, tying these elements together and connecting them to a plot: A well is suddenly discovered as being a long-forgotten entrance to a secret passageway between a monastery and a convent linking the monks and the nuns. These elements do not refer to those they would under normal circumstances (Bateson, 2000), and the players must shift between the real-world meaning and the in-game meaning (Nieuwdorp, 2005).

The story in the game is created from the elements found in Odense. In other words, elements intrinsic to the environment are remixed, so that they will fit into the game. The game does not present strictly historical facts to the player, nor does it educate the player as to the history of Odense. However, it does offer authentic facts, such as the location of a former cloister and information concerning the era of the story. *Visions of Sara* is built on these metaphorical aspects that refer to stories or eras outside of the present (Lamm, 2002), which has been done previously in LBGs; examples from those presented in the dissertation are *Frequency 1550* (Admiraal et al., 2009), and *REXplorer* (Ballagas et al., 2007; Walz & Ballagas, 2007). Some of these metaphorical aspects retain their original meaning; others are given a new meaning within the frame of the game. As an example, the field agent must locate something that indicates what the woman haunting Sara is seeking. The field agent is standing on the square in front of the city hall and is told to find something in the area. The team has received a poem that hints at the Roman goddess of justice, Justitia (Figure 38). The poem provides ambiguous information (Gaver et al., 2003), but if the field agent with the poem in mind sees Justitia on the top of the roof, then he might conclude that the person haunting Sara is seeking justice. The statue is, of course, a symbol of justice, but in the game, it is also part of one of Sara's visions and thus a message from the woman haunting Sara conveyed to the players through the poem.

Figure 38: Justitia rises above the square

To explore how fiction and everyday space can be related and authenticity used in LBGs, a narrative frames the actions in *Visions of Sara*. The narrative can be used by players to

become involved, as they can identify with a role and a mission. The story can guide players through the game, as it makes a link between locations, tasks, and actions. Fiction in *Visions of Sara* is also augmenting locations it weaves (perceived) authentic facts about the location into the story, e.g., pointing out elements in the architecture, offering background stories, and hinting at layered meanings in ornaments. This is partly "narrativization" as locations correspond to a scene for the performance of "true" stories (Sandvik, 2008). However, overall it falls more into the category of a "mixed reality" augmentation of locations, since they have status of an actual location in the physical world *and* as a story space (Sandvik, 2008). Players of *Visions of Sara* experience these locations through the story and the use of technology; without following the footsteps of someone else.

The narrative of *Visions of Sara* is a crime story that also frames a certain behavior toward a location: Crime investigation is the act of finding evidence that suggests a series of events. In crime stories, plot and place converge (Sandvik, 2010). In other words, it is a plot, cut into pieces, and scattered around an environment. The location is coded – or framed – by the crime and the players need to decode the story (Sandvik, 2010). Because of this, it is possible to distribute parts of the story in the environment and let the players experience them in a different order than the chronological. Players are exploring a plot that has already happened and that has left traces at locations. Thus, the crime investigation is a fitting genre for an LBG built on a narrative that wants players to pay close attention to various details in the environment. In this way, the theme of *Visions of Sara* is meant to connect players to the environment in which they find themselves and provide them with a frame that directs their attention toward details and spatial features of that environment.

Since *Visions of Sara* is a site-specific LBG, it should be created on-site in-situ (Kristiansen, 2009; Reid, 2008). To devise location-based tasks, I needed to get acquainted with Odense. Consequently, I have walked Odense several times to understand the qualities of the town, activities happening there, and have spotted elements and objects in order to base the game on this location. Place is constantly shaped and re-shaped through use (de Certeau, 1988; Massey, 1993), and the traces of this can be experienced when paying attention to them. Hence, experiences and histories, languages and thoughts are gathered in a place (Davies, 2007; Merleau-Ponty, 2002). To uncover which elements locations in Odense have been "gathered," I did three walks, one alone and two with practitioners in order to uncover the

potential of downtown Odense and to see the location from different perspectives, because places are not possessed of a single identity.

This first walk was unguided by any map and an effort was made to leave the well-trodden shopping streets. The biggest restraint was staying within a fair distance of the library, so that the route would not be too long for players to cover. This resembles the method of breaking the habitual ways of moving in an environment by using arbitrary guidance. This concept, *dérive*, was developed by the Situationists, a research group led by Guy Debord, and it has been used by Kristiansen (2009) as an inspiration for developing a mission-style card game that can guide design of site-specific games. An example of *derive*, e.g., is to use a map of London when navigating Berlin (Kristiansen, 2009), or the coded movement «.walk», which is movement in urban space guided by instructions corresponding to an algorithm (Zentrum für Kunst und Medientechnologie Karlsruhe). On this walk Lamm's framework of metaphorical, structural, experiential, and (the added) social aspects worked as a perspective to find locations in Odense. The scenery was explored to find experiential aspects that could evoke bodily experiences, such as alleyways and secluded areas. Photos were taken of details that seemed interesting – even some that seemed insignificant – around which tasks could be developed. This first walk, together with a cursory browse-through of the history of Odense, helped determine the theme for the story and mood of the game, which is elaborated below.

The second and third walks were guided by two dissimilar perspectives to not do three similar walks but rather different ones. Instead of random guidance, in order to learn from practitioners, these two walks were guided by two people. In this way, the walks were research events to analyze how to see game affordances as sensorial and historical aspects of Odense. This is inspired by the ethnographer Pink (2008) who walks through a town with research participants, i.e., different local people in order to understand a phenomenon. The phenomenon in our case is the relation between LBG and location. The second walk addressed this creating of tasks based on locations. *DJEEO*'s creative director gave tips and insights into the approach he usually employs in designing games for *DJEEO Education*. This walk was focused on getting ideas for interesting challenges for the game. The third walk addressed Odense as a location again. On this walk, a local novelist, who is especially interested in local history and writes "historic crime stories," "unlocked" some of the historical aspects in different places in Odense and pinpointed particular places in Odense in which these scenes had played out. This helped in my understanding and appreciating

buildings and details not noticed during the first two walks. In this way, *Visions of Sara* is a combination of fiction and authenticity.

Urban myths are also a combination of fiction and authenticity. The fiction of *Visions of Sara* is related to such a myth in Odense. It is a ghost story about forbidden love between a monk and a nun, which has been recounted by several sources in history. An article in the local newspaper *Fyens Stiftstidende* also describes this myth, writing that a secret passageway did indeed run between Skt. Knud (Saint Kanute) Monastery and the convent Nonneborg (Nun's Castle) (Thomsen & Wøllekær, 2007). Nuns and monks met in this passageway at night, according to legend. It remained that in the 19th century AD, people were talking about poor nuns and monks who walked as spirits, as they could find no rest until they had atoned for their sins against the Lord. This then is the theme that players of *Visions of Sara* are exploring.

Figure 39: Statue of the reunited couple: Antoinette and Jens.

Sara is the one calling out for help and for action. She is a young girl in present time haunted by Antoinette, who lived in medieval times. Antoinette is a nun done wrong. The name Antoinette was found on a statue in Odense that depicts a couple who were reunited in death (see Figure 39). As the game starts, Sara is a mere shadow of her former self. She is haunted by voices, foul visions, and unnerving events. She is experiencing strange things, such as when she received a message on a wall in her home written with the blood of her cat. Her disturbing condition has evolved over some time, and now Sara has had enough. *Visions of Sara* begins with a letter from Sara pleading to a priest for help. This priest contacts the "H.U.B. team" for assistance. H.U.B. is a Danish acronym for *Specialenhed for håndtering af: Hjemsøgning, Uddrivelse og Besættelse* or "Special Unit for Handling Visions, Exorcism, and Possession." The players of *Visions of Sara* are all H.U.B. agents and their task is to find out who is haunting Sara, and why? Players are placed in the present day as a "ghost busters" team equipped with modern gear (PC and GPS units) that will not seem "out of place" but rather will enhance the story and can even be used as stage props (Waern et al., 2009); e.g., running around with a phone with headsets can enhance the experience of being agents "in the field." We will return to a player's response to this aspect in Section 6.3.

The flags shown to base agents that indicate the next goal for the team are the spots in town where Sara sees and hears strange things. This explains the presence of the flags to the players by framing them through the game narrative: these are the visions of Sara. Thus it is indicated why the flag is there, why it is important to find it, and to link tasks. The story is told through the game's tasks. Route tasks are available to the players while they move between flags, but they are not always related to the location, as the designer cannot always know exactly where players are solving these. Route tasks keep intensity high between flags, so that players will not feel that half of the game is about transport, or that players are just cursors moving the GPS (Kristiansen, 2009), which can be the case in *Land of Possibilities?* Players receive the route tasks in the same order between flags, whereas each group receives the location tasks in a different order depending on how the sequence of flags is planned by the game designer. These storylines are laid out as routes that allow the players to pass atmospheric places meant to increase spatial and sensuous involvement. The routes are also planned, so that the physical properties – the experiential aspects (Lamm, 2002) – of the environment, such as its scale and dimensions, also can enhance the sensuous involvement. Players interact with and "adjust" their bodies to their surroundings (Merleau-Ponty, 2002). Players enter a narrow alleyway, walk through a secluded garden, and pass old monasteries. The aim is to challenge players, fuel their senses, and let them engage in both story and the sensuous aspect of places.

In *Visions of Sara*, the social relation is strongest within the groups during the game. The players within the group are not in the same physical space, but they are connected via mobile phones and in game space by their actions. Consequently, players gain access to the experiential aspects of space, although at different levels. The field agent does not have access to the structuring aspect of the environment that he moves through, whereas the base agent has access to reading this space from above via the map but only limited access to the experiential aspect (except from the environmental sounds). The base agent can follow the field agent on a Google map, which by is default offers a "hybrid view" (photo view from satellite, street names are shown, see Figure 40). In this view, base agents can see photos from above of the location that can help when guiding field agents, as they can refer to details such as trees and statues. However, since these photos are not updating all the time and are thus locked in time, players cannot be sure that that particular statue or tree is still in the physical space. This hybrid view delivers ambiguous information to the base agent

(Gaver et al., 2003) that increases the players' need for negotiating the actual context of field agents, which is then constructed as they communicate (Flintham et al., 2003) and by listing to background sounds. This design makes it possible to study how players negotiate contexts and make sense of ambiguous information.
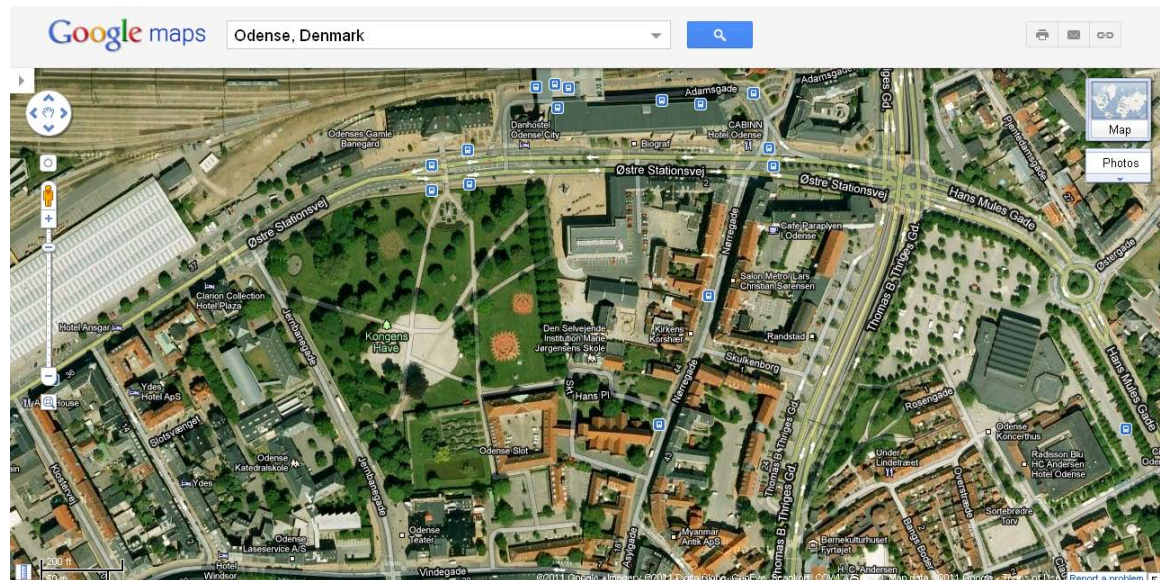
Figure 40: Odense city centre in hybrid view (Google Maps).

From their different positions, the two types of players also experience a different game-play, i.e., they have different possibilities responding to the different aspects of space to which they have access; they can use them to get closer to solving the puzzles, winning the game, and hopefully to get into the mood they desire. In this way, the players on each team both have a role in the game and the possibility of affecting its outcome, which is expected to increase their (tactical) involvement in the game (Calleja, 2007), as their choices and individual performances affect the collective outcome.

In the control center, players from different groups are physically in the same room. They can hear each other, and if they are lucky, they might catch hints or correct answers from the other groups, when each person is having discussions with the partner in the field. Players of *Land of Possibilities?* spend some energy discussing the state of the game and seem to lack knowing whether they are progressing while playing. Therefore, in *Visions of Sara*, the base agents also have access to a high score, which displays the current state of the game and the relationship between the teams. Hence, the sense of progression toward the goal and the position of the team in the competition is strongest at the control center. Base agents also know the deadline and must communicate this to base agents.

Having chosen to keep the platform's possibility of awarding points and having a time frame in the game, while telling a story, *Visions of Sara* is not built entirely in support of narrative involvement, but attempts to balance between an emphasis on the explorative play-mode and the tactical competitive game-mode (Walther, 2007c). This allows for observing both and for players to choose the strategy they prefer. However, as we shall see this frame can also pull away players' attention from exploration, which is not our intent. Since the constitutive rules enhance progressing by gaining points above the process of experiencing a story, it has been a challenge to combine these qualities. Consequently, changes have been made to explore this during the developmental phases.

5.2.4.2 Phase 2: Changes made after the initial tests

The initial version of *Visions of Sara* took place with two persons playing in two game sessions. Phase 2 relates to the key learning derived from these tests.

In *Visions of Sara*, there are two players on each team. The base agent uses a map to structure the path of the field agent who is outside. The base agent knows both where the field agent needs to go and the game-state. Knowing the goal and the progression toward it are two central pieces of information in relation to player motivation (Apter, 1989). Base agents also have access to the key plot, as they enter all the answers, and answers are part of the plot. Through the tests, it became apparent that the field agents had a hard time relating the things they found in their surroundings to the story, as they had already moved on when the solution was found. To engage the field agent further, the game must encourage the base agent to share information on both goal and progress to keep the field agent motivated and keyed in on the story.

During the second phase, the wording of many tasks was changed to encourage players to this share information on progress but also information related to the story and to make tactical choices together. Even more important, tasks were changed, so that the field agents' role as "clue finders" and the base agents' role as "story intermediaries" became even more interdependent, and the story was tied closer to what was found. For instance, instead of just finding "the name on a statue," field agents were directed to find "Antoinette's lover," and by following instructions of the base agent, they found the name at the statue. This often made task information more ambiguous but also more engaging to players.

Tasks were included in the second half that raised the knowledge of the base agent in the first half, so that the player could combine the roles in the second half. This was done to make it easier for players to follow the story and to enhance its significance for game-play. Finally, tasks that would summarize the story were designed, and the correct answer to questions made available after each location task.

In the first test, one of the players emphasized that she enjoyed finding details such as Justitia, and a task in which she had to find a dung beetle on a bench. For her, the "cool thing" is to discover something she has not ever seen. She said that it was "fun to hunt in the city for answers." [VoS, test, P1, 1] [20] She experienced the agent role as amplified when she had to find something only she could find to solve the tasks. Thus, these types of tasks in which something had to be found in the environment were increased. However, to provoke players, a task where nothing could be found at the location was also made.

5.2.4.3   Phase 3: Changes made after the Premiere

In this phase, it became apparent how competition and interplay between groups changes players' behavior, as opposed to the first two tests with one person.

Visions of Sara consists of four routes, each a little longer than four kilometers (two kilometers for each half). Each of the two halves in the game is timed, so that players meet at the control center at the same time and to increase the element of competition. This also means that it is not certain that the groups will have time to deal with all the tasks. There are limits to how far players can walk or run in a game, and this limit depends on the physical condition of each player. *DJEEO* recommends that the distance of the route be around two kilometers in each half. In addition, the tasks need to be close enough to each other, so that the game maintains a certain level of intensity. The fact that the control center is at the library in Odense limits the area in which locations can be spotted for the game.

In the second phase, it appeared that teams were focusing much more on the time restraint than did the test players in the first phase, which meant that they covered less location tasks. In the first versions of *Visions of Sara*, each half was 45 minutes long. However, through the premiere, it became apparent that this was too little time to play, as some players were

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[20] Please see the appendix, p. 287 for the Danish transcription of these statements.

frustrated when they did not make it to all the flags, and thus missed much of the story. These players were annoyed that they had to rush through the game missing the story and preferred to linger over the details, which they rather liked. However, not all players agreed that the time restraint was disturbing. This group claimed that it increased their excitement – the level of arousal – and they liked this increased intensity. The option of removing the time restraint was discussed among the two groups of players. The group that wanted to engage more with the story and the challenges given wanted this, but the other group felt this would ruin the game's level of excitement. Accordingly, the time restraint could have been removed entirely to make the game more about narrative involvement and exploration, but instead, the duration was extended so that each half lasted 60 minutes to continue accommodating the option of game-mode. This length is more appropriate, as most players can make it to all the flags, although they still will have to keep a certain pace. In order to ensure a player did not miss out on essential story information, the sequence of tasks was changed, so that the less important information was found at the end of each half. With these changes, players could still choose the strategy they preferred.

In this third phase of development, it was observed how players discussed the time they spend solving puzzles in relation to how many points they would be awarded during the game. Having points in the game enhances the ludic aspect, as points relate to the game-mode of players, making them focus on progress and outcome (Walther, 2007b, 2007c). Possibilities were accessed by players in relation to the risk trying to solve them and to the reward in terms of points. As the emphasis in the game is on exploring space, which should be the main reward, the balancing was changed, so that solving tasks that require exploration award the most points, while fewer points are given for finding flags, and the penalty for exceeding the deadline is low as well. This does not mean that the players are not encouraged to find all the flags, because if they do not find them, they do not get the location tasks, and consequently they do not experience the whole story and do not have a chance of scoring as many points as the other teams. The points give the player immediate feedback, which informs the player of the underlying premise within the game's frame (Bateson, 2000) and thus how to reach the game's goal (Apter, 1991). This guides the players' actions and attention toward exploration as a pattern. However, an appropriate option that remains unexplored is to remove points and time restraints entirely. This would increase the emphasis on exploration and following the story even further and decrease the element of competition.

Testing this to see how game-play and player experience would change remains an interesting possibility for future research.

In *Visions of Sara*, base agents mediate between game-state, information given, and the field agents; and the field agents change the meaning of the elements they explore and translate it to the base agents. Thus, *Visions of Sara* lets the base agent interface between the game system and the field agent, whereas the field agent interfaces between the locations he/she explores and the game. In this way, the two players each have access to and perform a part of the interface. The base agent can enter text and choose one or more options by clicking the preferred option(s). This interface revolves around asking questions and entering the answers, as well as guiding the field agent and thereby indirectly moving the GPS and reading its position on the screen. After observing how players would sometimes just chose one of multiple possibilities instead of searching for the correct answer, tasks were changed, so that there were fewer questions that players answered by choosing an option and more that required them to write a sentence. Further, more clues enabling players to find the answers themselves were added, and some of the tasks were changed, so that one of the agents could not answer the puzzles without a partner. These changes, together with decreasing the time pressure and altering points awarded were all made to allow players to focus more on solving tasks every time.

In this chapter, the phases of development, inquiry, and the background for design of *Visions of Sara*[21] have been presented and linked to an analysis of two different LBGs and their elements. This design inquires about the relationship between LBG, location, and player experience. In the following two chapters, the players' responses to the game as well as experiences with other games are analyzed and related to theory. These chapters will focus on, respectively, the strategical and tactical practices, i.e., LBG structures and player experiences.

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[21] A presentation of the LBG *Visions of Sara* taks-by-task related to theory is found in the drop-box related to this dissertation. Please see instructions on how to find this on the attached CD.

6 Location-based Games, Boundaries and Spatiality

In Chapter 3, LBGs were defined as being situated on the boundary between play and ordinary, authenticity and fiction, digital and physical media. What does this definition mean when analyzing and designing LBGs? In this chapter, these three boundaries are related to the LBGs played and observed. This is done to develop a framework that can help designers and scholars understand the mechanics unique to LBGs and to incorporate strategic practices that enable play. In this chapter, focus is on organizing LBGs in relation to letting players experience their locations and their surroundings, not on the way they are experienced, although experiences are used in the analysis to shed light on the topic.

The chapter presents an analytical distinction between ordinary and play; fiction and authenticity; digital and physical media in relation to design. The argument is that this distinction is useful when designing LBGs; however, when *experiencing* LBGs, we cannot maintain the distinction between these dimensions, which is one of the features of LBGs. Viewed from an experiential perspective, the boundaries comprise a "gray areas," as one's perception of them depends on the situation and the player's interpretation. We will come to an analysis of experience in Chapter 7.

The way we act in and perceive space is affected by the media we use (de Souza e Silva & Frith, 2010; de Souza e Silva & Sutko, 2011; Jansson, 2006; Manovich, 2006; Meyrowitz, 1989, 2005). This chapter relates to how LBGs are structured to affect our experience of locations and the surroundings. We will learn how each of the boundaries and dimensions relate to each other and to LBGs. The chapter relates to the second inquiry about conceptualization of LBGs and spatiality (cf. p. 7) in relation to structuring player experiences.
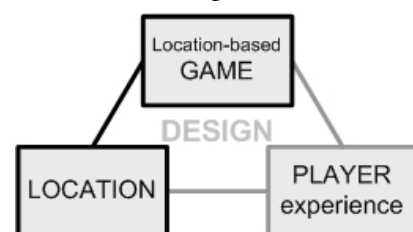
The chapter concludes with an expansion to the model of the Designing Boundaries in LBGs model for use when designing and analyzing LBGs. This expansion encompasses questions to each of the boundaries and the dimensions. Designing Boundaries in LBGs model is the point of departure for this chapter. It will be used to organize a structural analysis of LBG characteristics and the way this affects guiding players' perception of and

interaction with locations. This model was presented in Chapter 3, p. 78, and is repeated here in a reduced version:
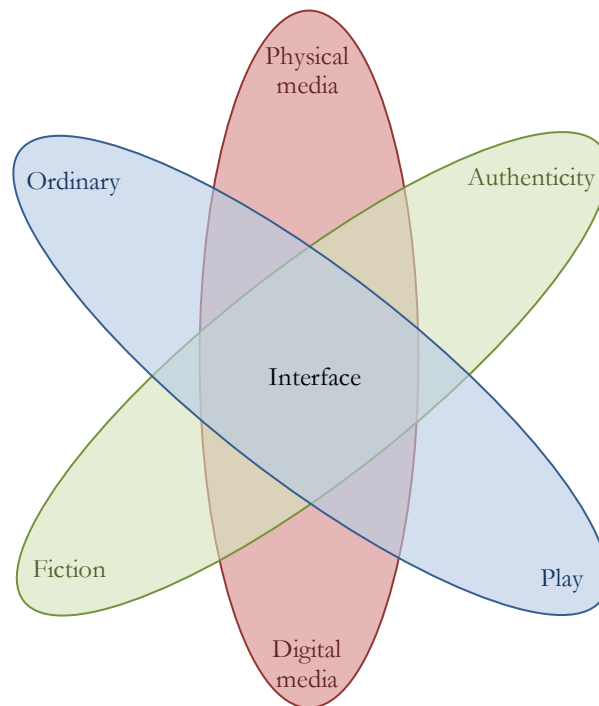
Figure 41: Designing Boundaries in LBGs – model outline.

The three boundaries are analyzed separately in relation to LBGs. First, the dimensions *ordinary* and *play* are explored in relation to the design of LBG limits, to meaningful actions, and motivation. Second, we will look at how the content of LBGs is framed and perceived in relation to the dimensions *authenticity* and *fiction* and the boundary between them. Third, we will examine how LBGs involve and merge *physical* and *digital* media.

When LBGs play with boundaries, it is in relation to meaningfulness, frame, and media, and the interface that connects them. The three boundaries between ordinary and play; authenticity and fiction; physical and digital are related to, respectively:

1. **Meaningful** actions; thus, motivation relates to the permeable boundary between play and ordinary, to the mode of the players, and to their perception. First, play is defined as separate from ordinary (non-play) due to its meaningfulness; then, within the play activity, players shift between two modes, *paideia* and *ludus*, which also are related in this section. This analysis is related to the meaningfulness created through the play activity that distinguishes play from ordinary and the choices players make

within the game. This is a level of framing that relates to the *context* of play, encompassing the setting, the player's moods, and passersby (see Figure 43).

2. The **frame** of the LBG plays with the relation between authenticity and fiction. This analysis relates to structure and significance of LBG *content* (objects, events, actions, and environments that are part of play).

3. The **media** used in LBGs is a mix between physical and digital, which concerns itself with the way an LBG is represented and through which the player can act.
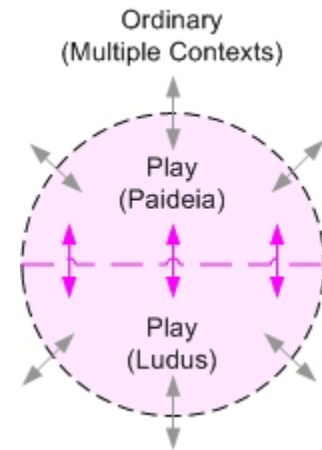
Figure 43: Play is related to ordinary, and the two modes within play are related.

The first boundary explored is the border between play and ordinary, and the boundary dividing play activity between process-orientation (*paideia* or play-mode) and goal-orientation (*ludus* or game-mode).

6.1   Play and the Ordinary: Meaningfulness and Motivation

LBGs bring play to life in the "ordinary" world. The limits of LBGs are not always clear, as the apparent and actual frames are not always identical (Benford et al., 2006). Thus, the relationship between the play and ordinary world is central to LBGs. The boundary between play and ordinary are linked to framing and the concept of the magic circle, which has been discussed in earlier chapters of this dissertation in relation to games and by several other scholars (e.g. Copier, 2005; Dansey, 2008; Harvey, 2006; Juul, 2008; Montola, 2005; Montola et al., 2009; Nieuwdorp, 2005; Salen & Zimmerman, 2004). The magic circle should be understood as a psychological concept, and can be related to both Huizinga's and Bateson's understandings of play as meaningful actions that separate themselves from the ordinary due to this meaningfulness, and Apter's theory on the protective frame that protects players from real harm and causes players to seek a certain level of arousal. The purpose of these concepts is to describe how we *experience* play as distinguished from the ordinary, and in Apter's case, to describe how players seek excitement within safety (cf. Section 3.4). However, the ordinary also affects our actions in play, and LBG play includes elements that normally would be perceived as part of ordinary life. Thus, there is not a separation but a permeable boundary between the two spheres. This section concerns this boundary and the attitude that the LBG encourages in relation to ordinary and play.

Within the play activity we find also a boundary, between two motivational states: between the free and improvisational mode, and a planning, progress-orientated mode. This is a distinction between a process-orientated approach (*paideia* or play-mode), and a goal-oriented approach (*ludus* or game-mode), between which players continually shift during play. The motivational state a player is in relates to which kind of actions will feel pleasurable and thus meaningful. Further, this section is concerned with the player's motivational states and how both the LBG and the environment affect them.

In the following section, the distinction between *ordinary* and *play* is discussed in relation to LBGs played and observed. It is shown that the limits between ordinary and play can be either *non*-existent, *implicit*, *explicit* or a mix between implicit and explicit to players in LBGs. In either setting, the player's actions can be *overt* or *discreet* in relation to non-players. Secondly, we see how in LBG players shift between being playful (*process*) and goal oriented (*progress*), and what this means to players' relation to spatial locations. In this section, we will see that players maintain a certain mindset when playing that shifts between the process of *playing* a game (paratelic) or being focused on goal planning and negotiating boundaries or *seriously* trying to win the game (telic). External events and conditions can affect this mindset. Finally, a conclusion of the experienced difference between play and ordinary, process-orientation and goal-orientation is presented.

6.1.1 Play and Ordinary

In Chapter 3, play was discussed and defined. In this chapter, the main points of this are briefly reiterated. In relation to play, Huizinga, Montola et al., Bateson, and Apter all describe how players situate themselves in relation to the ordinary world when playing. Huizinga (1993) stresses that in a game, the rules separate the game from the ordinary, as they limit the event in time, space, and social setting. Play stands out from "life," from the ordinary and from everyday, as it has a special social meaning for those in the know (Montola et al., 2009). Play is:

- Experienced as separate from ordinary due to its meaningfulness (Bateson, 2000; Huizinga, 1993)
- Interpreted according to the premise of the game, which means that actions do not refer to or denote what they would normally would (Bateson, 2000)

- Experienced as limited in time, space, and social setting (Huizinga, 1993)

- An attitude toward the world, and players aim for excitement (Apter, 1991)

- A situation in which players remain within a protective frame: They feel protected, trusting that they will not get (seriously) hurt and that their actions do not have consequences (Apter, 1991)

- A situation in which players connect play and ordinary world through play (Copier, 2005)

When we engage in a play activity, we are not *in play* all the time. Players of any kind of game experience how they jump in and out of play, as they are performing at one moment, and the next they are out of play discussing the rules or paying attention to social norms (Juul, 2008). In LBGs, these shifts between being *in play* and *out of play* are complex, because they are set in ordinary space, and as the limits of the games are fuzzy and it is part of game-play itself. Consequently, players need to negotiate the boundaries between ordinary and play regularly in LBGs. The boundary between play and ordinary described with reference to a magic circle

(Salen & Zimmerman, 2004) has been questioned in relation to games set in the ordinary world by scholars. Montola defines pervasive games as games that expand the magic circle either temporally, spatially, or socially (Montola, 2005). Players do not know when the game is scheduled, where the spatial limits are defined, or who is playing the pervasive game. In Chapter 3, I argued that the limits of LBGs are blurred as well. Players do not know what the gaming affordances of the ordinary world are (McGonigal, 2006, 2007a) before playing the game. They experience them by playing the LBG.

Moving around in the physical space of *Visions of Sara, Spy in the City,* and *Land of Possibilities?*, players do not know which of the elements in their environment are parts of the game, as the boundaries of the game are not

Figure 44: Overlaid information reveals a message after players have decoded it in *Spy in the City.*

explicitly drawn. In *Fruit Farmer* and *Ghost Patrol,* the game-spaces are limited in design, but players must explore them through their movements. Design-wise, these games often do have spatial limits, such as geo-zones in which action takes place. However, the players are

unaware which parts of space are and are not actually related to the game. In accordance with this, while playing *Spy in the City*, players are guided to seek directions to the next task by decoding a text chiseled into the building wall of the *Newseum* (Newseum, 2008). This overlaid information (see Figure 44) was not intended to be part of a game when the stonemason rendered it; thus, players have no chance of knowing that it is part of the game. The text is in fact the first amendment to the Constitution of the United States reminding people about the freedom of speech and press. However, in playing *Spy in the City*, this text is given new meaning, as players need to find certain letters to form a word in the text. It is a part of play, although it has meaning in the "ordinary world" as well. The text offers gaming affordances for the players of *Spy in the City*. Through tasks such as this, players learn that there is no harsh division between play and ordinary, the boundary is permeable, and virtually anything can be part of the game.

In *Spy in the City*, the designers are the mediators who found the text and point it out to players. In *Foursquare*, players create the game space through their activity. No explicit limits exist in this game's design, for players define the game space continuously. Moreover, because players can create venues anywhere, there are no experienced limits between play space and ordinary space. This means that besides finding expected venues, e.g., as cafés, squares, etc. venues such as "In my beloved bed," the "Chuck Norris - Safehouse" emerges, and who would not enjoy checking in at the "Bottom of the laundry basket," which apparently is a venue in Aalborg, Denmark. By devising these creative locations, the LBG allow player to find gaming affordances in the ordinary and relate them to play, and in doing so, crossing the boundary.

Figure 45: Checked in at 'Chuck Norris - Safehouse'
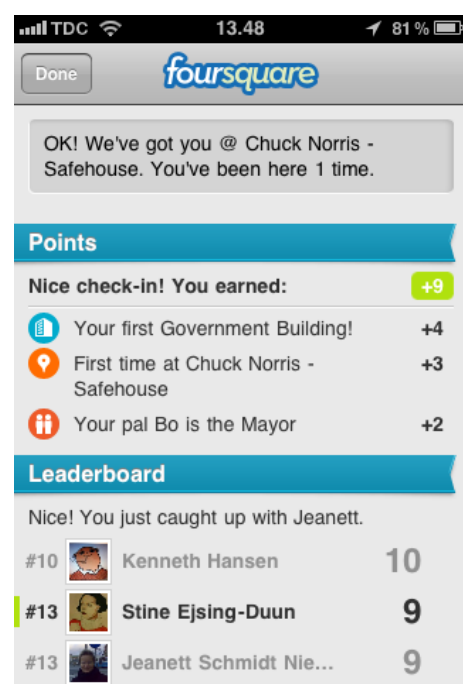
In two of the LBGs mentioned, *Foursquare* and *Ghost Patrol*, we find no limits in time – they are always on. In these games, players can jump in and out of play as they please. *Foursquare* can even contact players via a message on their phone when they are not playing, provided that this has been permitted and enabled. Players are still at liberty of choosing whether they

want to accept the invitation or if they prefer to decline. In this way, *Foursquare* users are invited to interact when they are potentially in a serious mindset. Thus, LBG play can be designed to purposely pervade the sphere of the ordinary.

In an LBG set in an ordinary context and in which performers assume roles, e.g., as in *URAAY,* players do not know who is in the game (socially). Through the observations, it appeared that even when playing LBGs, which are not designed to expand socially, players can still experience uncertainty over who is intended to be a part of the game. In *Spy in the City*, players receive a photo of a terrorist and are told to keep watch for him. The LBG points toward something that is not actually there; however, since it is possible, when I played, my teammates and I continuously searched the streets for the man during the game, not knowing if this was an LBG that involved actors. To players such references are ambiguous since they do not know what they can expect playing in the ordinary world. This is illustrated by a situation in which a girl playing *Land of Possibilities?* thought that NPCs could be a living people and thus looked for them. The other girls corrected her, as they anticipated that no actors were in the game. Regardless of the design, players occasionally consider involving people that they know are not part of the game, which is a particular possibility for games played in everyday space. When considering this, players still relate to the frame of the game. Hence, playing *Visions of Sara*, the player named Tora considered asking passersby if they could help her, although she was not sure whether the game would "allow" her to do that. In none of the observations did players actually cross the boundary and include passersby. An opportunity that arises blurring the frame even further or directly instructing players to include non-players as is done in *URAAY* and *Spy in the City* can increase the aspect of social expansion and cause a corresponding higher level of excitement related to this behavior. In all three observations, players are *ready* to become involved with strangers and non-players are involved to some degree, as players consider them as part of the game. In this way, players' attitudes toward their surroundings are playful, and they are free to expand the LBG's boundaries into the sphere of the ordinary.

However, inviting people to join in and to do things that are not "normal" in public space can be a challenge. Montola et al. (2009) suggest that the game should not only be fun but also look as if it were. When people look like they are having fun, it can induce a playful mode in passersby. Similarly, it should be easy in which to participate (Montola et al., 2009). The last part is the most difficult to achieve with LBGs. *Land of Possibilities?*, *Fruit Farmer*,

Ghost Patrol, *Spy in the City*, *Visions of Sara*, and *Foursquare* all require special equipment and a special program running on it, making it difficult to enter the game. Also *Land of Possibilities?*, *Spy in the City*, and *Visions of Sara* are played in groups and in sessions that do not repeat themselves, making it tricky to join in. *Foursquare* is the easiest game to enter, as it is fairly well-known, runs all the time, and players can enter at any point. In addition, *Foursquare* makes it possible to meet up with other players. However, some types of LBGs are difficult to enter, such as those analyzed. When we discuss a social expansion in relation to LBGs, it is primarily related to how players involve bystanders in their game or how the LBG points toward passersby rather than the game expanding socially to include more players.

When Huizinga (1993) defines play, he states that it carries its meaning and sequence in itself. The actions performed as play do not refer to anything outside of the activity itself. LBGs challenge this idea. Although the actions in LBGs *do* carry their meaning and sequence in themselves, they do not always refer *only* to the context of the game. Playing *Foursquare*, players are not just earning points but also telling a story of their being in the world, the places they actually visit, and how often. This means that through the updates on *Foursquare*, I can tell that my former colleague is following his child to school every day; or that an old classmate living abroad is in town and happens to be at a café nearby. These actions refer to something outside of the game; it is not only about checking in to earn points. The actions tell a story about the everyday life of my former colleague and give me the opportunity to run into my former classmate. Another way that the boundary between ordinary and play is blurred is when players perform indexical actions that can be understood as being non-play by passersby. Playing *Spy in the City*, players "scan" the surface of a mailbox to find a hidden message. Bystanders cannot tell that the player is playing and thus the actions of scanning the surface of a mailbox might count as something else for them. This in itself does not conflict with Huizinga's definition, but if they respond to the player in a way that shows this interpretation, the action refers to something outside of play to the player as well.

Actions in LBGs can refer to something outside of the activity. They produce meaning in multiple frames concurrently (Mäyrä & Lankoski, 2009). Therefore, players of LBGs can actually pursue three goals that might overlap and hopefully do not conflict: the goal of the LBG itself, their preferred level of arousal, and the effect or meaning in relation to ordinary life. Checking in at a venue in *Foursquare* serves as an instance of this: The motivation to perform check-ins can be to take a mayorship from a friend and to experience the

excitement in relation to this; or to relate that I am at work right now, while being at work has a purpose in itself. One *Foursquare* contact frequently checks in at the "Bottom of the laundry basket." In this way, a chore – doing the laundry – can become part of a competition with others (e.g., her husband) holding the "mayorship" of that particular venue. Again, players find the affordances in their everyday life. Not all LBGs allow weaving play into everyday life to this extent, but it is a possibility specific to LBGs.

LBGs are set *in* the sphere of the ordinary, and while in play, players can use these surroundings either as a scene for performance or as a means to draw the ordinary into play. Consequently, some of the characteristics of play as *separate* from ordinary life disappear, and the game is integrated into the everyday world of the player. LBGs can allow players to weave play into the everyday, and vice versa. LBGs can blur those parts of the game that are actions and objects; the location of the game; when the game is on or being played; or who is and is not part of the game.

The temporal, spatial, and social limits of the LBG can be **non-existent** in terms of design, e.g., when players can play on infinitely, as in *Ghost Patrol,* or when the player must create game space, such as in *Foursquare.* However, this does not mean that players are actually playing the game forever, everywhere, and with everybody. Players set limits to play themselves, shifting between modes of motivation – going in and out of play. Further, there are always some limits - all of the limits cannot be non-existent. However, when some of the limits are non-existent in LBGs, players have the opportunity to weave LBG play into their everyday life, accepting invitations to play, or volunteering to let the game or its players contact them "outside of play."

The limits can also be designed as **explicit** – limits are known to the player. In the LBGs with a time restraint, this limit is communicated from the beginning. However, no examples of this have been observed with the 16 LBGs presented in this dissertation in which *all* limits are known, since play space in physical space is not explicit to players in any of the LBGs.

Boundaries between play and ordinary can also be designed as **implicit** – they are there, but the player knows not where. This is the case in *Visions of Sara* in which geo-zones and objects are defined through the design but are not apparent to players. Field agents need to uncover these boundaries by moving around with their devices. There are also cases of limits that are

simply not stated through the LBG, and thus the player does not know, e.g., who is in the game. This is why the girl playing *Land of Possibilities?* started to look for people in the surroundings who might be playing a role in the game, as it was not communicated explicitly. Implicit limits thus call for exploration and ambiguity.

Finally, designers can purposefully design an **apparent** *(explicit) set of limits that differs from the* **actual** *(implicit) limits*, as suggested by Benford et al. (2006). When playing an LBG in which the apparent and actual limits are not identical, players may think they are playing in a contained play space, but will be surprised as it expands, or they are playing in a limited play space, but expand it themselves as they believe it to be bigger. *Spy in the City* is the only one of the LBGs analyzed here that purposefully uses this strategy. This game lets players perform feigned interaction, as the game instructs them to scan a sign for a message with their device. However, when seeing the type of technology the device contains after the game is over, it becomes obvious that it could not scan the surface (it does not contain an RFID reader or similar), and that the game feigned to have a larger game space than the actual game space. The LBG can also consciously make use of ambiguous contexts, relations, or information as pointed out by Gaver et al. (2003). This technique is used in *Spy in the City* in which players are presented with information from a mole and reminded that this spy is a double agent and thus the information may not be trustworthy. Through this design, arousal is increased, as players need to take chances, and they do not know when they are acting within the limits of play and when they are not.

One aspect to consider is the limits in relation to space, time, and social setting are designed and conveyed; another is how players are instructed to act, and how these actions communicate play. Some LBGs are very **overt** in making a big deal out of communicating to non-players that play is pervading the everyday world. Playing *DJEEO Education* players are often asked to wear yellow vests with the *DJEEO* logo printed on to it for safety and marketing reasons. These vests do not communicate play but show that an activity is going on. Players can also overtly act in a way that shows that in

Figure 46: Players of *DJEEO Education* wear visible vests that overtly communicate that an activity is going on (Photo: *DJEEO* – joshuatree.dk).

this spot, play is unfolding. For instance, when players of *Fruit Farmer* are running around

looking at their screen, squealing and laughing, bystanders should be able to guess that they are involved in play. The designer can use these tactics to put on a display that a game is going on. Players are acting out the game, implicitly saying, "Here I am, and I am playing." There are more extreme cases of using this strategy. Thus, having players dress up in Pacman costumes or use physical props, such as large flags, are examples of an unambiguous approach (seen in the New York City game *PacManhattan* (McGonigal, 2006) created by graduate students at the Tisch School of the Arts, New York University (Tisch School of the Arts, 2004)). In these games, the goal is to send a signal to an audience. In this way, play becomes a performative act not only in terms of the players performing, but also because they are performing for bystanders as an audience. They disrupt the normative conventions of public space through their play (McGonigal, 2006). This is a way of discussing the legitimacy of a space (Brewer & Dourish, 2008) through the LBG, a comment on the ownership and purpose of that particular space that is directed not only toward the player but also the passersby, too. These performative, overt LBGs **superimpose play** on the ordinary world.

Whereas some LBGs are overt, others are designed to be **discreet,** allowing players to weave play into an ordinary context without showing it. *Foursquare* is an example of how players can be discrete about playing, but only to a certain extent: Every time a player checks in somewhere, he/she shares that information with others who are part of the game. For the uninitiated, however, it is not visible that others are playing a game. *Visions of Sara* can be played in a discreet fashion, which is preferred by some players, e.g., Vitus, while others, e.g., Tora, consider bringing passerby into play. Being discreet toward bystanders can even be part of the game-play, as it is in the pervasive game *Killer* in which players are instructed to perform their "kills" without being noticed (Montola et al., 2009). LBGs that are discreet are **embedded in** the ordinary. These two approaches relates to how players' meet everyday space. Players are allowed to be overt or discreet which are the extremes of a continua and LBGs can be found anywhere along this measure.

The boundary between play and ordinary is not necessarily made material, as in the lines on a soccer field or rules in a game, although it is sometimes externalized through the design. In other words, boundaries can be either explicit or implicit. However, there will always be a premise that defines what is and is not inside the frame of play, and our attention is guided toward the contents of it (Bateson, 2000). Players can trust that there is some intention

behind the design, that there is a premise of how to interpret actions and objects. This premise has to be appropriated through play. Through two tasks *Visions of Sara* inquires about the players' relation to the premise of the game: one whereby base agents who until that point have been sitting still in front of their PCs need to find a book at the library, and a location task whereby there is nothing to find at the location for the field agents. These tasks both disrupt the way tasks have generally been divided (the base agent being stationed at the PC, and field agents taking on the role of clue finders at locations) and thus challenge the premise and dynamics of the game. In both cases, players will try to stick to what they have learned to expect and take joy in the game, even though the instruction are clear: in the first case the task description was changed so that players knew they had to find a book, and in the second task it is clearly written that there is *nothing* to find at the square (we return to the players' response in Chapter 7). There is a contract between players and LBG of what is meaningful, and it is partly broken or must be renegotiated in these two cases. Thus, limits between play and ordinary is experienced through play and negotiated between players in these situations. The girl who is looking for people as NPCs and players in *Visions of Sara* who keep searching for clues where they have been told none exist are exploring what is and is not meaningful in this game by searching for gameness in their surroundings. Players trust that the game will guide them toward meaningful actions and as the organist (cf., p. 106) they incorporate the LBGs premise and acts through it. If they succeed this meaningfulness will make play stand out from the ordinary.

As demonstrated, LBGs play with the boundaries between play and ordinary in the way they are designed. There is a difference between play and ordinary, even in LBGs. The limits separating play and ordinary can be described on two levels:

- As the limits set through the *design* of the game. These limits can be designed as non-existent, explicit, implicit, or a mix between explicit and implicit; and overt or discrete toward non-players as shown above

- As the player's *experience* and creation of a boundary between play and ordinary due to the meaningfulness experienced in play

We cannot disregard the idea of a magic circle or framing in relation to LBGs, as there is a relationship between being in play and out of play. However, to appreciate the idea of a boundary between play and the ordinary world, we should distinguish between the intention of design and the actual experience, and describe how the boundaries are planned in design

and how they are negotiated in play. This difference is apparent in *Land of Possibilities?*: Although designers might not have considered that players would find it ambiguous whether passersby or actors are part of the game, players can experience the social boundary as expanded. The magic circle (as well as Bateson's "frame") is a social construction between players and game system, it is a ritualistic contract within which special social meaning is created (Montola et al., 2009). This is found between players, and between players and the producer of the game. The contract is not absolute, but in constant negotiation, through which players relate to each other, to the intention of the game, and to their own preferences. We return to intention in Chapter 7 when analyzing LBGs in relation to player experience.

LBGs differ from video games in that they are played in the context of the ordinary world where players meet others with their own agendas and intentions and where affordances potentially are infinite. This condition in itself, regardless of the design, makes for ambiguous play in LBGs. This is no different from other types of (paidiac) play that take place between people, where the boundaries are also negotiated (Bateson, 2000; Huizinga, 1993; Juul, 2008). However, in LBGs, designers can increase the level of ambiguity that will cause greater excitement and creation of meaning, and players do not know what to expect since some of the boundaries are designed.

When players of LBGs negotiate boundaries of play, they look for the intentions of the designer(s), adjust to the actions of other players, the context, and relate to their own motivation. Within play, players shift between focusing on the process and progress of play. Their meta-motivational states and thus mindset toward their surroundings shift (Apter, 1989, 1991). This process is discussed in the next section.

6.1.2 Play: Process and Progress

Meaningful actions are performed and relevant within the frame of the game, relate to the context of the game situation, and help pursuit of a pleasurable state of arousal (cf., p.104).Within the frame of the LBG, players' actions refer to the goal of the game and to the level of arousal toward which the player is aiming. Players are pursuing the goal of the game and they are in process-oriented mindset. If the focus shifts, and the goal of the game becomes more important than the process, then the player shifts to a telic state of mind, e.g., planning actions and assessing their impact. The player is *working* hard to reach the goal

(Apter, 1991). Players shift between these two modes: Play-mode (paratelic) and game-mode (telic) (cf. Section 3.4.1). Players are also shifting between playing and meta-communicating about play (Bateson, 2000), focusing on the organization of play, as they discuss, e.g., their roles, and the rules.

These constant shifts are can be conditioned by a change in the sense of goal, means, and excitement. Internal conditions such as saturation and frustration can cause shifts too (Apter, 1991). Even more interesting in relation to LBGs, however, is that conditions in the players' surroundings can cause these shifts as well. In LBGs, the external conditions that affect the motivation of players encompass the game itself, circumstances in the environment, and communication. Let us have a look at how these factors affect the player's mode.

The mindset of players toward the locations and the activities in which they engage is affected by the design of the LBG. LBG players shift between being process oriented, explorative toward and mapping the space they are in, and being in a goal-oriented mode of moving and advancing in space (Walther, 2007c). We see this in *Visions of Sara* when a player searches the environment to find clues in one moment, and the next he rushes toward the next flag inquiring about the score. These two modes are both supported in the game design, but some of the players observed prefer remaining in the play-mode – searching for clues and lingering over details – whereas others feel more motivated by moving forward. These two preferences are reflected in the discussion of having limited time and being awarding points for finding flags, and losing points when exceeding the deadline, a position that players in game-mode favor, whereas players in play-mode prefer to have no restraints

Figure 47: A field agent in *Visions of Sara* is rushing between flags talking with the base agent (Copyright Kennett Krebs)

prevent them from focusing on exploration. If players' mindset was conditioned only by their preferences for play, they would perform only the actions that led to a state of raised arousal, but they do not. They are motivated by progress, too. They are affected by the rules

and goals established in the LBG. The preference for play-mode and game-mode in an LBG, which is highly physical, is also related to the sense of means available: Players do not have the same means in terms of running, some are in a great condition, others not so much. If the tactical choices do not allow an alternative to rushing, this difference can cause frustration, as it did for a group of players in *Visions of Sara* (this is discussed further in Section 7.2). The mindset of the players is affected by the goals, players' sense of mood, and the possibilities made available in the LBG.

Different kinds of contexts are expected to induce a certain mindset. For instance, a theme park is meant to inspire playfulness in visitors, whereas at the dentist, people are normally in a serious mindset focused on, e.g., the bill and the pain. It is the purpose to use the environment's ability to influence players' mood when, in *Visions of Sara*, one of the tasks is finding the entrance to a tunnel in which the nun Antoinette was killed on her way to meeting her lover. This tunnel is found in an out-of-the-way garden to increase the excitement of finding it. Using conditions to affect the player's state of mind happens in a wide range of media. What is special about LBGs is that play happens in places not intended for play. This means that they are often played in ambiguous contexts (Gaver et al., 2003). Players of LBGs experience a lack of clarity related to the game itself, and it is playful to explore this phenomenon. In *Visions of Sara*, play is brought to the library, as players are encouraged to get a book at the library during the game. The library is a place not normally associated with play but with quiet and concentration. Just as the normal frame of surveillance cameras consists of seriousness, surveillance, potential dangers, and law and order, in *CitySneak* they are framed by play, because spotting and avoiding them becomes part of the data space they create as playful. *Fruit Farmer* can be set up in any space, turn it into a playground for the players. In *Spy in the City*, an office building is both that and the hiding place of a fellow spy who sends messages.

Communication can also give rise to a playful mindset. Players of *Foursquare* can provide tips at locations that invite others to be playful, as illustrated by this tip from the venue "IT-Universitetet": "Go to the IT-University of Copenhagen, go inside, and take the elevator to the 5th floor. Make a paper airplane and make it travel down into the atrium as far as possible" (see Figure 48). The player providing this tip is not just performing within the frame of the LBG, he is pointing out the affordance for play in this location to others. Via the force of digital media, he can leave his trace and affect other players' action at and

perception of this specific location, as his message stays after he has left it. He has made a connection to this place and invites others to do so, too. His description suggests people focus on play, and if they accept this invitation, it can put them in a playful mode. Another example: when LBGs superimpose play on the ordinary world, this can inspire others to feel playful, and to eventually join in if it is possible.

Figure 48: Tip at the IT-University

The LBG player's mindset can also be affected by conditions in the player's environment that removes the focus from play. Nova and Girardin (2009) offer an observation of this, describing how players try to avoid dark corners of campus when playing *CatchBob!* Non-designed conditions also affect players' motivation. In *Land of Possibility?*, both a loose chicken and rain turned a player's focus on, respectively, getting away and finding shelter. In addition, incidents that remove the protective frame (Apter, 1991), such as traffic, can also cause a player to shift modes. As the protective frame is somewhat fragile in the everyday world, LBG players cannot focus entirely on play, as they play in surroundings in which they can experience real harm (cf. Section 3.4.3.1).

In conclusion, LBGs provide premises that change the immediate meaning of a context, rendering them ambiguous. This brings about a mindset in which players are ready to read spaces in search of their potential for play in everyday spaces. However, this ordinary world can also affect the mindset of players removing them from play.

LBG players are always shifting between focusing on play and meta-communicating during a game. In particular for LBGs is that they are set in contexts not intended for play, which makes these shifts even more apparent. Some of the conditions that affect the players' motivation are within the designers' control, while some are not, as LBGs are set in a "messy world" (Nova & Girardin, 2009). Further, the motivational states relate to the players mindset toward the world, which is affected by the premise of the LBG, e.g., *Foursquare*'s premise directs players' attention toward conquering, sharing, and exploring locations. This
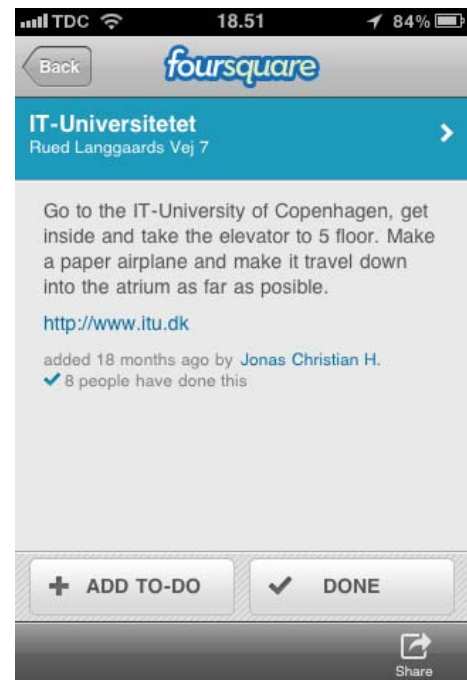
premise allows the *Foursquare* user to maintain a playful mindset toward the atrium of the IT-University. The atrium is not intended for play and is part of the ordinary world, yet the LBG influences the way the player relates to the ordinary world while at play, and perhaps even after the game has ended. In *Visions of Sara*, players search their surroundings for clues. Posters, statues, façades, signs, etc. are all potentially part of the game, and thus players' attitude toward them is transformed. Players must learn where the boundary between ordinary and play is, and they learn it by playing. Thus, the boundary the players experience is often not identical with that intended by LBGs. The mindsets of players also shift between feeling playful and oriented toward the structure and progress of the game. This is affected by the structure of the LBG as well as the environment and communication. Accordingly, LBGs are designed to reside on the boundary between play and ordinary.

An LBG has a **pronounced** boundary between play and ordinary if the limits of the game are explicit and overt, and the game takes place in a context intended for play. The boundary is **delicate** if limits are not determined or implicit and if the LBG happens in a context framed as ordinary. These are the extremes of a continuum. The more delicate the boundary, the more the player needs to negotiate it. To determine whether the game has a pronounced (indicating: "This is play!") boundary, one can ask[22]:

- To which degree does the LBG claim to be a game?
  - How are the rules, and limits in time, space, and social setting conveyed?
  - What is not clear to the player in terms of rules and limits?
  - What is the intention of the space the LBG is set in related to the intention of the game?

The questions related to a delicate boundary blurring that "this is play" are:

- To which degree does the LBG claim to be a part of the everyday life?
  - How does the game relate to time, space, or social setting of everyday life?
  - How do the appearance and actions of players relate to the contexts they are in and to everyday life (overtly or discretely)?
  - In which contexts do the players' actions have significance outside of play?

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[22] Note that some of the questions are relevant to both sites of the boundary. This goes for the questions posed at the end of each section in this chapter.

- o Which strategies does the LBG use to let players consider aspects of everyday life to be part of the game?
- o Which role does ambiguity play in the design?
- How does the LBG guide players to relate the context of the game (its legibility, literacy and legitimacy)?

In relation to determine how the LBG is designed to affect the players' motivation and mindset toward the world, we can ask:

- To which degree does the LBG seek to motivate players through process?
  - o Which elements in the game lead the players' attention toward process?
  - o Which elements are intended to be used for raising arousal?
  - o How does the player relate to spatial location through the game (exploration and discovery)?
  - o Which conditions in the environment can affect players' motivation, and how?
- To which degree does the LBG seek to motivate players through progress?
  - o Which elements in the game lead the players' attention toward progress?
  - o Which elements are intended to be used for lowering arousal?
  - o How does the player relate to space through the game (moving and advancing)?
  - o Which conditions in the environment can affect players' motivation, and how?

These questions are used in the conclusion of this chapter in relation to categorizing different types of LBGs.

This section on play, the ordinary, and the boundary between them concerns itself with the relation between what is and is not play, and also how the player shifts between playfulness and goal-orientation. It relates to the players' mindset toward the surroundings and thus to the motivation of the player. In the next section, we examine what happens inside the frame of LBGs by looking at the "content" on which the game is based. The focus in the next section is on the significance of actions and objects: how the significance relates to the manifestation (form) of the actions and objects in an LBG and it changes.

6.2   Authenticity and Fiction: Framing

As LBGs are set in ordinary space, the designer can introduce authentic stories about historical events at the locations where they took place, authentic challenges such as looking for a mysterious man in the crowd, and let players experience surroundings such as the buildings at the Open Air Museum that seem authentic to players. At the same time, LBGs bring fiction into the everyday space. LBGs use fiction on different levels. In *Fruit Farmer*, *Ghost Patrol*, and *Foursquare*, the "fiction" is minimal: These games do not tell stories, yet they use metaphors to convey a game theme. On the other hand, *Spy in the City*, *Land of Possibilities?*, and *Visions of Sara* all let players engage in stories and identify with roles. Regardless of the level of use of fiction, LBGs frame actions, events, and objects to be interpreted in a certain way. This in itself creates an understanding of these elements that distinguishes them from our ordinary approach to them. This section analyzes this framing in LBGs. Light is shed upon authenticity and fiction in relation to LBGs. First, LBGs are analyzed in relation to fiction, second, they are related to authenticity, and third, the way LBGs are built around and merge authentic and fictional content is described.

Ascribing meaning to elements in the LBG requires that the player make an effort, and that the designer relates to players' experience of the world. In *Visions of Sara*, players are not exposed to any illustrations of Sara or any of her visions. They must imagine these from the description they are given, and since this is a site-specific LBG, they connect their mental images to the locations in which they find themselves. In order to create images and a belief, the fictional world has to relate to the reality we know. When creating an imaginary world, players are armed with experiences from the "real" world that form their expectations and understanding of what to do (Bartle, 2003; Carson, 2000). Thus, when creating an imaginary world – the fiction – the LBG designer needs to base the fiction on concepts with which players have experience. The advantage of doing this is observed in *Spy in the City*, which is based on a spy-theme, which we know this from movies. Participating in the game, my partner and I, were acting out this theme from the beginning of the game, trying to be discrete, observant, and aware that only we could save the world (or the United States, the setting of the game) from grave danger. The experiences guide the players' understanding of what is taking place in the game, framing the relevant possibilities. By pulling in their experience and creating meaning, the players contribute to the game experience with their knowledge of the world (elaborated in Section 7.3). Players also use the story to explain and include events, such as seams, in the meaningful whole and make a connection beyond the

designed story. The *Visions of Sara* player, Esther, uses the story when the GPS connection is imprecise and seams between systems are shown. Esther exclaims that it is probably the ghosts that are interfering with the connection to hinder their exploration of the mystery. In this way players can use the fictional frame to interface with events.

Players of *Visions of Sara* agree that a story is important in games. One writes: "Well, it would be strange to play a game without a story. Whether it is the *Visions of Sara* story or another story is not important, as long as the story is coherent." [VoS, E-mail, P2, 1] That the story is coherent means the references of the story's content – events, objects, and possible actions – "point in the same direction" in support of each other, i.e., the significance permeates the matter and can thus seem authentic. When the story seems to be "real," it is believable (McGonigal, 2003a). Players of *Visions of Sara* and *Land of Possibilities?* showed their belief in the story by performing according to the story, as shown by the example with Esther above (more findings are treated in the analysis on player experience in Section 7.3.2). Lack of coherence, on the other hand, breaks the pattern of consistency, which can make an event seem pointless – especially if the game does not offer interesting possibilities: Having a sausage thrown at me in a ghost-hunting game is an example of this, which occurred while playing *Ghost Patrol*. This event neither fit the story nor did it underscore the premise of the game – which was supposed to lead the players' focus toward the body, running around and probably building up excitement in battling with ghosts.

Instead of basing the LBG on a story with a plot, designers can create a story or a theme that guides the player. The theme is a "universe" that offers us associations and expectations that are connected with certain references (Carson, 2000; Jenkins, 2004). For instance, the spy theme is connected with hats, glasses, trench coats, gadgets, and a certain behavior (avoid being revealed). *Foursquare*, *Ghost Patrol*, and *Fruit Farmer* all have a theme that helps the player act, but it does not tell a story in itself. A theme is a set of signifiers and relations that points to a certain mood and expression. A commonly known theme has the advantage that the users can use it as a framework of relations they can use to fill in the events and elements that they meet during the game. The designer does not have to worry about creating a coherent sequence with the theme, as it is the players who make the connections. Themes are not connected to specific locations, such as the stories in *Visions of Sara* and *Land of Possibilities?* Rather, they are connected to a shared culture, which means that the LBG can be moved from place to place (within that culture), provided that tasks are not site-specific,

without having to create a new story every time. This is the strategy used in *The Go Game*, an LBG that has been running for the past ten years primarily in the United States (Wink Back Inc., 2008). The purpose of the game, according to the creators, is to create energy and to encourage people to explore their creativity visiting locations in a specific area, and interacting with actors. The developers deal with the issue of making a game based on a story and refrain from making it linear, so that it can be played again mainly by doing themed missions in which the players create stories within the theme. This design approach demonstrates trust in the players' ability to co-create the game and create links between units of content.

The fiction of LBGs can be embedded in locations for players to explore. The garden is a stage for a party (*Land of Possibilities?*), the alley is where the bomb is planed (*Spy in the City*), and the well is the entrance to Antoinette's tomb (*Visions of Sara*). The player can engage in the story using both mind and body, and imagine the connection between location and story while being there and sensing it. Stories in LBGs can thus be organized into more or less authentic locations. In *Spy in the City*, *Land of Possibilities?*, and *Visions of Sara*, the story is structured spatially: Fragments of the story are distributed in various locations in the game space. A linear story with tasks directly connected to the story time only offers one or few planned paths through the story. *Spy in the City* and *Visions of Sara* are both such games of progress, as players progress through the story, and it is a less flexible approach than an emergent game that allows more variation. Often emergent games only provide a vague story or a theme (Juul, 2005).

A story does not have to be time-based sequence progressing, like a path that the protagonist follows through space (Lamm, 2002). It can be an iconographic structure where plan and elements refer to a reality outside of the present one. This is the case with crime stories, like *Visions of Sara,* in which pieces of the plot are scattered at various locations (Sandvik, 2010). By designing various characters related to different themes, with different goals, points of departure, and allowing players to combine encounters between NPCs as they please, *Land of Possibilities?* can be played several times with different outcomes both in terms of the story experienced and points awarded. *Land of Possibilities?* has a non-chronological arrangement of NPCs that organize a fiction into spatial patterns (Lamm, 2002). The story of this LBG is related to the goal of the character the players are playing. There is not a planned route through this story; one encounter does not influence on another encounter with NPCs; there

are no climaxes, planned twists in or a conclusion to the story. Yet players experience the story as a temporal sequence of events (Calleja, 2007). They advance the story by their movement through space. Depending on the sequence, of either the planned path or the path the players choose themselves, the experience of the story will be different.

Figure 49: "Replay" of the actual trajectories of three groups playing Visions of Sara.

Visions of Sara is a game in which the story progresses and it is based on locations; this meant that paths between locations – and story elements – in the game must follow the story and ensure that they all made sense and that solutions to tasks were not given away. *Spy in the City* is also linear and all players play the tasks in the same sequence. Changing the sequence of the game would expose that the story is not fiction and render it less believable, as it loses its coherence in another "appearance" (c.f. Merleau-Ponty, 2002).

If players go for narrative involvement using "identification" with the story as a tool for creating meaning and being aroused, coherence is important. However, not all players experience arousal from experiencing a story. Some of the players in *Visions of Sara* made it clear that the competition was more important than the story. This does not mean that "fiction" is irrelevant to them. It can still be used to create a relation between events and actions in order to guide players (Juul, 2005; Salen & Zimmerman, 2004). *Spy in the City*, *Visions of Sara*, and *Land of Possibilities?* are about exploring a story. *Foursquare*, *Fruit Farmer*, and *Ghost Patrol*, on the other hand, offer "fiction" to frame content and relations in the LBG to help players interpret the game's premise.

"Fiction" can be embedded in the interface to guide players, as is the case with three of the LBGs, e.g., the story in *Fruit Farmer* indicates what you want: the fruit (since you are a farmer), and what you want to avoid: the wasps (since they will eat your fruit and sting you). Being a farmer, you will want to bring your crops to the barn. The player can also be on
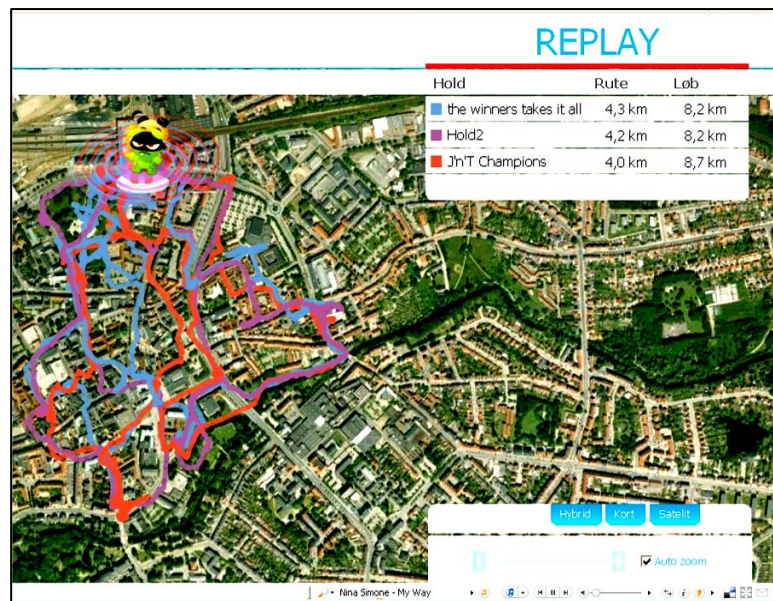
Ghost Patrol exterminating ghosts with special guns; or be a traveler checking in at venues, providing tips about places visited, making to-do lists, and exploring as indicated by a symbol of a compass and possibly browsing through popular locations related to certain topics in *Foursquare.* The fictional theme of *Foursquare* is the least coherent. For instance, most of us are not awarded with badges when traveling (except for scouts, perhaps), nor we do become mayors of locations. In these LBGs that have embedded the story in the interface, players are not expected to enter a fictional world or to be narratively involved. The story is a theme merely suggesting how to make sense of the game content.
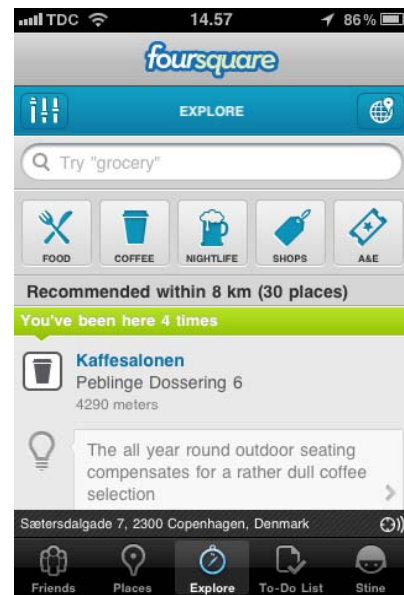
Figure 50: Explorer tab with the compass icon in the *Foursquare* interface

Instead of letting players experience a designed fiction, LBGs can be tools for players to express their own stories and narrate themselves. In *Foursquare* there is no story distributed into the environment, but this does not mean that there is no fiction, or that there is no "fit" between the LBG and locations. *Foursquare* is not designed for a particular location, and this game moves all the time, as it is the players who connect it to locations and to their everyday life actions. Unlike *Fruit Farmer* and *Ghost Patrol,* which are location free, *Foursquare* is site-adaptable (Montola et al., 2009). However, this adaption is not performed by the game system but by the players' actions. The game rewards players for going to places. Players choose which to register and which to show to other players and what comments to make about the place. Players can use *Foursquare*'s framework to act out places and to create an authentic story about themselves, i.e., their movement in and relation to locations. Players can also use *Foursquare* to score points and find strategies that would allow them to earn the most points checking in all over, without really visiting the locations and not caring about what kind of locations they become mayor of, such as the murkiest bars in the neighborhood. However, another strategy is to check-in only at locations that convey some meaning and be selective, so that the check-ins tell a story about where the player goes. Through this selection, the player makes the check-ins represent something about him or herself. Players thus create a story and express themselves through the game. If the expression were merely about earning points, the player would just check-in continuously without a selection to collect points. There are applications that allow this kind of automated

check-ins with *Foursquare*, so that players will not have the hassle of screen-centered interaction, to prevent players from check-in fatigue – i.e., growing sick of checking in all the time (Siegler, 2010). However, this is not the prevailing strategy. This could be because they do not know, e.g., these kinds of applications exist. Chances are that players are not interested in checking in all over due to privacy issues, and that this is not what players want to do with the LBG. By choosing where to check-in, a player creates stories out of his everyday movements. When players check-in at locations, they are not just sharing information about their whereabouts; they are sharing their location with an intention. This intent could be a chance encounter with a friend, sharing their personal opinion about a venue, showing that they are here, or scoring points. It does not matter to which of these purposes other players will ascribe meaning for the check-in, as we are intentional beings (Merleau-Ponty, 2002).

Therefore, players use the LBG as a tool to create fiction and the fiction as a tool to guide their actions. This means that authentic events can be are framed as representations and shared with others. In this way, LBGs can be used to shape and reshape stories providing the opportunity to make stories out of or in the everyday, and experience stories in this context. Players are active in this process using experiences with the world to imagine what is going on and which actions to choose on this basis.

The heading of this section mentions fiction and *authenticity*. Whereas fiction is created for the game, authentic content exists independently of the LBG. Authenticity is relevant in relation to LBGs, as designers can tap into the ordinary world and use authentic content adding fiction and possibilities for action to it. Locations in LBGs are not upheld by

imagination and computers only. Players interact with authentic buildings, statues, friends, etc. via the LBG. What does it mean for LBGs that the elements on which the game is based are not merely fictional? Instead of being preoccupied with how well we can make the form (representation) simulate something, designers can use dissimulation, meaning that extraordinary capabilities of authentic objects are revealed (McGonigal, 2007a) in LBGs (cf. p. 52). In *Spy in the City*, ordinary objects hide codes hidden in texts

Figure 51: The window with the blinds that send a message to players of *Spy in the City*.

on statues and buildings, in ornamentation, and even a set of blinds tell players about the status of the situation (see Figure 51). This creates a feeling that another spy is actually sending us a message – in the present moment while we are playing. *Visions of Sara* also encourage players to attend to objects in their environment that potentially hide other meanings than the apparent ones, or just reveal the actual meaning to players. These authentic elements can become representations in the LBGs.

Authentic elements permeated by certain significance gain new meaning in the LBG when the player interacts with them. The players make this temporary change of significance (Bateson, 2000; Nieuwdorp, 2005). Players of *Visions of Sara* experience this as they need to shift from one interpretation, e.g., of the Cathedral School (*Katedralskolen*) to the one suggested by the game – in this case, the players learn that at this particular location lies the castle's kitchen garden in the 16th century. This information is authentic; however, the LBG

Figure 52: Carl, the lover of Antoinette.

can also give an element intrinsic to the environment a new meaning in the game. In *Visions of Sara*, a statue depicting Count Carl of Flanders is transformed, becoming Antoinette's lover, Carl (Figure 52). This requires that the players use their imaginations and that they temporarily ignore the significance they know is connected to a given thing (Nieuwdorp, 2005). Players enjoyed this challenge, as Jens expressed it was "cool … to find the answer to the question on something that was actually there." He thought that this made it seem like the game "held together pretty well." However, it would not "hold together" without the player or the LBG. The meaning in the game does not really permeate the matter of the statue. The relation exists only as long as the player imagines it, and because the game's designer created the idea of the connection between statue and fiction.

The LBG designer can place the game in an authentic environment (Waern et al., 2009), as is done in *Land of Possibilities?* where players are playing between historic buildings appropriate for the game's setting. The designer can also base the game fiction on "authentic objects" and historical facts, which is the case in *Visions of Sara* and *Land of Possibilities?,* but also on "authentic challenges".

The authenticity does not have to be connected to an object. LBGs are played in the ordinary world, where people not part of the game are moving around. LBGs can let players interact with this "authentic" world too. *Spy in the City* uses this strategy as it gives players footage of a man for whom they are told to be on the outlook. The footage was from a surveillance camera at the building in front of which players are standing (see Figure 53). This makes looking for him seem authentic, as the fabricated footage can resist further examination: It is actually believable that this photo exists. Again, from *Spy in the City*, the tasks are based on real codes used by spies in real missions, and the scenario is authentic, too. Players break codes on which professional spies work. These observations show how the fiction can be made up of authentic content encased in fictional meaning. In this way, LBGs play with the boundary between framing entities in ordinary space as fiction and authentic.

Figure 53: Photo of mailbox and surveillance camera in *Spy in the City*, Washington, D.C.

Authenticity in LBGs extends to the relationship between the intentions of the designer, how the player perceives this intention, and the elements origin. Waern et al. (2009) write that games set in ordinary space can use an environment *perceived* as authentic by the player. It is important to make a distinction between the *intended* perception of something in the game, and the actual *perception* of it. Players can perceive the environment, object, mission, etc. as authentic, because doing so fits with the fiction or content of the LBG, and it could exist independently of the game. The "spy" in the photo in *Spy in the City* could have been at that spot leaving a hidden message for us. It seems plausible we could have met this person on the street, yet the "spy" is clearly fabricated by the designers. *Perceived authenticity* relates to the way the item appears to the player. The authentic item can withstand extensive exploration and is independent of the player and designer. Authenticity also relates to the relationship between the player's perception of the item and of the designer's intent with the item. In this way, players can perceive something as created for the game and thus as an intended part of the game, although it is not. They apply the game logic to it; by coincidence, there is a fit. This is an example of *apophenia* (Dansey, 2008), players inclusion of elements in the game that were not designed to be part of it. Observations of such connections are analyzed in Chapter

7. Then there is *coincidence* (Reid, 2008), which is a connection between elements that seems to be independent of the designer, but are intended.

Players can purposefully apply the game logic to elements that they do not perceive as intended to be part of the game – a problem they are solving, surveillance cameras in another town, or just beginning to pay closer attention to the environment they played the LBG in after the game has ended. This is similar to what McGonigal (2003a) dubs "gaming reality": players apply methods and perspectives from the game to everyday life. In *Foursquare*, players apply the game logic to places that the designers have no chance of knowing. In this way, *Foursquare* is about seeing the gameness in the surroundings, even where there is not intended. Additionally, there is game content intended to be part of the game and perceived as created for the game, which is *fiction*. There is content intended for the game but not perceived as such, which is just *"wasted" content*. Finally, there is the content not intended for the game, and not perceived as such, which is *not part of the game.* In Chapter 3 two questions where posed relating to how is performing the framing, and how content is framed (cf., p.52). The table below illustrates the relation between the designer's actual intention, perceived intention, and the content's dependency of player and designer:

Player⟍ Designer	*Perceived* as intended and *designed for* game	*Perceived* as being intended for but *independent of* game	**Not** *perceived* as being intended but *related to game by player*	**Not** *perceived* as being intended
Not intended	Apophenia	Apophenia Perceived authentic	Gaming reality	Not part of the game
Intended	Fiction	Perceived authentic "Coincidence"	Gaming reality "Coincidence"	"Wasted" content

Table 1: Intention and perception in relation to designed and experienced content.

This table can be used for analyzing the content of LBGs, and by designers as a tool to be aware of these axes, so that they can make use of these categories. When the LBG designer aims at creating LBG content that can be perceived as "authentic," he can attempt to establish that even if put to the test or broken into pieces, the LBG's content will be pervaded by the game's significance. The more the "representations," i.e., objects, events, and people that convey something in the game seem independent of the players' imagination

and the more they could exist without the LBG, the more authentic the content seems. Thus, it was perceived as authentic when we were asked whether a certain set of blinds was up or down in *Spy in the City*, this being a message received from another agent. Players know that the status of the blinds is an independent element. They were not controlled by the game or imagined by us and thus it seemed "authentic." Table 1 relates to the boundary between authenticity and fiction that depends on player's interpretation of intentions and dependencies of entities, and how these are framed.

In Chapter 3 it was asked how and by whom the relation between location and in-game meaning is created, and how this relation connects to the properties of the locations (cf., p.52). LBGs that incorporate elements in the physical surroundings have different connections to the significance of these elements. Through this study, six types of connections have been observed in the LBGs. These are divided into two levels. The first level is concerned with the element's relation to time and space. The elements are either *static* or *dynamic*. The second level is concerned with the elements' relation to the LBG. The elements can be *placed*, *staged,* or *player-incorporated*. These categories are elaborated separately below and unified in a model in the end of this section.

Static elements are characterized by being stationary, fixed elements that typically have been at the same location for some time. These elements are *expected* to be at the location permanently. This encompasses buildings (including their ornaments, windows, doors, etc.), statues, street names, some shops, gardens (and certain elements in

Figure 54: The inscription on St. Alban church used in *Visions of Sara* is an example of a static element.

them), playgrounds, etc. The advantage about static elements is that the designer can be quite sure that they stay where they are and can thus base tasks and/or storylines on them and use them to design for the player's senses (cf. Section 7.1). The disadvantage of static elements is that the game can become predictable to the player if all the tasks involve statues and the like. Players in *Visions of Sara* expressed that they were mainly searching for static elements in their surroundings when they learned that this is the basis of the game.

Dynamic elements cannot be expected to stay at one location or to exist at all times. An example of such an element is the blinds in *Spy in the City*, mentioned above. They might or might not be there. If the blinds are there, they might be up or down. In *Visions of Sara*, base agents are instructed to find a book at the library. This is a dynamic element as well. Although the book was listed as being out on loan in the library system, we could not be sure if somebody had moved it or taken it. Neither blinds nor book are initially created for the game, and dynamic elements do not have to be, but they can be. The advantage about the use of a dynamic element is that it creates a feeling of "authenticity," since designers cannot trust it will be at a certain place; thus, it seems more independent than a static element. LBGs are set in living environments, in places that change (de Certeau, 1988; Massey, 1993), in a messy environment (Nova & Girardin, 2009). Using dynamic elements is in that sense truthful to the character of the city, and a particular possibility for LBGs. Reid's (2008) three types of coincidences, natural, feigned and social, are examples of dynamic elements that are perceived as independent of designers but related to the game (cf. p. 56). The dynamic LBG element can seem to be "alive." A reason for this, in the case of the blinds, is that the dynamic element is framed as a sign from a "living" agent. As the dynamic element is not fixed, and as it is independent of the game (designer), this is plausible. Players can sometimes alter or move the dynamic element – such as hiding the book. This means that the player can leave his/her impression via the dynamic element or change the status of it, and affordances increase. This is also linked to the disadvantage about dynamic elements, which is that the elements might not be there, which could cause the players to spend time finding them and/or cause the loss of important parts of the game. This means that if an LBG designer is integrating dynamic elements into the game, he/she must consider the outcome if the element is missing or changed. The designer can be less certain about dynamic than static elements.

This first level describes elements as either static or dynamic, which is concerned with the elements' horizons in time and place. The second level looks at the element's relation to the LBG: It regards whether the element is initially intended for the game, and whether if it is made part of the game by designers or players.

Placed elements are elements that the designer has placed in the environment for the purpose of the game. These can be props or information embedded in the physical environment via an RFID chip, in geo-zones, or similar. The placed element can be either

dynamic or static, but it is always intended for the game from the outset. In *Spy in the City* players have a spy-device, but apart from that in none of the LBGs observed were there physically placed elements. Normally, LBGs do not use staged environments, as is done in pervasive games (Waern et al., 2009). However, *URAAY* presents players with an office that is full of placed elements. When actors or props are placed in environment to appear "natural," Reid calls this "feigned coincidence" (Reid, 2008).

Digital elements are also mapped onto physical space in LBGs (Walther, 2007a). *Fruit Farmer* adds virtual fruit, walls, and a barn to various locations in the physical environment. *Ghost Patrol* adds ghosts and weapon to locations in the physical world. In these two games, placed digital information is not incorporated into the environment but laid on top it as a mixed reality space (cf., Section 3.1.3). The hidden message and fingerprints found at physical locations in *Spy in the City*, on the other hand, are attempted to be woven into the fabric of the ordinary world as a hybrid space (cf., Section 3.1.3). The digital information placed by *Foursquare* players augments physical space as it relates to it (as opposed to the ghosts in *Ghost* Patrol), but it is not merged into its surface. All LBGs distribute digital information in a physical environment, as they have geo-zones.

The advantage of placed elements is that they should support the LBG, as they are brought into the environment with this intention. Placed elements can also be controlled by the designer, or triggered by events, making it is possible to target them toward the players in relevant situations. Especially, placed elements that are coded can be hidden, revealed, and adapted to the situation, since they are coded (Hayles, 2004). The disadvantage about a placed element is, if it is physical, that it requires maintenance and can be destroyed. Moreover, a dynamic physical element requires more resources than merely using elements that are intrinsic to the environment. Using too many placed digital elements may mean that players' interaction with the physical environment in which they find themselves, is reduced or even rendered unnecessary for the game-play. *Foursquare* has a tendency of being an LBG very much focused on digital content. This means that the meeting between physical space and player can end up not being meaningful, because the player can play the game without really *being* at the locations by cheating.

Staged elements are not originally intended for the LBG but are intentionally staged or framed as part of the meaningful whole by the designers of the LBG. These elements can be

either dynamic or static. Players might know the element from another context and might have associations with the element from which they might to need to distance themselves (Nieuwdorp, 2005). Players knowledgeable about Danish history experience this in *Visions of Sara* when they encounter an ornament depicting three lions surrounded by hearts, i.e., the Danish national arms, which players by interpreting a poem learn is a symbol of three persons in a triangular drama in the story. Through *Spy in the City* and *Visions of Sara*, designers have staged elements such as statues, blinds, and books. Their references can be changed, so that they denote something other than their conventional denotation (Bateson, 2000; Nieuwdorp, 2005). Within the frame of the LBG, these elements are woven into the fabric of the experience. The advantage of using staged elements in the game is that the players can see new things in their environment, which are intrinsic to this environment. It is possible to make an LBG in which players are paying attention to normal everyday space and see *it* in a new way. This also means that the next time the player is walking in that particular part of town, he/she can see elements from the game in the environment if they are static – they can "bring something home" from the experience (Boswijk et al., 2005). On the other hand, a drawback can be that the elements denote certain things, which mean that it can be challenging to make change the association of these elements if the connotations are strong. Further, the designer has less control over how and where the staged elements appear compared with placed elements, which must be deliberately chosen.

Player-incorporated elements are not specifically intended to be a part of the LBG by designers. These elements can be dynamic or static. The element is made part of the game by the player, who connects the element to the meaningful whole through his/her actions using the frame of the game. Players can also incorporate authentic elements as an intended and planned part of the LBG. This is the case with *Foursquare* in which players create links to venues, describing them, adding tips, and perhaps even a photo. The player at the IT-University is another example. He invites other players to interact with their physical surroundings – in his case, he instructs them to create an element themselves: a paper plane. Players of *Foursquare* have also even created a new location by making Platform 9¾ at Kings Cross Station (this is elaborated in Section 7.3.2). Players can also incorporate elements into the game, although this is unintended. This is seen in *Visions of Sara* when the player Claus thinks that he is finding the answer to a route task by looking at ornamentation on a wall that coincidentally helps him (we will get back to this observation in Chapter 7); further, it is observed when another group of high school students connects their school, nicknamed "the

cat," to the game's story. It is a coincidence that these connections can be made, but the players think that it is an intended part of the game (Dansey, 2008; Reid, 2008). This occurs in LBGs that encompass everyday elements (either staged or placed). In these LBGs, players frame elements of the environment, changing their meaning and shifting between realities (Bateson, 2000; Nieuwdorp, 2005). This differentiates LBGs set in everyday space from traditional digital games, in which everything that the player encounters is made to be played with, to create an atmosphere, or to guide the player. Designers can increase the probability of players making such connections by studying the environment in which the LBG is set, and linking tasks and story to the 'rhythm of this environment' (Walz, 2010) or that relates to practices in it (Reid, 2008). For instance, if we had been asked to keep an eye out for a business suitcase in downtown Washington, D.C. playing *Spy in the City*, it is very likely that we would have found one.

Figure 55: Field agents in *Visions of Sara* have found a statue that can help them solve a puzzle in the game. The LBG does not guide them toward this. They have incorporated it themselves.

The designer is not in control of the player-incorporated elements, but can design a pattern of perception (intuition) and make interpretation possible that will enable and encourage players to incorporate elements themselves. Letting ambiguity be part of the game is a way of opening the game to interpretations, making it plausible that the players will incorporate elements themselves. The advantage of letting players incorporate elements is that the frame of the game is connected to the ordinary world and can augment or enchant it. Players are very active in creating meaning and co-creating the LBG, which means that they can become very engaged in the game, which then seems more authentic.

The relation between content and in-game meaning, and how this relation connects to the properties of the content has been examined. Below is an illustration of the relationship between the two levels. This offers an overview of how content is brought into and framed LBGs:

	Placed	Staged	Player-incorporated
In Common	- Intended for game (but not necessarily created for the game) - Can be either digital or physical - Either separate from, overlaid or intertwined with location	- Assigned significance by designers - The element has its own life: intention and story - Not originally intended for the game - The player *might* change the connotation of the element in the frame of the game - Intrinsic to the environment. - Denote certain things, which can make it authentic or can work against the LBG fiction	- Not intended for the game - Player is (autonomously) creating the link to environment and element - The player changes the connotation of the element in the frame of the game - Requires encouragement or ambiguity in the framing - Has meaning for the player within the frame of the game
Dynamic	- Placed by designers - Requires maintenance - Might disappear/be ruined, etc. - Can sometimes be affected by the player	- The designer does not know the state of it - Might disappear/be ruined, etc. (though risk is low) - Can sometimes be affected by the player	- The designer does not know the state of it - It does not matter what state it is in
Static	- Built into the environment by designers	- Can last after the game, reminding the players of the game	

Table 2: Depicting placed, staged, and player-incorporated elements.

The designer's problem of controlling placed and staged dynamic elements is decreased when players incorporate the dynamic elements, as the player links the element in the current state to the game. In this case, if the dynamic element changes, the player has the power to update or reframe it. When it is part of game-play that players incorporate elements into the LBG, it thus becomes more dynamic, and potentially more authentic, as it can be adapted to the situation. On the other hand, the LBGs in which elements are staged and placed by designers are more tied to a location and thus less flexible, except in the cases in which placed elements are digital and not directly linked to the specific location. In the latter case, the LBG can be moved from location to location, as it is independent of them. Note that players are still interfacing with placed and staged elements. However, these are specifically intended to be part of the LBG by the designer; whereas player incorporated elements are not.

LBGs can be designed to include authentic elements and events into the player experience. On the other hand, the structure of LBGs allows players to be producers, for they need to imagine, act on, and create the relations between game, fiction, and authenticity. This section has concerned itself with the significance of elements and actions in the game: The framing and organization of content. Content brought into the LBG is introduced deliberately by either designer or player. In combination with their static or dynamic nature, this affects how they are perceived.

An LBG's content can be based on authentic content (locations, things, events, and actions) to which another meaning can be assigned temporally or added, or it can represent itself. The LBG can also aim at telling a story by submerging the player into a fictive world while in everyday space, so that the player can get involved in a narrative. These two strategies are not mutually exclusive. The LBG can be designed so that content is supposed to seem authentic. On the other hand, the LBG can present content explicitly related to something imaginary.

To determine to which degree the game is based on *authentic* content, we can ask:
- To which degree is the game's content based on something authentic?
  - How does the game relate to and include authentic environments, event, actual friends, (non-game) actions, or authentic problems?
  - How does the LBG relate to indexical actions?
  - How is the designer's intention with elements conveyed?
  - How does the game's framework apply to areas of the players' everyday life as content?
  - How does the game enable players to make links between LBG and content themselves?
  - To which degree and how does content depend on players and designers?

On the other hand, we can find out which role *fiction* has in an LBG by asking:
- To which degree does the game tell a story?
  - What is the fiction of the game?
  - Which function does this fiction have?
  - How does the LBG augment locations with fiction?
  - What is the coherence in the fiction?

- o Which elements of the game show that its focus is on an imaginary world and how (if any)?
- o How are elements framed as being part of the fiction?

We will return to these questions in the conclusion of this chapter. In the next section, the focus shifts from framing the content to the media used in LBGs. Here, we are concerned with either physical or digital media. Using physical media gives LBG designers new possibilities with regard to designing for the space of bodily presence without having to abandon the flexibility of digital space. The next section explores physical and digital space as media through which the player acts and representations are made.

6.3   Physical and Digital: Media

In LBGs, both physical and digital media are used to convey the game. We find variance from LBG to LBG regarding how much emphasis is placed on using either physical or digital media. In this section, first I present how features of *physical space* can be used in the LBG design: An LBG designer has the opportunity to design for the senses, as physical space is a part of game space in LBGs. Second, *digital spaces* as a medium are explored. Finally, I discuss the possibilities these two types of media offer to LBGs. Again, when playing, there is no clear cut distinction between these media: players use them concurrently without moving away from either of them, and through use, they merge physical and digital spaces (de Souza e Silva, 2006). When we design the LBG, however, there is a distinction, and the designer must decide which elements should be represented physically and which digitally (Benford, Magerkurth, & Ljungstrand, 2007).

According to Boswijk et al. (2005), experience settings need to involve the five senses. LBGs give us the opportunity to design for all the players' senses, as these games are set in a physical space. Merleau-Ponty's (2002) theoretical perspective concerning the LBG experience puts the emphasis on the body of the player and on how he or she is in continuous communication with the world. If this relationship is truly interactive, then the (physical) world can push and affect the player's experience. Players experience the physical world through their senses; thus, in this section, how the senses are stimulated or involved in the LBGs is analyzed.

Probably the most used of our senses in LBGs is *sight*. It could potentially be dangerous and impossible for a blind person to play any of the LBGs analyzed here, due to the way the games are created. Players need to look at the interface, look around to find something, look to read, etc. The LBGs do not put equal emphasis on letting players look for things in their environment. In *Fruit Farmer* and *Ghost Patrol*, players must keep an eye out for threats and rewards on-screen, and respond to them quickly. In *Foursquare*, most of the interaction is on-screen, reading comments, finding places, etc. *Spy in the City* and *Visions of Sara* are all about finding details in the physical environment. The game-play in these games is based on the players' ability to find these things. Players must focus on objects in these games that are about exploration.

Sound is pervasive, as it surrounds us and blends into the physical space. It requires attention, but it is not as exclusive as visual content: We can hear the doorbell and the radio simultaneously. On the other hand, we cannot look at the screen of a mobile phone and the building in front of us concurrently. Visual content demands that we are drawn toward its location to perceive it. Sound leads us toward its origin (Merleau-Ponty, 2002). This means that it is easier to ignore visual content than sound. *Spy in the City* and *Land of Possibilities?* both provide audio-material for the player. In *Spy in the City*, the players were shown the agent boss via a video clip with sound. In *Land of Possibilities?*, the speech of NPCs was presented as audio clips. Sounds of a garden party, heard coming from the speakers of the players' devices in *Land of Possibilities?*, make the garden come alive, and such sounds makes the game's universe believable. In *Visions of Sara*, several of the players mention the poor sound quality on the phones. Yet this was also mentioned as a good thing, because it is part of the challenge and experience: The player Claus thought having to speak on the noisy phone made him feel like a "real" agent. In this example, the technology works as a stage prop (Waern et al., 2009), for it increases the player's spatial and sensuous involvement in the game. In these observations, sound adds to the atmosphere of the games and a place (the garden). In *Land of Possibilities?* and *Spy in the City*, audio instructions are used indirectly to guide players: They listen to a story that sometimes indicates what to do or where to go. However, players still need to look at a screen to navigate their surroundings. Further, players cannot use their own ability to create sound or speak as an action in any of the games. A group of girls, e.g., playing Karen in *Land of Possibilities?* try to speak to a NPC; at one point they answer the NPC's question with a loud "yes" but receive no response. I have not myself experienced LBGs in which sound as a stand-alone (without use of a screen) is

guiding players. A notable attempt at creating a more sound-based interface for an LBG is seen with researchers from the *Center for Interactive Spaces* at *Aarhus University* and the theater *Katapult*. Together they have developed an audio drama called *The Chosen* (De udvalgte) set in *Hasle Bakker* outside of Aarhus. In this LBG, each player has a mobile phone with a headset. They find two-dimensional barcodes scattered along a route that they activate with a phone and then an audio file plays. The players navigate space in this game via a map (Grønbæk, Hansen, Kortbek, & Christensen, 2010). Another notable design and research in this area is done by Erik Kristiansen, who designed the audio-based game *Klintespillet* at Møns Klint in Denmark (Kristiansen, 2009). He argues that using audio is a way of keeping the technology in the background, so that players can focus on the location and the game (Kristiansen, 2010).

In the previous chapter, we went to the *Land of Possibilities?* with a group of players playing Karen who lived at the poorhouse. The players enter the poorhouse, and they are appalled by the *smell*. They cannot wait to escape the place. The smell has not been engineered by the game's designers, although it can be an example of a natural coincidence if it was a planned part of the game (Reid, 2008). It is there, and it fits well with the story and enhances it and the spatial and sensuous involvement. This experience motivates them to "fly the nest" and thereby take on the goal of the game: to get to the "Land of Possibilities." Smell is sensory input difficult to simulate with digital media (Epstein & Vergani, 2006). However, even in physical space, smell can be hard to design for, as it is ephemeral. Nevertheless, if there is some probability of the presence of a smell that could enhance the experience, it is worthwhile sending the players through the area in which the smell might be. We find an example of smell being deliberately included as a part of the experience with *History Unwired*, a walking tour supported by mobile technology created by the Massachusetts Institute of Technology and the University of Venice (Epstein & Vergani, 2006). Here, the tour passes a bakery and it goes into pause screen to encourage players to visit the bakery and enjoy the smell and perhaps even a *taste* of freshly baked bread (Epstein & Vergani, 2006).

LBG players are physically present in the environment in which the game unfolds. Their bodies are affected by the *spatial properties* such as the shape and scale of immediate surroundings (Lamm, 2002; Merleau-Ponty, 2002). When creating *Visions of Sara* in Odense, paths were designed, so that players were sent into environments that could affect their bodies. Narrow spaces, open spaces, enclosed spaces, etc. that would work as refuges or

secret spaces were scouted. The path was laid through an alleyway that closed in on the player, and an enclosed space in the convent garden, that could afford the sense of "leaving the world" for a few moments, was used as the location were the nun Antoinette was killed (see Figure 56). A task was created for the town square in which field agents had to look toward the top of the tall town hall, which can almost make one dizzy, as players have to crane their heads back and bend their necks to see it. The player, Elsebeth, noted that she enjoyed how the game guided her attention all the way to the top of the city hall, and that she had to look even further up

Figure 56: The secluded convent garden in which the murder happened.

than expected. She particularly enjoyed this, because it revealed a huge statue that she had never seen before. The spatial properties expanded her sense of the place. The environment affects our attention, our intentionality, and thus our experience (Merleau-Ponty, 2002). As LBGs are set in physical environments, it is possible to exploit the effect that the scale, equilibrium, weight, and tension of the surrounding area has on our bodies. This approach to using experiential aspects is purposely used in *Visions of Sara*.

In the theory section, Aarseth was quoted on the importance of space in games. He notes that screen-based digital games can be classified as to how they represent or implement space (Aarseth, 2001). The analysis provided above does not depict how the core game-play in the games is related to space, but rather offers findings in relation to how physical space can contribute to spatial and sensuous involvement in LBGs. However, a defining feature for LBGs is their relation to locations in terms of game-play. *Land of Possibilities?*, *Fruit Farmer*, *Visions of Sara*, and *Spy in the City* all challenge the players' abilities in *orientation*. This challenge is closely linked to locations and the structure of space. Yet this is not exclusive to games set in physical space. An example of digital games in which orienteering plays a central role can be found in first-person shooter games in general, in which the player has to watch out for the enemy, find his/her way through maze-like environments, and locate strategically important objects. However, the experience is different, because LBG players navigate a physical environment. A player must use her entire body to navigate this space. In *Fruit Farmer*, *acceleration* and *balance* are also required by the players, as digital killer wasps hunt them in digital space, but the players must escape in physical space. As they escape, they need to

run and sometimes even change directions. When several players are competing, then the players must watch out and not collide in the physical world. In cases including orientation, acceleration, and balance, the LBG directs the players' attention toward a relation between the physical space and their own bodies, interfaced by the game. Players are challenged physically in these games and are on the move.

In LBGs, it is possible to design for and take advantage of all the senses of the players. It has been shown how sight, sound, smell, taste, scale, equilibrium, weight, tension, orientation, acceleration, and balance can be used in LBGs. This design potential is one of the points that distinguishes LBGs from video games: LBGs can involve all of the senses and the player's bodily presence in the design. This can be both related to letting physical space provide an atmosphere to the LBG and to the game-play. The physical space can also serve as a scene for participation, letting players play with the possibilities and limits of their bodies.

The potential to use physical space is enhanced with the use of digital media in LBGs. Murray (1998) writes that the computer extends human powers, and Hayles (2004) emphasize how computers can enhance thinking processes since cognition is distributed between user and machine (cf. p. 40). In digital spaces, I "can" dunk, slay dragons, visit imaginary places, and dribble like the world's best soccer player Lionel Messi, or at least I can control an avatar that can do all these things. This kind of ***transcendence*** is different with location-aware technology and thus LBGs: Instead of creating an alternative reality in a digital space, location-aware technology can enhance the physical environment that we inhabit by augmenting the richness of it, augmenting the players' abilities, or extending the players' reach: Digital code allows us to reach beyond the space of bodily presence, as it is representational and can thus be saved and shared. At the same time, it allows us to act: to send messages, to display our position, change the state of a game, etc. In *Foursquare*, players can compete over "leaderboards" and "mayorships" with strangers. They can leave information at various locations that lingers after they have left but that they can still access after leaving. Players can create information and map the world with it via digital space (Gordon, 2009). LBG designers can also augment physical space with information for players to explore, as is the case in *Ghost Patrol* that maps an army of ghosts and monsters onto the player's surroundings. Players can interact with these representations, e.g., eliminating the ghosts. *Visions of Sara* allows the player access to the history of Odense, as it is fragmented and distributed into locations for players to recombine. Players can reach into the past

playing the game, and the game makes it possible for players to change their perception of a known location – a feature that was enjoyed by players. A player gave the example that he liked that a statue that he would normally just pass by, but that after having played the game, it became the center of attention.

Through the use of digital media, we can retrieve information from an environment in relation to the weather, traffic, or similar and use it in the LBGs. We can also track the movements of players, as smart phones get more sensors *self-monitoring*, i.e., tracking players and turning their bodies into data space, which allows players to *transcend* their "normal" perspective on their own bodies. Similar to the data space Manovich (2006) writes about, a challenge with this bodily data space is to use the data as a material. This is attempted the game *HeartBeat*, a game inspired by traditional tag and capture-the-flag games, in which players are equipped with Wi-Fi or GPS devices and their heart beat is monitored and used as a parameter in the game (Magielse & Markopoulos, 2009). The LBG can give players a fresh perspective on physical space and the body, as they combine digital code and physical space: Players can shift between moving in and observing physical space from above almost instantly. LBGs allow players to transcend the horizons of time and space, which we are normally bound by, extending the reach and abilities of the players in physical space.

By weaving digital and physical media together, LBGs can challenge the conventional interfaces that encompass screen, keyboard, mouse, and game controllers connected to one central unit, e.g., a computer or a console. In LBGs, computation is often distributed in an environment. The interface takes a variety of forms: It might be something like a phone that we recognize as an interface, but it might also involve artifacts that we normally do not regard as a part of a software system, e.g., the player (Nieuwdorp, 2005), who translates between the actions carried out and the game system by documenting events. The player mediates between the ordinary world and the game, by leaving the original meaning behind and imagining new meanings of elements in physical space (Nieuwdorp, 2005). It is the players of *Visions of Sara* who interface between the story and various locations, e.g., imagining that Count Carl of Flanders is a monk and Antoinette's lover. The interface in LBGs can also be artifacts themselves that can hold hidden information or offer the player game-related options, like a postcard players are writing and mailing in *URAAY* or the book in *Visions of Sara*. In *Spy in the City*, a task is to scan the surface of a mailbox with my special spy-agent device to find hidden messages by moving the device up and down systematically

across the surface of the mailbox. On the screen of the message "scanning" appears. Can it be that there was a chip with information hidden under the surface of what looks like a seemingly normal mailbox? Suddenly, the screen changes: A message has been found. Points and information are given, and the game moves to a new state. A hidden world is revealed and the mailbox takes on a completely new meaning in the game, due to how digital code can hide and reveal content (Hayles, 2004). The mailbox and device are part of the interface with which players can interact. As mentioned, the mailbox is actually not *really* part of the interface, as there is no chip. This means that the interaction with it is not really recognized by the game system, but it was staged as though it were an indexical action.
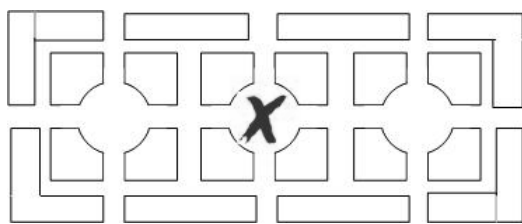

Figure 57: X marks the entrance to the tunnel in which Antoinette was found dead.

Although it is possible to challenge the use of software interfaces, often LBGs are still drawing on the conventions and limitations of traditional interactive systems. In *Visions of Sara, Land of Possibilities?, Fruit Farmer, Spy in the City, Ghost Patrol*, and *Foursquare*, a considerable part of the interaction takes place via either a fairly traditional web interface or a smart phone. However, in developing these games, the designers had to deal with the issue of not having a single entry point of control (Dourish, 2004). The issue that there is no one single entry point of control means designers must consider how the actions they design for can be recorded by the game that the game-state can reflect the players' actions. Thus, the designer needs to consider how the game "knows" what the players have done. This was the case in designing *Visions of Sara*, particularly in relation to the task in which the field agent must locate access to the tunnel where Antoinette met her lover and where she met her fate in the end. The field agent has a map that indicates the location (see Figure 57). The platform used did not support making two geo-zones simultaneously (the flag and the location of the tunnel), so that the system would know when the location was found. Two input possibilities in the traditional interface were A) to let the base agent enter text or B) to choose an option of multiple answers. The solution was to let the field agent find the spot and the name of the garden. This name was written on a gate, and thus the player could spell it exactly as it was entered into the system. The challenge is to handle how natural actions in the physical environment are recorded and weighted in the LBG. This issue is less pronounced when the LBG is designed around certain devices that rely on their possible inputs and outputs. In addition, the devices easily take the player's attention away from his/her surroundings. We

might end up with merely spiced-up virtual experience (Waern et al., 2009). Addressing this issue through the development of technology and game design is pivotal in order to create LBGs that allow players to interact with their environment. Here one of the challenges is to allow the players to record their actions, rate each other's actions, etc. This requires that players are able to negotiate the rules and be participants in creating the game, and that they have a lusory attitude, accepting the rules.

LBGs weave digital and physical space together, often without showing exactly where the areas included by the code are in the physical space. In *Visions of Sara*, the digital space consists of the map that the base agent sees and representations of the movement that the field agent executes in physical space. Digital information is distributed into physical space as well. Play-space, in which field agents perform their actions, is in the realm of physical space and for some of these actions, their movement is "seen" by the system. In *Visions of Sara*, actions are not only movements but also a line of choices performed in cooperation between base agent and field agent: The base agent is trying to guide the field agent in the right direction, the field agent moves, and this movement is displayed on-screen. When the field agent is at a flag, in a geo-zone recognized by the system, then the situation is a bit different. The location is a "representational space" in two ways: First, at most flags, players get a description of one of Sara's visions. This fiction is described and often elements from the immediate environment are woven into the story. Second, the field agent can often find something at the scene linked to the game, representing something from the story to the player. Finding this element is the action performed at the location as well as figuring out how to use the information. The content of the geo-zone is not controlled by the computer, but its location, extent, and the timing of its presence are. The geo-zone is not displayed to the field agents; thus, they do not know when and where they are active. They are hidden layers of code (Hayles, 2004).

When LBGs relate to physical and digital systems seams emerge. This is both experienced as confusing to and embraced by players. The seams (Benford et al., 2003) between physical and digital space in *Visions of Sara* are hidden. Players responded to these seams when they did appear. A base agent in the game *DJEEO Education* responded by being frustrated, trying to make her partners "stay at the flag." [D.E., KS, 1] The girl was looking at the map on-screen on which were displayed a flag and an icon depicting her partners, the field agents. The game first reports that the field agents were close to the flag, and then the field agents

moved away again. The girl did not understand why the field agents did not stay by the flag. She turned to the teacher in frustration and said: "They are standing there by the flag." [D.E., KS, 2] The teacher told her there was not actually a physical flag where they stood, and the field agent could not see the actual location of the flag. This surprised the girl, who had apparently not fully appreciated how she and her partners had different access to their respective context. In this situation, the representation of a flag must have caused the girl to think that there was an actual flag at the field agents' location. Although the flag on the screen looks like something that is actually there, it does not exist in the physical world. The girl put more emphasis on the information that the system provided than what her partners told her. Nova and Girardin (2009) describe that the first reaction to a loss in translation is to believe the system – which she did – but acknowledge that something is wrong. However, the girl was convinced that her partners were the ones creating this problem, as they would not do as she told them, although they might have done exactly what she asked them to do. In fact, when she saw that her partners were in the zone and asked them to stop, they could have been at a different location from the one depicted on-screen. This situation of a mismatch between actual and represented position happens when the field agents make a sprint, they "outrun" the representation of their position. Players find out about this and start asking where their partner "really" is. Base agents stop trusting the digital representation blindly, and learn to inquire about the actual physical location. Also, as mentioned, players of *Visions of Sara* have used the fiction of the game to embrace the seam claiming that ghosts are interfering (cf. p. 191). This does not solve the situation, but it makes the gaps in translation relevant in the game rather than just a nuisance.

In both *Fruit Farmer* and *Land of Possibilities?*, seams are handled by trying to avoid them. Thus players in *Land of Possibilities?* are instructed not to go into the houses exhibitioned at the museum, as this can cause the GPS to lose connection. Similarly, players in *Fruit Farmer* are encouraged to set games up in parks or similar places, that are safe and have undisturbed satellite access. In these games players have access to the information from both spaces via their device that displays a map and the player's (the GPS') location. They experience the seams differently, since they have access to both spaces. A group of girls playing *Land of Possibilities?* ended up in a lake – or in the representation of a lake. Suddenly one of the girls exclaims surprise that they are standing in the middle of a lake (on the screen). However, they are actually standing in a (somewhat soggy) field. Here, the girls experience how

representation and actual space are not identical, and that the information provided cannot always be trusted.

The physical world is closely related to time. On the other hand, the satellite view on a map is a representation, but it is close to the physical space that we know through our body. The park is not just a green plane – in the satellite view on the map, the user can see that there are grass, trees, and bushes there as well. As the satellite view is composed of photos, the representation seems very close to the space it represents. The map is an interface translating between the physical space and the player. However, here there can be a gap between representation and actual space. We experienced this playing *DJEEO Education* in Svendborg, where we were looking for a statue. We could see the statue on the map, but it turned out the statue was no longer there. The map is providing players with ambiguous information (cf. Gaver et al., 2003).

Using digital space, LBG designers and players can add information to physical space, and create zones of interactions. Digital space can also expand the players' reach in time and space, e.g., a player can communicate in real time with other players at distant locations, or see what was at this location years ago. Digital code allows players of LBGs to transcend the limits of physical space in certain ways. Using digital space, we can divide or unite the structural reading of space from above via maps and the sensuous, experiential readings of space.

LBGs can affect our senses through including sound, smell, scale, equilibrium, weight, tension, navigation, acceleration, balance, etc. Physical space can be used to create an atmosphere or be part of game-play. These examples do not exhaust all possibilities, but they do demonstrate that LBGs possess potential for augmenting or tapping into the richness of the physical world. On the other hand, LBGs can also encompass digital space. LBGs merge physical and digital media. To determine to which degree physical space plays a role in an LBG, we can ask:

- To which degree does the player use his full body?
    - Which senses does the game stimulate, and how?
    - How does the game challenge the player bodily?
- To which degree does the LBG use physical space as a scene for play?
    - Which aspects of the locations affect players' game experience?

- How is the fit between atmosphere of the location (if it is a specific location) and the game?
- What are locations used for in the game?
- Toward which spatial elements are the players' attentions directed?

On the other hand, we can get an idea about the use of digital media, and its relation to physical media in an LBG by asking:

- To which degree does the technology expand players reach?
  - How does use of the digital media expand the reach of the player spatially, temporally, and socially?
  - Which perspectives does the use of digital media open to the player that would otherwise not be available?
  - What is the relation between game-play and use of digital media (could the game be played without it)?
  - What is the relation between physical and digital media (separate, overlaid or intertwined)?
- To which degree does the technology require the player's attention?
  - What is the significance of the digital information in relation to information from the physical surroundings?
  - How does the game add digital information to the physical world?
  - How does the game support blended attention?

These questions, and the questions formulated previously, are woven together in the final section, which concludes the chapter.

6.4   Structures of Location-based Games: Conclusion

LBGs are played in the ordinary world, and in physical space, they can tap into the significance of everyday life and provide authentic environments, actions, and elements. The boundaries affect players' perceptions of their surroundings and the events in the game. The boundaries and the experience of locations and action in it are related. It is by affecting the motivation of the players, through frame design that relates to content and by choosing the mix of media, that the LBG designer guides players toward ways of interacting with and perceiving locations. Consequently, when we describe the role of spatiality in relation to

LBGs, we must consider how players' motivation and thus mindset toward their surroundings is affected; how elements are framed – both those that are and are not intended to part of the game; and the use and application of digital and physical media.

These dimensions should not be understood as separate. The boundaries are not experienced as clear but ambiguous; although when designing LBGs, designers must remember each of these dimensions to ensure that the balance between them supports the LBG's objectives. These features can be mixed in the design of an LBG. Depending on how they are mixed, vastly different games will emerge. Addressing the boundaries and dimensions can be used as a tool to create new kinds of dynamics that can be combined to form new

Figure 58: Boundaries of LBGs - model outline

types of game-play (I elaborate further on these dynamics in Chapter 7). The purpose of creating the Figure 58 Boundaries of LBGs (cf., p. 78 and 173) is to serve as a tool to remember the different dimensions and their relation when designing LBGs. This is to avoid creating LBGs that merely spice up an otherwise virtual experience (Waern et al., 2009). In addition, the model can be turned into a tool for describing LBGs. In Figure 59 below, a scale that determines to which degree the features of the six dimensions are used is added. A five on the scale is equivalent to a very high presence of the features in one of the six dimensions. A one is equivalent to very low presence. It is not a normative scale, which means that it is *not* a matter of the more, the better.

Figure 59: Tool for describing LBGs.

Throughout the chapter, questions related to each of the six dimensions have been put forth. The questions are collected in Table 6 (in the Appendix, page 292). The goal of the questions is to assess to what extent each dimension is used and balanced in the LBG design.

Visions of Sara and *Foursquare* are very different LBGs, and thus answering the questions about these two LBGs should show how they relate to the boundaries in different ways. The model is used to make a *brief* analysis of these two LBGs, which is depicted in a web similar to Figure 59. Let's see how the two LBGs relate to the boundaries and the six dimensions:

Visions of Sara comes across as a game. It is limited in time and has points. However, rules are unclear and although play space is limited in design, it is not experienced as such. It is not quite clear to field agents where to interact with the game and whether non-players can be involved in the game. The game is situated in town and at the library, both of which have multiple uses. *Visions of Sara* seeks to motivate players through telling a story but also through awarding points and imposing a time restraint. The game is mostly about adventurous discovery, but players must keep moving, too. Consequently, in terms of the dimensions, *play* and *ordinary* are at a medium level. *Foursquare*, on the other hand, is not limited in time, space, or social setting. Players gain points and compete over mayorships, which are linked to progress. This is done in space framed as ordinary but in a discrete way. Players appropriate space either to gain points, connect socially, or to discover interesting

locations. The game's actions are linked to everyday actions. Play is lower. Ordinary is very high.

Visions of Sara tells a story to the players. Navigating this *fiction* is at the core of the game-play. The game also uses the story to guide players to a certain extent. Fiction is assessed to be very high in this game. *Foursquare*, on the other hand, uses a loosely contrived theme that allows for establishing mayorships and check-ins to guide the players in their tasks. Still, players can use the game as a tool for telling a story about themselves. However, the use of fiction in *Foursquare* is very low. *Visions of Sara* involves *authentic content* in the game, as historic information and objects intrinsic to the environment are used to some extent in the game. For instance, statues are connected to the story of the game, and thus the significance of the statue changes, and players must use the library system to find a book. The use of authentic content is medium. *Foursquare* is based on actual visits to actual places and real relationships between players. This authentic content is central to the game and thus the use of authenticity is very high.

Visions of Sara uses *physical space* as a setting in the game to enhance the story, and it makes use of spatial properties of particular locations to stimulate the field agents' senses. Field agents must move between specific locations during the game, navigating in physical space. The tasks are based on these locations and the player's interaction with and exploration of them. This is assessed as a very high use of physical space, but since it only occurs for half the game, it is rated medium. *Foursquare* requires players to move around in physical space to check-in at venues. The game is not designed to stimulate the senses of the player. The interaction with location that the game encourages is to create, add tips about, and take photos of locations. However, the level of players' interaction with physical locations is very low throughout the game. In *Visions of Sara*, players have access to new perspectives, as information about locations is distributed into the environment. Players are divided into two positions. For base agents, technology and thus *digital space* requires considerable attention. Base agents must watch for flags and the position of the field agent while attending to which tasks need solving and to the state of the game. Field agents cannot sense the geo-zones, and thus their attention is not on technology but rather on their surroundings and the instructions from the base agent. Players spend half the time in each position, which places *Visions of Sara* in between full attention on physical space and attention on digital media. The game cannot be played without information from either digital sources or the physical

environment. The use of digital space is both very high and low, depending on the position of the player. I assess the role of digital media as being medium in total. *Foursquare* is played on-screen. Although players must move around in the game, most of the action happens in digital space. The reach of players is expanded and they can add information to the real-world venues through the game. Since there are many players, this expands their reach substantially. The use of digital space is very high.

The categorization results in this "score." Note that these are assessments:

		Visions of Sara	Foursquare
Meaning/Motivation	**Play**	3	2
	Ordinary	3	5
Frame	**Authenticity**	3	5
	Fiction	4	1
Media	**Physical**	3	1
	Digital	3	5

Table 3: The result of the analysis shows the two LBGs' "scores."

Illustrated in the graph below, we obtain an idea of the difference between the design of the boundaries and the dimensions in these two games:
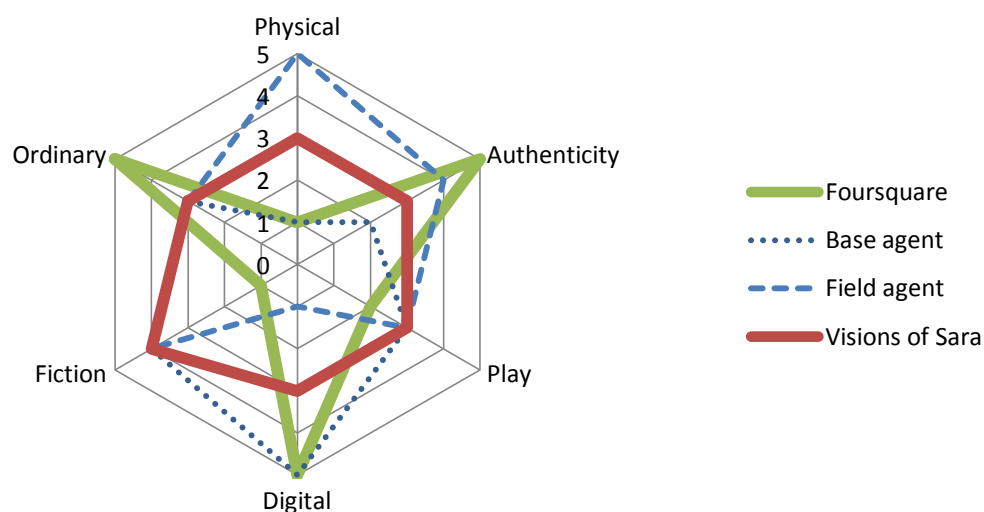
Figure 60: Tool for describing LBGs with *Visions of Sara* and *Foursquare* as examples.

Visions of Sara looks different if separate graphs for base agents and field agents are made (see, respectively, the dotted and stippled lines in Figure 60. This figure shows that *Visions of Sara* is trying to involve all of the dimensions to some degree. The chart also shows that the two LBGs use the six dimensions in very different ways, and which dimensions are prominent. The activity of going through the various dimensions can be used by designers to see development potential. For instance, *Visions of Sara* could be tweaked toward being

more about play by leaving out points and time restrictions, or provide players with more authentic challenges and increase ambiguity. It can also be used as a model for analyzing the LBGs. For a game to be location-based, physicality, authenticity, and the ordinary should always be involved in the game-play to an extent. LBGs play with these dimensions, letting one pervade the other: Fiction merges with authenticity, digital code blends into the physical world, and play with everyday life.

Conclusively, the Boundaries of LBGs (See Figure 23), the questions related to these boundaries and dimensions (Table 6) and depicting the assessment of use (Figure 60) can be used:

1. As tools when creating LBGs
2. As inspirational devices for using the different dimensions in LBGs
3. As tools for conceptualizing and analyzing LBGs in relation to spatiality and play

We have now covered the six dimensions in the model Boundaries of LBGs. These dimensions are used in LBG design. It is not only the LBG, however, that pervades the physical environment but also the player who pervades his/her environment through playing and making sense of the locations. This pervasion involves the player's body as well as imagination and skills. Let us next turn our focus toward the tactical practices, i.e., the player's performance and experience. In the next chapter, the LBG player experience is analyzed.

7   The Location-based Game Player Experience
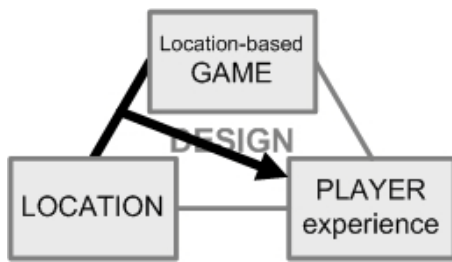
In this chapter, focus is on how the player creates the LBG player experience, i.e., tactical practices. This chapter relates to how the relationship between location and the LBG affects the experiences players can create with an LBG. The arrow in the illustration represents this blending.

In this chapter, the argument that the player is not just a consumer; he/she is a creator in the game is expanded. The player produces meaning in the context of the environment, the rules, the objectives, and the story. Further, the player enters a play situation with the knowledge and skills that he/she has available and can utilize. However, there are more "players" on the scene: The LBG makes opportunities relevant and renders others irrelevant. The player can use it as a tool to create meaning and thus an experience, one of pleasurable arousal. The LBG provides the player with a direction and a focus of attention. The active environment (locations) pushes and pulls the player, affecting the player's experience and perception. The stage is crowded by these three entities: the active environment (locations), the LBG as a tool, and the productive player. Together, the players' use of LBGs leads to new perspectives and movements in space.

The first part of the chapter analyzes how *the active environment* affects the player's mood and consequently the LBG experience. The second part relates to *the LBG as a tool* through which the player can create meaning as it offers meaningful actions, i.e., actions that have relevance within the frame of the LBG including helping players to reach their goals, which are related to the context, and which help players pursuit a pleasurable state of arousal (cf. Chapter 3, p.104). The LBG does this through its rules that often need to be negotiated by players, and are not unambiguous as suggested by Salen and Zimmerman (2004). The LBG affects how players act while playing. The third part of the chapter relates to *the productive player* who has skills, knowledge, and intentions that s/he uses to create meaning and places through movement, and in doing so, gains new perspectives on spatial locations. Finally, a *conclusion* on the conditions for creating an LBG player experience is drawn.

7.1　The Active Environment

The player is physically present in the LBG. This means that circumstances in the physical environment that can be perceived physically will affect the LBG experience (Nova & Girardin, 2009). This encompasses such concepts as weather conditions, aromas and odors, steep hills, distances that are exhausting, in short, the materiality of environmental elements (cf. Section 6.3). All are experiential aspects that can be felt and sensed through the body (Lamm, 2002) and that affect players' sensuous involvement, which is a distinctive feature for LBGs compared with traditional media, e.g., television, other digital games, or books. The environment in LBGs calls for and affects the player's attention. Merleau-Ponty (2002) describes the relationship between person and space as interactive: We are in continuous communication with the world. The player perceives, senses, and acts in and upon the world, but the world affects the player as well. It is a two-way relationship. In this section, the environment's influence on players in the LBGs observed or played is analyzed.

When playing LBGs, players relate to the environment and weave it into their experience. Thus, when a group of players in *Land of Possibilities?*, which is played at a museum, begin the game at the house of the cobbler in which their character, Jens, is raised in the story, the boys note that they live in a "wee, crappy farm." [LoP?, 8th grade, 1] They seem disappointed, as they had previously thought Jens lived in a big farm they had found just beforehand. The players participate with their mood, commenting to each other on the physical circumstances and thus sharing the atmosphere of the place. In this case, and with the girls playing Karen who want to get away from home due to the smell at the poorhouse, the players can link this circumstance in a meaningful way to their game experience because of the story. They use the fiction and game objective to frame the size of and smell in the house, to give it meaning in the LBG, as it underscores objective and story, and thus adds to the meaningful whole. These groups experience the size and smell as being within the boundaries of play. The LBG provides a frame to create meaning with (Gordon, 2009). However, the players made these observations at the very beginning of the game, meaning that they still had not learned the premise and the boundaries of the game. Thus, we see players are prepared to connect the locations with the LBG right from the start, even before knowing their tools, i.e., the LBG's affordances.

In the observations above, the physical environment is a stage on which the players can act out the narrative of *Land of Possibilities?* However, the fiction can also be used to *expand* the

location. This is observed in *Land of Possibilities?* when a group of players comes across an NPC who is having a social gathering in a garden: The NPC was "met" in the garden: The group listened to the NPC talking, but they also heard the sound of people who were socializing and, by the sound of it, having fun. The weather was nice, and it seemed probable that people could be having fun in the garden. This is a natural coincidence in Reid's terms (Reid, 2008). This created a sense of people actually being there. The garden came alive. The story unfolded at the location, as if actions were actually taking place. Story and place fit nicely together (Kristiansen, 2009), augmenting each other, aided by the weather conditions. The experiential aspect of the location affects the player. The sounds, the sun, the garden with the old fruit trees, the traditional house, they all affect the mood, and, players can imagine the social gathering in the garden. The player, spurred on by the sound clip, makes the link between garden and game through his/her imagination. Here, the relation between LBG and environment affects the "space of moods," as described by Böhme (2007), or affective involvement in Calleja's terms (Calleja, 2007), as well as sensuous involvement. The location affects the player's mood and the player participates in this mood with his or her body.

The player must be in a certain state of mind to link the size of the house, or the smell to the story, or to imagine the party in the garden: motivated players are intentionally aiming for a playful experience. In this case, the player can get excited by an immersive dynamic: The attention of the player is led toward an otherness, and the perceptual apparatus is affected (Murray, 1998). The LBG player can tune into the location and appropriate it immersively (Jansson, 2006).

Figure 61: the Franciscan monastery, *Gråbødre Kloster*, is an atmospheric location that players pass (Photo from VisitDenmark, Odense).

Spy in the City, *Land of Possibilities?,* and *Visions of Sara* are staged in, and based on specific locations. When playing site-specific LBGs, players can tune into the fit between story, game-play, and location. Players of *Visions of Sara* stressed that, although they could imagine that the LBG could be moved with adjustments, it fit very well within the physical environment of

Odense. Vitus, in particular, emphasized that the game had a "convent vibe." [VoS, FI, P3, 1] Several places, such as the convent garden and the monastery in the game led him toward a "convent universe," referring to the Middle Ages and convent life. He said that at a certain point in the story, he arrived at a location called "*Klostertorvet*" ("Convent Square"), and that he felt that now he was "getting warmer," [VoS, FI, P3, 2] i.e., he was getting close to the right location. Players pay attention not only to the points awarded and information presented in the game, but also to the environment, which is used to provide not only a mood but also, in *Visions of Sara*, to indicate in-game performance. This can only be done when the LBG game-play is closely linked to locations, as is the case with *Visions of Sara*. Vitus paid attention to the metaphorical aspect of the path (Lamm, 2002), along which the LBG leads him through an alleyway, past the monastery, etc. The player becomes involved in and appropriates locations in a tactical and immersive way playing the LBG. In this case, locations and their sequence are experienced as intentionally chosen and the player ascribes meaning to these choices within the game's frame. Players also use the LBG framework to focus on the locations that do give meaning in the game and leave out some of the locations on which the path leads them, e.g., through the shopping street and the parking lot.

In the four observations above, players are attuned to the environment: they feel it and connect it to the LBG – both story and game-play. They relate to its physical properties and authentic content. However, locations can also be used intentionally as a medium to represent something, and players are then translating the meaning of the game onto the physical location – they are interfacing with it. It has been described how in *Visions of Sara* Antoinette's lover, Carl, is found as a statue on a building and how it makes the player Jens experience coherence in the game (cf., p. 196). The office with the blinds in *Spy in the City* seems like an "authentic" representation: Following directions, the building is found, along with the window and the blinds. When we played, the blinds were up and we entered the answer into our device. We suspected that the device and underlying system would not "know" if our answer was correct. However, as a brief video appeared on our screens displaying our "contact" at the headquarters who proclaimed that the fact that the blinds were up was a signal of increased danger, it worked. Regardless of what state the blinds were in, the contact would have told us that this was a sign of danger. However, their state was independent of the game and thus the story suddenly seemed real and believable (cf. Section 6.2). This was especially meaningful, because the blinds are dynamic elements staged by the

designer. The blinds are not just there, they are doing something in the situation. It was a near perfect representation of the situation (Waern et al., 2009).

Players use locations to connect meaningfully to the LBG and thereby create an experience. Thus, locations are not merely material that can be used in the game. Although they are a medium used for representing something (else), there is also more than this representation aspect. Locations can actively affect the player's mood, a process often initiated by the design, afterward moving out of the designer's control.

Hayles (2004) has argued that code has the unique capability of hiding and revealing content in relation to the situation. Physical locations can also hide or reveal aspects that make them suitable for exploration. It is not the designer who controls, but rather the player who explores and discovers the hidden element. Exploring locations is a prominent feature in many LBGs (Benford et al., 2006; de Souza e Silva & Sutko, 2009), although as we saw in Chapter 2, not all LBGs have game-play that revolves around exploration. Exploration can be a particularly thrilling experience, according to the players. This thrill was observed first hand when play-testing *Visions of Sara*. This is an account of play: Elsebeth is the field agent, and I am the base agent. She is at the town square in the center of Odense. "I don't get it, read the poem again, please," [VoS, test, P1, 2] Elsebeth says into the phone. She is trying to find a clue. I read the poem aloud one more time; it is about a "blind lamb" with a sword. It is something for which "Sara" is looking. Finally, the field agent, Elsebeth, says, "Now, I just learned something new about my own town," [VoS, test, P1, 3] because she has found the statue of Justitia, the Roman goddess of justice, high up on the roof of Odense's city hall. "She is looking for justice," [VoS, test, P1, 4] she tells me. Afterwards, Elsebeth emphasizes this was the best moment in the game, as the LBG revealed something to her that she had never seen before, even although she has lived in Odense for years. The location is playing a part in its hiding an immense statue for us in plain sight. However, we do not have to move far from our habitual perception to find something that may bring a fresh perspective forward: A task in *Visions of Sara* is to find the age of the woman who haunts Sara by subtracting the age of two kings. The field agents can find two statues centrally placed in a well-visited park depicting each of the kings. The field agent has to find the year of birth and death for the kings, so that the team can calculate their age. This was a favorite task for one of the players, Lasse, as it demanded calculation and that he "[…] had to find the numbers on statues that you normally just pass." [VoS, E-mail, P2, 2] The LBG guides the players'

attention to an element at the location and introduces a new perspective, in this case, at a known location.

Playing *Fruit Farmer,* I experienced that the physical space can directly affect the players' experience in a bodily way – in this case, by physical space being put in brackets or hidden as physical

Figure 62: A base agent at the statue of a King, discussing a puzzle in *Visions of Sara* with her partner.

and digital spaces are experienced as a hybrid space. I was running around between the buildings of the university, my gaze fixed on the screen. I was trying to figure out the scale of the map on the screen and the direction. I moved toward the location of some digital fruit. Then suddenly a digital killer wasp on the screen flew right at the representation of me. I started running in the direction I thought would be away from the wasp. I did escape the wasps, in the digital world, only to run directly into some bushes with thorns, tearing my bare arms in the physical world. In this LBG, the physical world is part of the maze and game-space, although the players' attention is pulled away from the physical space and toward digital space, or rather to the correlation between physical and digital space. Although attention is actually pulled away from physical space, the player continues to interact with it. In this way, this LBG plays with the dichotomy between digital and physical spaces.

Conclusively, this analysis of the physical environment's role in LBGs has shown that the player is physically present in LBGs and is in a continuous interaction with the world, meaning that locations affect the player's bodily experience and thus plays a role in an LBG. Seeing how the physical environment affects players is relevant in relation to understanding how LBG experiences are created, because it shows that A) the player is connecting the LBG to locations, B) the LBG can use the environment as a medium and guide the player's attention to certain details or use it as a stage, and C) the environment is doing something itself; it affects our bodily experience, i.e., our perception.

The environment is playing an active part. The player experiences it and interacts with it through the LBG. The LBG directs both the interaction and the player's attention. Thus, it can be used by the player to create meaningful experiences.

7.2 The Location-based Game as a Tool

Through actions we, and thus players, create meaning (Csikszentmihalyi, 1991; de Certeau, 1988; Merleau-Ponty, 2002). When we act, we express intentions, and if there is harmony between these, the performance meaning emerges (Merleau-Ponty, 2002). The LBG gives the player a goal at which to aim, as well as the means to reach the goal, along with feedback on the state of progress (cf. Section 3.2). The LBG directs the attention of the player through rules, a narrative, use of locations, and the goal. In this way, the LBG can guide the player's attention and actions in everyday spaces into patterns that can result in a pleasurable experience on the boundary between play and ordinary (cf. Section 6.1).

Games in general limit the possibilities or indicate those that are relevant for creating arousal and reaching the goal. In this way, games are tools that players can use to create play (Arvidsson & Sandvik, 2007; Jessen & Lund, 2009; Walz, 2010). However, LBGs often have ambiguous rules, as the limitations and affordances of the game are not clear and thus the scope of possibilities can be unclear too. As shown by the analysis in Section 6.1, it is not always possible for players to answer: Who is part of the game, what can I do, where is the game, and when is it played? LBGs allow players to perform a wide variety of actions in the physical world to play the game. As we shall see, figuring out which possibilities are available and which of these are relevant and playing in ordinary spaces makes LBGs a distinctive tool for creating different types of experiences.

In the first part of this section, I discuss how possibilities are made available to players and how players experience the *regulation and constitution of actions* in LBGs. Next, I examine how *actions and attention guided are in LBGs*. Finally, I discuss *new perspectives and movements* that LBGs enable.

7.2.1 Regulating and Constituting Actions

Playing a game is all about performing actions, and thus, the way the game reveals which possibilities are allowed, and which are rewarded in the game is crucial. The rules provide this information. In LBGs however, it is not so straightforward, for not all of the rules are governed by the system or they are not explicitly conveyed. In this relation, we have discussed two kinds of rules in LBGs: constitutive rules that make activities *possible* and cause players to do things, and regulative rules that legalize activities and *regulate* what players might

do (Walther, 2007a). Let us look at how these rules are governed, through an analysis of observations from the LBGs and of the players' responses.

Players carry out actions in LBGs in the physical environment, as well as through devices, which means that the system cannot regulate all of the available actions. Thus, *Fruit Farmer* and *Ghost Patrol* constitute the action of racing in physical space for digital objects that are awarded and fleeing in physical space from digital wasps. However, there is ambiguity about regulating this play activity, especially in relation to how to act toward other players. For instance, is it acceptable to push opponents away? No rules regulate such activity, and the game system does not "know" if somebody is being pushed. *Land of Possibilities?* constitutes moving around looking for NPCs who can help the character going to the United States. However, players do not know for not sure if other actions count, e.g., talking to the interface. Players regulate their own actions in relation to sharing information with the other groups about the places they visit. In this relation, the groups individually make up regulative rules, as they play. Here, the discussion was not only whether they were allowed to, but also if it was sensible to help the opponents. *Foursquare* constitutes creating and checking into venues. It is made clear to players that they are "cheating" if they try to check-in to venues at which they are not physically present. *Foursquare* has chosen *not* to make strict regulations of check-ins. Due to this platform's openness, players in *Foursquare* can cheat by checking in to venues far from their physical location.[23] Conversely, the location-based service *GoWalla* – similar to *Foursquare,* but without the ludic aspect, i.e., progress-oriented features (high scores and points) – tries to regulate this behavior by shrinking the zones used for checking in. This means that players sometimes cannot check-in to a venue, although it is where they are in body, because they are not exactly in the somewhat smallish geo-zone that they cannot see is, which obviously can result in player annoyance. This conflict between system control and player self-control is relevant in LBGs, as actions outside of the system – in the physical world – are not monitored by the LBG system.

Visions of Sara constitutes that the base agents find and explores locations, and that field agents search for information to answer questions. It regulates the amount of time spent. However, some of the search activities do not happen through the game interface, but rather in the physical world, and players regulate this activity themselves. The players describe the

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[23] I have succeeded in checking in at venues more than 150 km from where I was at the moment.

situation as ambiguous whether they are allowed to use an online search engine when searching for information, to go to the library, or to ask passersby for help. Also the constitutive rules are not clear, which was observed, e.g., in the "library task" in which players had to figure out that it was *possible* for the base agent to leave the base and go to the library to look for a book about which they have gathered information via several tasks.

Figure 63: The field agent can find a sentence on the school building.

Some of the players in *Visions of Sara* were confused by these loosely defined limitations and affordances, while others quickly adapted to the process. Although it was confusing, players also liked this "surprising" element. Vitus stated that he liked that they had to take a risk and think "outside of the box." His partner Esther agreed and suggested that it is a special feature of the game that players must think creatively about how they can solve tasks. As an example, she mentioned a task at the Cathedral School in which players were supposed to find a Latin phrase and use it as a search word in an Internet search engine. She said, "It might be feature [of the game] that people believe they are violating the rules and then 'Google'[24] secretly and have a blast from it. That is also quite fine." [VoS, FI, P3, 3]

Esther's utterance shows that using a search engine can be seen as cheating, i.e., outside of the rules. Maybe this is why, having observed *Visions of Sara* being played several times, as well as the *DJEEO Education* games, I see the majority of players are reluctant about using resources outside of the game platform. Players from *Visions of Sara* expressed that they felt they were "cheating" when they used search engines and other resources at first. Through playing the game, they learned that using these resources was within the frame of the game. Without discussing it directly between the groups, often the base agents signal to the other groups that they use search engines by saying aloud that they think it is okay to "Google" things during the game (this was observed both in the different *Visions of Sara* game sessions and in *DJEEO Education* games). Most players are actually *not* trying to violate the rules and thus they are often hesitant about using, e.g., perform an online search at first, which is

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[24] That is to conduct an online search, using a search engine.

perhaps because they consider this cheating. With *DJEEO Education*, it was particularly observed how players try to hide that they are using the browser, quickly shifting away from it when teachers or opponents approach. Vitus argued that most players do not want to cheat, because "the satisfaction of solving a task is probably only present when one feels that one has solved it within the rules – within the frames set." [VoS, FI, P3, 4]

Cheating is a shortcut that takes away the challenge and the equal terms. The players who are reluctant about cheating are playing the game to play (Juul, 2008) with a paratelic mindset as they enjoy the process (Apter, 1991). They have a lusory attitude, which means that they want to accept the rules of the game (Salen & Zimmerman, 2004). However, it can be hard to accept rules that are not clear, which makes the topic of cheating particularly relevant in relation to LBGs. As mentioned, players often handle this ambiguity by negotiating the rules among themselves. In this way, players indirectly negotiate the boundary of what is and is not accepted in the game.

Players are often uncertain regarding what they are allowed to do and what is possible in the LBGs. Not only the regulative but sometimes even the constitutive rules are ambiguous in LBGs, and this contradicts that rules are unambiguous in games, as stated by Salen and Zimmermann (2004) (cf. Section 3.2.1). Players are challenged to regulate their actions themselves and figure out what is possible in the LBG. Still, LBGs set goals and this constitutes the value of actions. The negotiation and exploration of actions is done socially in negotiation between players. They set the boundary between which actions are accepted and which are not.

That the rules are not governed entirely by the LBG can cause ambiguity, which can be used to increase player involvement in LBGs (Benford et al., 2003; Benford et al., 2006; Gaver et al., 2003). However, it is not necessarily good if the players feel that they are cheating or merely overlooking possibilities, because they did not know they were available. This can be the result, if the interface is unfamiliar and the regulative rules are self-governed. The possibilities are perhaps infinite, but not everything is relevant, and the LBG should provide a frame that players can use to determine which to choose (Bateson, 2000). Thus, the LBG should to some extent show players what is possible and relevant through the feedback, e.g., fiction, points, use of representations, and instructions. This actually strengthens the constitutive rules. In this way, some ambiguity is preserved *while* ensuring that players have a

sense of means toward their goal. Having the sense of their means is pivotal for players to stay motivated and able to experience pleasure (Apter, 1989). The next section examines how players can be guided in LBGs.

7.2.2 Guiding Players' Actions and Attention

Through feedback, players learn which possibilities are allowed and which are relevant in relation to the objective in the LBG. When designers constitute values of actions in LBGs, they need consider what these values make players focus at and how they make players act. Assigning values to different actions in the same LBG can make the actions either support or conflict with each other.

Using points is one way to provide a guideline, as they show what counts in the game and thus constitute actions. The points suggest that there is a "correct" way to play the game. Related to this, the player Vitus argued that

> As a player, you still cannot completely avoid focusing on points. The simple fact that there are points makes you feel it is a guiding principle [Tora: "Mmmm" and nods. She seems to be in agreement]. Both because probably everybody has a competitive side, but also because when you play a game, then you really like to play the game correctly.
>
> I do not know whom it is we want to satisfy, whether it is the other players, or those who have made the game, or just the game itself. But we always strive to play the game correctly, and if there are points assigned to the game, then the right way to play the game, must of course be to do what actually gives some "good points." And if it suddenly gives really "good points" to get home quickly, then that part of the game will carry weight, and I think one will make a beeline for that. [VoS, FI, P3, 5]

In this statement, Vitus observes that the points are actually *pointing* to a "correct behavior," and that he thinks players will set their target for this behavior. In other words, the points are constitutive. His arguments and the players' actual actions correspond: Although some players claimed that they prefer to linger on details and solve puzzles over and above competing in regards to speed and struggling with the time frame, none of them chose to take it easy if they fell behind and spend more time at what several of them said they found more pleasurable. They obeyed the constitutive rules related to the time allotted for play.

This does not necessarily mean that they were enjoying themselves. Using points did to some degree pull players' attention away from story and exploration, and toward achievement and action. It enhanced the game-mode above play-mode (Walther, 2007c).

Regulating the activity through a time restraint can also induce game-mode. Time is a numeric value that can be used to compare progress similar to points, and it is used by some players when they create a strategy in *Visions of Sara*. This was observed with Jens and Tora's actions in *Visions of Sara*. Tora complained that when she was field agent, she did not know how much time they had for finding the locations, which frustrated her. After the first half of play, her team was behind, and the other teams had found more locations than her team. This made them change strategy and they hurried more in the second half. Jens, who was field agent in the second half, even returned to the base ahead of the deadline after he had visited all locations. This caused them to spend less time solving the tasks, which Tora did not like. She said she felt that they were "compromising with their solutions," [VoS, FI, P3, 6] because they had to hurry through the game and that it was less satisfactory to her. This indicates that Tora was more inclined to explore locations than to advance through space, which on the other hand, Jens said he liked. Jens and Tora choose play the second half of the game in a game-mode. Note that not all teams chose this strategy. Vitus and Esther, seemed to both prefer the play-mode, since they prioritized activities differently and focused on exploration and solving tasks, and their strategy worked as they both said they enjoyed playing the game.

Some players play for points (Juul, 2008). This is observed with a group of 8th grade players playing *DJEEO Education*. There were two teams, and one of them, "Team Superman," was clearly ahead of the other. One of the team members of "Team Superman" asked his partner on the phone, "How many points do we get?" He listened to his teammate answering the question, and then he stated, "Do it, we have the time." [D.E., SM, 1] The player assessed whether the task was worth solving not in terms of enjoying the process of doing this, but in relation to the progress they can make. The team retained their lead and decided to check-in at the base 16 minutes before time was up without solving the last tasks, as the other team did not have a chance to catch up to them. This observation indicates that this team was not solving tasks, because it was entertaining in itself; instead, they were solving them to win. They were in a game-mode focused on advancement above exploration (Walther, 2007c). In addition, they were very focused on a social dynamic of the game: The competition.

Awarding points for certain actions make players prioritize them in relation to the goal of the game rather than the process. The players consider which actions are relevant in order to get points and ultimately win the game. Such a consideration often directs the players in what to do and was observed in *Land of Possibilities?, Visions of Sara*, and *DJEEO Education*. In *Visions of Sara*, it was especially apparent in relation to the task that requires the base agent to go to the library. In the first phases, solving the task correctly would award the players only 40 points. Players in phase two underscored that the task was too demanding in relation to the amount of points. The player Anders noted:

> Tasks can be challenging and demand a lot from the players, but the example in which one of the base agents has to go to the library was perhaps a little too demanding. First of all, because we did not know it could happen and second, because it is somewhat time-consuming in proportion to the limited time we have for all tasks and especially when the reward was not accordingly. [VoS, E-mail, P2, 3]

Anders observed that the means are not clear, and the amount of points rewarded is not appropriate according to the effort the task takes. The way he expressed it, this seemed to cause displeasure and thus the player suggested providing players with a better overview regarding the points for each task, as the points were not explicit during this phase. In the following phase, more hints were given in relation to solving the task, thus lowering ambiguity, and by writing out the points for each task and giving 70 points for solving the library task correctly. The better overview of points enables the player to make strategic choices, i.e., to be directed by the game system. Further, the risk and reward is balanced like the example given by Apter of a the tiger in a cage (Apter, 1991) that provide the right amount of excitement within the frame of the game (cf., p. 104).

Awarding more points is but one way of constituting the action. The time restraint could be removed, which would remove the conflict between hurrying through the game versus dwelling on exploration. To enhance this, players can be rewarded with information in relation to the story, and this will guide them toward the next task. *Spy in the City* does this: players receive an instruction on where to go next by deciphering a code as a supplement to points. This motivates players to solve the task correctly, without time pressure and to engage in both the puzzle and the story, beyond receiving points and incurring time

restraints. Removing both points and time restraint promotes the play-mode even more by increasing the possibility of narrative involvement and exploration, as players would be able to focus on these activities.

The game fiction and location can direct the players' attention toward certain elements, too – e.g., as Vitus experiences that it was getting warmer when he approached places that had something to do with convents (cf., p.225). In *Land of Possibilities?*, designers have combined fiction and points to provide a feedback on the action *performed* but also show what actions *are available* and *relevant*. The group playing Karen analyzed not only the amount of points but also the kind of points acquired; they agree they lack points in the category "Money." How can they get more money? They reason that they should get a job. From another group, they learn that Thyra's family is rich, and as mentioned above, they move in the direction of her farm. In doing so, they draw on knowledge from domains other than *Land of Possibilities?* that suggest what they should do to get money. They can do so, because the points are not just an abstract value but also an amount of money, which again is related to the story. The players are able to identify a problem for which they can figure out a solution. In *Ghost Patrol, Fruit Farmer*, and *Foursquare*, players receive points for one kind of action only: eliminating ghosts, gathering fruit, and checking in at venues, respectively. Thus, it is easier for players to know what to do and what they are "good" at doing.

There is a difference between the points given in *Visions of Sara* and *Land of Possibilities*, as the points given in *Visions of Sara* are not linked to the fictional frame. They are less instructive, because they do not constitute specific qualities but are mere abstract values. The players of *Land of Possibilities?* relate to the avatar's amount of money, network, and abilities. If one of these is deficient or somehow lacking, the players will most likely have an idea about which strategy is relevant. In *Visions of Sara*, the players do not know how much from their pool of points has been awarded due to exploring, swiftness, understanding the story, or skills at cooperation. Further, the points in *Visions of Sara* are unrelated to the objective of the game: save Sara by finding the truth. The players do not know if they are supposed to uncover a certain percentage of the clues related to the mystery of who is haunting Sara and why, or if they need to reach a certain conclusion to have solved the game. Aspects of certain strategies can be pushed forward to the players' attention if they are integrated into the reward system. Changing the points in this direction will render them more meaningful as part of the

constitutive rules that guide players. Hence, this is a tool designers can employ when considering the emergent qualities inherent to playing LBGs.

More instructive points could improve *Visions of Sara*. Alternately leaving out points entirely would render the game more balanced, as it would then be more about play-mode, i.e., exploration, discovery, and narrative involvement. From the beginning, I chose to keep the points to study both telic and paratelic motivations, and through the observations, we can see how different players figure out different ways of playing *Visions of Sara* according to their preferences. However, the focus on points and time restraints disturb players who prefer identifying with the story and being explorative. An alternative approach to having points in the game is to "hide the game system," and not award numeric points but rather pieces of information or progress in relation to solving a task. This approach not used in any of the LBGs observed; however, the use of points was less prominent in *Spy in the City*, as players were not competing against anyone. This meant that players can focus on solving tasks and preventing the terrorist attack, and not so much on points awarded.

LBGs are not played in a controlled environment and affordances can thus be ambiguous. The designer can use rewards – constitutive rules – to instruct players and prevent ambiguity that might disturb the experience. Rewards can be given as numeric points, information, snippets of the story, exciting possibilities, or something else that demonstrates progress toward a goal or enhances players' arousal. We have seen that drawing the players' focus toward progress through the use of points comes at a cost: If the LBG is supposed to be about exploration and discovery, and promote play-mode (Walther, 2007c), then using points might disturb the players' experience. The game's frame can be experienced as incoherent, leaving the players feeling that they are missing out on some part of the game – that they are compromising, as Tora said.

The feedback discussed is an indicator of the premise – what to focus on while playing the LBG. Therefore, feedback affects the players' actions and perception while playing. This is relevant in LBGs in which players have many possibilities from which to choose, and it is not clear which ones the game recognizes or when they are competing against others. The purpose of a game is for the player to experience an interesting, challenging event, which requires a balance between these elements. The purpose of an LBG's frame is to lead the players' attention toward certain aspects. This means that they remove attention from other

areas. As indicated above, the different elements can compete for the players' attention, which is the case with time restraints and exploration in *Visions of Sara*.

LBGs' premises result in different play dynamics, i.e., the processes that we focus on when we in play switch forth and back between free movements and relate to the structure (cf., p.103). LBGs offer particular dynamics, which I will present via my analysis in the following sections and in sum at the chapter.

Fruit Farmer purposely draws the players' focus away from physical space, and with its time restraint and hunting of wasps, it quickens the pace of the players' movements that creates a sense of dizziness and disorientation. The players focus their attention on their bodies and are challenged physically through this ***action dynamic***. The LBG frames the location at which they are playing as a mere stage for the players' leisurely appropriation (Jansson, 2006). In *Spy in the City*, players are awarded with a new task and a response from the headquarters as well as points when they have solved a task, and there is no time restraint. By having no time restraint, *Spy in the City* lets players focus on experiencing the story, an ***imaginative dynamic***, and searching locations, an ***explorative dynamic***. Tasks and story are related to locations to some degree; however, a lot of the interaction happens through the device. When the action is directed toward the location, e.g., collecting evidence such as a fingerprint, it is symbolic or iconic at best, and does allowing players to really use the locations. This can make the actions seem like "human cursor design" (Kristiansen, 2009, p. 122), i.e., players are just moving the device around. Exceptions are the tasks involving the blinds, finding clues in the amendment text and statue, and looking out for the mysterious man. *Spy in the City* invite players to engage in locations by imagining the story happening at locations and sometimes even to let players interact with locations. Thus, *Spy in the City* provides a combination of traditional/performative ***appropriation*** regarding space as a stage, and the immersive appropriation of space, in which the player tries to "become one" with the location (Jansson, 2006). The game is played individually or in pairs, which means that there is little emphasis on competition, but also little on cooperation. At the end of the game, players are evaluated on how well they did and if they prevented the catastrophe.

Competition is central in *Foursquare* in which most points are awarded for checking in at new venues, promoting an *explorative* dynamic. If this strategy were promoting a game-mode, leaving players to pay attention to their progress, we would see players installing applications

for automatic check-ins, or cheating by checking in at venues from a distance in order to earn points. However, it appears that they are more inclined to check-in where they are and thus appropriate space in a traditional sense, which means that they play for leisure and social relations (Jansson, 2006). In *Foursquare,* players can transcend their reach in time and space by leaving traces for others to see. This **_transcendence_** dynamic draws players' attention toward their actions, being able to observe them and the influencing on their actions. *Foursquare* has changed the game toward being more about mapping space through explorative discovery by offering an "explore function," allowing players to make to-do lists in relation to tips, and motivating them to write good tips, as the number of them players have on their to-do lists is displayed.

As we have seen, *Visions of Sara* has also been changed to emphasize its premise. This LBG is meant to let players use locations when solving the tasks, to entice their *imagination*, and let them get sensuously involved when moving along the designed paths. It is designed to promote immersive appropriation of space (Jansson, 2006). However, the way the game is framed it can pull the players toward traditional/performative appropriation (Jansson, 2006), as competition, achievement, and speed are valued to some degree. The game now awards the most points for the tasks that demand *exploration*, fewer points for finding flags, and only a small punishment is given for being late. Despite this balancing of the game, time as a factor still had a great impact on the players' actions in the game. The instructor of *Land of Possibilities*? had a similar experience: She said that she had to tell players not to hurry and try to cover the whole area during the game, as many of them were choosing a "racing strategy" [LoP?, 8th grade, 2] and ran through the museum grounds. This racing strategy corresponds to Walther's description of game-mode in relation to spatial appropriation: In game-mode, players are moving and advancing in space, instead of mapping space through adventurous discovery, as the player in play-mode prefers (Walther, 2007c). Because both *Land of Possibilities?* and *Visions of Sara* award points and have a time constraint, these features can enhance game-mode. However, it also depends on the teams playing the game and their preferences.

LBGs are about shared involvement, too: about competition and cooperation. Players express their relation to other people through their actions in space. *Land of Possibilities?*, *Fruit Farmer*, *Spy in the City*, *Visions of Sara*, and *Foursquare* are all multiplayer games where players move in relation to each other and to locations. LBGs can guide interaction with, and

attention toward other players, affording a **_social dynamic_**. Playing *Fruit Farmer*, other players are opponents and together with them, we experience, e.g., the park as the playground. Playing *Visions of Sara*, attention is guided toward both team work and competition. Players within the teams gain a shared experience of Odense through the game. Players of opposing teams provide pressure and a focus on progression.

Several players of *Visions of Sara* agree that time, and the competition between teams on time, have a negative influence on the narrative involvement and ability to linger over the environmental details, i.e., exploration. Some players say/write that this is a drawback, as they "lose" the story or compromise on solving tasks. These are probably players who seek arousal by feeling immersed in the story or players who get excited by exploring the environment. Other players, such as Jens, are less inclined to become immersed into the story; they prefer competition and intensity. The latter group of players emphasizes the importance of a time frame that challenges them and calls for a competitive approach, both of which keep them excited. Although the LBG affects the players' intentionality, players still come to the game with individual preferences that determine what they tend to choose if there is a choice that seems relevant within the frame of the game.

Vitus stated that he would rather win because he had solved the tasks than because he was faster. This shows that Vitus has a sense of his level of arousal and how to raise it using the game. To satisfy Vitus' preference, there should be no time constraint and probably no points. Juul's definition of a game mentions the player's attachment to the outcome of the game: "[…] the player exerts effort in order to influence the outcome, the player feels emotionally attached to the outcome […]" (Juul, 2005, p.36). This means that if a player does not find it interesting to be good at running, but is more interested in being great at solving puzzles, a game that emphasizes running over puzzle solving will not motivate the player. To be motivated is to be aware of one's level of arousal, having a goal, and an idea about the means to reach the goal (Apter, 1989). Each player's current situation and preferences dictate how and to what degree s/he will feel arousal from playing the game. This is the case in *Visions of Sara*: Some of the players in *Visions of Sara* are going for narrative and spatial involvement. They enjoy exploring the environment and solving the game's puzzles, but find it disturbing that there is a time limit, which distracts them from what they want. They are unmotivated pursuing being the fastest player. On the other hand, another group of players emphasized that this time frame is needed to maintain the sense of competition and keep

them on their toes. They found it highly motivating to compete in the trial of speed. *Visions of Sara* offers dynamics for different groups of players, making it possible for them to engage in the game in the ways they prefer, despite its creating conflicts and rewarding explorative and imaginative dynamics over appropriation and action dynamics. Still, the game could be improved making its dynamics more balanced.

The player Anne Marie expressed that playing *Visions of Sara* she did not experience that she was on equal terms with the two other teams consisting of, respectively, high school students and athletic young men. When asked what she had told others about the game after the event she wrote:

> I have said that it was fun, but a little too much running in my opinion, especially when it was against sports talents and young high school students. I think time played too big a role in relation to the tasks. [VoS, E-mail, P2, 4]

She would, like Vitus, have preferred a game that would let her focus her attention on puzzles and the story. Here, too, the difference in skill levels affected her experience of the game in a negative way. She did not have a sense of having the possible means to the end, compared with the competitors. This can cause a shift in motivational modes (Apter, 1991): the woman can become frustrated and focused on the goal and her lack of desire in relation to running rather on the dynamics that she does enjoy: spatial and narrative involvement. This means that to her, in this configuration, *Visions of Sara* lacks something on its way to become a tool for creating a meaningful experience, although she did enjoy the explorative part of the game.

Thus, we see there must be a balance between guidance, dynamics offered, and ambiguity in LBGs. The game's frame can help guide the players. When the frame leads players' attention and actions in one direction, certain possibilities are sure to be eliminated. This affects the motivation of players – for good or bad – and their movement in space. LBGs are tools that can be used for certain kinds of actions, depending on their premises and thus the dynamics they offer. These dynamics must be balanced. Designers need to be aware of what can result if they emphasize progress or process, game-mode or play-mode, and whether these conflict. The challenges in the game also need to be balanced in terms of players' different physical

conditions. As LBGs are set in physical space, LBGs that e.g., impose time limits or require players to climb walls will offer a competitive advantage to those who are more physically fit.

The framing of LBGs influences which actions are or are not valued, i.e., the dynamics afforded, to which elements players pay attention, and they way they meet locations. LBGs are played in physical space, and thus they frame new perspectives and movements in this space.

7.2.3 New Perspectives and Movements

The technologies used for LBGs enable us to experience our environment as well as our own selves from a new perspective, which has an influence on the way we understand both. In addition, LBGs allow us to move about in the physical environment in new ways. In Chapter 3, it was argued that the media used for LBGs affect our experience of the world (de Lange, 2009; de Souza e Silva & Frith, 2010; Diamantaki et al., 2009; Gordon, 2009; Gordon & de Souza e Silva, 2011), in the same manner that media in general affect our experience of place and space (Jansson, 2006; Law & Hetherington, 2000; Manovich, 2006; Massey, 1993; Meyrowitz, 1989, 2005). In this section, this idea is developed through analysis. The focus in this section is on how LBG provide us with new perspectives and give way to new types of movements.

We have grown accustomed to using a mouse for our computers. It offers different input possibilities: movement, speed, click, double-click, scrolling, position, etc. This also applies for the GPS in games, although conventions are not yet as well established for this use. Players can move the position at different tempi, remain at a position, or perform "jumps" between locations by moving fast. Sometimes a divergence, or a seam, occurs between systems, such as the representation of the field agent's position and that same field agent's actual position in *Visions of Sara* that use GPS. This especially becomes an issue if the players are moving fast. In the LBGs studied, none of them makes use of this as an input possibility; however, it is not difficult to imagine an LBG in which players earn extra points for making their position "jump" between two points, creating an effect of running. This could be explained as "beaming themselves" between locations, "jumping," or a way to "hide" in the game. Doing this would be exploiting the seams of technology in the game rather than trying to hide or minimize them (Barkhuus et al., 2005; Chalmers et al., 2005; Chalmers et al., 2003). Through such symbolic actions, players would transcend their own physical abilities, e.g.,

being able to become "invisible" would allow players to become involved in a transcendence dynamic.

The relation between digital and physical spaces affects the movement of LBG players. In *Fruit Farmer* and *Land of Possibilities?*, it was observed that players perform a peculiar "dance" with the device, as they tried to figure out where the "hotspot" was (respectively, "fruit" and blue dots of the NPCs). At one point, walking with the group of girls playing *Land of Possibilities?*, the following incident was observed: One of the girls held the device in her hand, her gaze fixed on the screen. She walked back and forth, stopped, all the while looking intently at the screen. She walked again, circling around a position. The other girls followed her moves, laughing. She noticed and said, "Sorry, folks!" [LoP?, 8th grade, 3] The other girls stood and waited; one said, "You just let us know when you have found it." [LoP?, 8th grade, 4] The girl doing the "dot-finding dance" suddenly squealed with delight, and the other girls hurried over to her. This LBG's limits are implicit and the girl was exploring the boundary between ordinary and play, physical and digital through her movements. Similarly, Chalmers et al. (2003) have observed how players developed a wiggle gesture to signal each other where they were; they ran back and forth in physical space to make it show up the digital representation. The physical person controls his onscreen representation (avatar) by moving in physical space. This means that the player must translate the spatiality of the representation from the actual surroundings. The player has to understand the scale of the representation, and in *Land of Possibilities?* also to relate him- or herself to the surrounding buildings, roads, and other elements of physical space. The player thus relates to the structuring aspect of the two spaces (Lamm, 2002). Experimenting with mapping of the area, such as changing the structure of the map compared with the physical location challenges players to move in new ways, as we have seen with *Fruit Farmer*. Merely having fiction and rules can instruct players toward certain behaviors that influence their movements in their environment, such as when players rush forward or start to explore their surroundings, follow established paths, or create their own.

Except for *Land of Possibilities?*, the other LBGs mentioned here are played out in the city; they are not set in a "concept space" (such as the Open Air Museum), to use de Certeau's term (de Certeau, 1988). Instead, they let the player explore the space that we "write" (create by walking) without noticing it. *Foursquare* points out the appropriation of space and makes a game out of letting the player relate to his/her relation to space – engaging in an

appropriation dynamic. The game actually offers us a view of our presence in town, as if from the outside, and thus letting us transcend our usual perspective. In *Foursquare*, players can neither see the trace between the check-ins, nor can they see their own movements, as is possible in *Land of Possibilities?, Spy in the City,* and *Fruit Farmer.* They can, however, see the latest places that they have visited. Players' attention is guided toward expressing their relation to the environment and appropriating it. They can feel a sense of ownership, as they become mayors and take hold of the locations, and thus they can express location through their actions – provided they are checking in at venues they are physically visiting. Further, there is actual exploration, as players are mapping the world and visiting venues.

All of the LBGs analyzed in this dissertation except *Visions of Sara* provide us with a "reading" perspective of our own "writing" in space, to use de Certeau's terms, as players can move in space and see their movement concurrently. When de Certeau (1988) describes the view from the tower, which allows us to read space, the viewer is seeing movement in the town that he/she is not part of in that viewing moment. The viewer's perspective is locked in a time and space outside of the city (de Certeau, 1988). However, when players engage in the games, they can see where they are, and in *Foursquare*, they can also see the places they have been. The distance between the reading and the writing perspectives can be decreased with LBGs, as players are physically present in space *and* have a "bird's eye view" on it simultaneously via the device. In this way, the LBG enables players to transcend the ordinary perspective on space and their relation to it.

The perspectives used in *Visions of Sara* are twofold: the base agent has a reading perspective on the town of Odense, whereas the field agent's attention is directed toward details and environments in Odense. *Visions of Sara* brings the space to which we are blind into focus; both *Fruit Farmer* and *Ghost Patrol* let the player control his/her movements seeing space from above and being in it at the same time. This is also the case with *Land of Possibilities?, Spy in the City*, and *Visions of Sara*, but in *Fruit Farmer* and *Ghost Patrol*, the division between these two perspectives is at the center of game-play.

Merleau-Ponty (2002) claims that objects have horizons in time and space, and that these are reflected in the point in time and space from which we experience them. In *Vision of Sara*, events that happened in the 16th century are reflected in the present-day Odense. In this way, the game expands the player's reach in time and space, transcending his/her own

position. This could have been done even more clearly had the platform supported leaving images from that time at relevant places. Players would then be able to see how much the scene has changed since then - or a LBG could display how the scene would change in the future if we keep polluting as we do now. With regard to the spatial horizon, players' attention is challenged to experience new perspectives of locations, e.g., looking all the way up to the statue of Justitia on the city hall's roof. The LBGs studied here all play with the possibilities of providing different perspectives on our presence, movement, and surroundings. In *Visions of Sara*, the field agents are encouraged to pay attention to the objects in their surroundings. Base agents, on the other hand, are required to focus on the relationship between the position of the field agent, his/her surroundings, and the flag. In LBGs in which players have a location-aware device with a screen displaying their location, players shift between a bodily presence – being *in* the space – and seeing the space they are in from above – being *of* the space. LBGs can also direct the players' attention toward the space, as players explore the horizons of space and time, as well as when they follow their own and friends' locations in the world.

Players reshape locations by acting out locations and weaving them together. They create the "links" or relations between locations guided by the LBG (cf., p.39). Players of *Visions of Sara* connect the theater, the convent, and the alley in Odense, one of the players even states that the locations he went through had a "convent vibe" (cf., p.225), although they are not actually related. By making paths in the LBG that lead players through locations, they become connected. Some of these locations are infrequently visited, and these spots become a part of the *players'* city; they are places appropriated through play. Through an engineering of paths, LBG designers can break the habits of movement, as is the case in *Visions of Sara* where players for the most part follow a designed path. In *Fruit Farmer*, players are guided by the position of distributed information (fruit and wasps), which leads to a more random kind of acting out of the location in relation to player's habits. However, LBGs do not necessarily break habits. They can also draw attention to a player's desired paths, revealing the movement of this player as s/he tracks other players' actions or physical condition. This is self-monitoring. *Foursquare* enables self-monitoring displaying places that the player has visited (and checked-in to). By using these technologies, a player's reach is extended beyond time and space – personal trajectories are saved and can be observed; they can be shared with others, too, as their tips stay after they have left; they can move in space yet keep a bird-eye view on it; etc. This extension is tied to actual locations, actions, and movements. It can be

used for game-play that enables players to transcend their own reach and abilities, extending these beyond the immediate situation.

Merleau-Ponty (2002) argues that when something becomes a habit, when it is incorporated in our body, then it has an impact on our perception of the world, which ultimately means that it influences our understanding of the world. When we play games, we also incorporate "habits" that affect our involvement in the (game) world. Calleja (2007) argues that through continuous play, players incorporate the game, so that players experience tactical, performative, affective, shared, narrative, or spatial involvement in the game. LBGs are played in the ordinary world, meaning that it is this world in which we are changing our involvement while playing – and sometimes even after the game has finished (McGonigal, 2006). LBGs provide us with new perspectives both on ourselves and when playing a game; the player adapts to the LBG's representation of the world. Through playing, players experience how the game's premise is incorporated and becomes an intuition about space – players are in a hybrid intuitive space (cf., p.110).

The LBG play space is carved out of urban space, so to speak. Everything in the LBG will thus have some relation to urban space. Moving through this space, players are guided by the LBG, but they are also part of a larger system – part of a constant re-creation of the city. Urban spaces, the cities, cannot be regarded as unified spaces, because our cities are not planned concepts that reproduce themselves according to a plan (de Certeau, 1988), places in the city are recreated due to movements of people and entities (Massey, 1993). As the city is constantly recreated by the movement it has layers of meaning inconsistent with one other. As LBGs happen in this lived space players are relating to and part of creating locations too. Both the LBG and locations take form through the players' appropriation. Other notable scholars have argued that players are producers using computer games as tools (Arvidsson & Sandvik, 2007; Jessen & Lund, 2009; Walz, 2010) and that experiences in general require that the person experience something productive (Boswijk et al., 2005). However, in LBGs players are creating the experience, locations and sometimes even spaces. LBG players can relate to both: "strategic practices," that create a structure of space, and "tactical practices" that through movement creates places (Dourish, 2006). Such practices are the vehicles through which we create meaning and situate the practitioner at the center of attention as a producer rather than a consumer. This approach is exploited in *Foursquare* in which players not only create meaning by making choices and moving, they actually make the system's

nodes, creating locations to check-in at, writing tips, commenting on the actions of others, etc. They create space by mapping their surroundings. Players can also create structures within these structures – such as the task at the IT-University (cf., p.186). In this way, *Foursquare* provides a structure that players can use to relate to locations and through which they can create relationships to these locations.

In this fashion not only is the play experience made, but sometimes even locations and spaces by the players themselves are made through their motivated choices and movement in physical space with reference to the context, goal, means and excitement, which makes the activity meaningful. The players of LBGs are creators who are shaping both their experiences, locations and sometimes even space through play.

7.3   The Productive Player

In general, players are productive in games. What is special about LBGs compared with digital games is that players create the link between the LBG and the locations they encounter, which are framed by the ordinary, and possess authentic content and physical properties. Players connect worlds (Copier, 2005), letting their experiences in the ordinary world permeate play. Players play LBGs to experience the level of arousal they seek. It is with this intention players chose to actualize some of the possibilities that the LBG directs their attention toward.

In this section, players' responses to and utterances about their experience of LBGs are analyzed. The observations used in this section are mainly from the LBGs *Land of Possibilities?* and *Visions of Sara*. Specifically, in this section, it is argued that players are productive in LBGs. Through playing the LBG, players act out and appropriate locations and the LBG system, and express relations through their actions.

First, I investigate the threefold role of *intentionality* in LBGs. Second, I describe how players – based on their knowledge, skills, and the intentionality – explicitly perform the story and create places. They are *productive.*

7.3.1　Intentionality

Players bring resources into play, and they want something from the game. Players have a motivation for experiencing a pleasurable level of arousal and when they play in the game, they do it with the intention of achieving this (Apter, 1991). Thus, the player's actions and intentions are expected to be aligned, so that players are performing meaningful actions. Salen and Zimmerman (2004) claim that meaningful play happens when the relation between actions and outcome are discernable and integrated into the game's context. However, this definition falls short, since it does not include the intention of the players. Players should be able to translate their intentions into in-game behavior (Sweetser & Wyeth, 2005), which again corresponds with pursuing a pleasurable arousal and the goal of the game (cf., p. 104). The players are armed with knowledge, skills, and intentionality.

What does it mean to be armed with intentionality? It means that we are always conscious. Consciousness is always consciousness about something. No human word, gesture, or action exists that has no meaning. Consequently, we read intention into actions and objects created by other human beings (Merleau-Ponty, 2002). Thus, players will read an intention into the LBG, since it is produced by somebody. Players are also directed toward what they experience as meaningful (cf. Section 6.1.). Players choose and perform their actions with an intention.

There is intentionality in LBGs in three ways: 1) The player's meta-motivation is directed toward a certain state of arousal, i.e., they play to experience pleasurable arousal (whether being scared, having fun, challenged etc.). 2) The LBG is intended to support certain actions as it directs the player's attention and actions through the narrative, rules, points, and objectives of the game. 3) Players read intentions into the game. Together, this means that the playful player has a lusory attitude (Salen & Zimmerman, 2004), since he/she is motivated to "follow" the game and to figure out toward what goal the game is directing the player. The player can figure that out by participating. Outside of the LBGs frame there is the intentions laid into the environment, its legitimacy, which affects the player as well. However, in this section we will focus on the intentions within the LBG's frame.

To learn about the intention of LBGs players tune in to the objective, rules, and narrative of the LBG and use them as a base from which to act. Players become involved in tactical decisions within the context of the game (Calleja, 2007). These are incorporated through

repetitions of similar tasks. This means that players in *Fruit Farmer* flee from hunting wasps and search for fruit. In *Land of Possibilities?*, the story frames what makes sense for the NPCs to say and do. The story also indicates to the user that playing the role of Jens, who is a poor but charming boy, means starting the game with little money and few skills, but possessed of a good social network. The objective of the LBG indicates that it is meaningful to find people who can help the boy get money and skills. The game builds on an underlying premise that helps the player determine how to act and interpret events in the game. The game points toward which elements the player ought to attend and helps him/her interpret the events and actions within the game's frame (cf. Bateson, 2000).

LBG players show their intentionality and relate to that of the LBG's through their actions. They relate to intentions "behind" the LBG. This is observed with a group of girls playing *Land of Possibilities?* They are looking for a job for poor Karen. Along their way, they meet another group of players who have visited the character Thyra's farm. They know that Thyra comes from a rich family and decide to pay the farm a visit, hoping to get a job there. They find Thyra's father, who refuses to give Karen a steady job, because she is a Mormon. However, he will make an exception today, because they are busy at the farm. Karen can have a job for a day. The sound clip ends with him saying: "If you are not afraid of standing with your hands in cold water down by the creek the whole day, then I think my wife can use you." [LoP?, 8th grade, 5]. The girls want the job, but they do not know how to make the LBG know their choice and thus their intention. One girl has the mobile phone in her hands; the others are standing close to her in order to hear what is being said and have a peek at the screen. The reaction from them when the audio file ends is:

> Girl 1: "We will just do that. Can you say: 'Yes'?"
>
> Girl 2: (holding the phone) says: "Yes!" in a loud voice directed toward the phone. Directed to her teammates, she laughs and says: "No…"
>
> Girl 3: suggests: "Then write: 'choice: Yes'."
>
> Girl 2: says: "With pleasure, yes… Yes!" This also is said in a loud voice directed toward the phone. "Come on, what can we do?"
>
> Girl 3: "I just think 'they' assume we say yes, right. Did we get any money?" [LoP?, 8th grade, 6]

The girls respond in a way that is natural to them: They answer verbally to a question asked. The device does not provide any feedback for their action, which makes them look for alternative options for making their choice. The last remark of the third girl indicates an expectation of an underlying intention on behalf of the game, there is a "*they*" behind the game who "*assume*" an action and she looks for other types of feedback. Walz (2010) has made a similar point about media, stating that we treat media as social actors. We expect the LBG to have an intention and we trust that it does, due to the implicit social contract that actions in game will create meaning if we follow the rules. Sometimes players will even follow the rules of the game when it goes against their being aroused. This is observed with players of *Visions of Sara* who hurried through the game, even when it disturbed their experience in order to avoid penalty points, as mentioned in Section 7.2. They assume that the LBG is made to support a dynamic intended for raising their arousal. Thus, the sensible thing to do is to follow the game's instructions and intention.

The player's interpretation of the intention of the LBG and his/her motivation is not controlled by the game, although the game can guide the player and provide the player with a goal and relevant means to an end, and a premise to interpret the means with. The intention is not necessarily spelled out for the player. Often players learn it by paying attention to the feedback of the game: when rewards are given and when they are "punished," what kind of challenges they meet in the game, the story of the game, how points are easily scored (cf. Section 7.2). Players learn to play the game by playing. In order to solve the first location tasks in *Visions of Sara*, the field agent must find something in the surroundings. As this is repeated in every location task, players expect that this is how all location tasks should be solved. This is the case for two of the players of *Visions of Sara*, Tora and Jens, who are struggling with the most challenging task in the game. Tora is situated at the control center. She reads the task description over the phone:

> Sara sees a nun lying dead with a dried plant ... with a bouquet of dried plants at the chest. Which plants are they? Write the name of the plant with small letters. Hint: Maybe you can find the answer if you follow the name, call number, and page number at the library. It's not for children. [Pause] Is there a library nearby? [Pause] Mmmm, is there a library poster? [Pause] Is there something else? [VoS, O, P3, 1]

The event occurred in the second half of the game. At this point, the players have completed a number of location tasks and expect the field agent to find something in the environment that will help them, because exploration is the overall dynamic on which the game-play of *Visions of Sara* is based. The field agents' exploration of their surroundings refers to a meaningful whole; however, in this particular task, the two players have been encouraged to approach things differently. Tora, the base agent, understands that *the library* is the place to go. Yet this is confusing, for she is at the base, meaning she is already in a library. In fact, she even has a call number 57.1 from a previous task, but unfortunately, the two players have missed that the field agent has information for this task in his folder, too. This instructs the field agent to find a house number at his present location, which indicates a page in the book they are supposed to find. At this page they will find the name of the poison that killed Antoinette. In the text in the folder the field agent also has the name of the author. Because they have missed this information in the folder, however, the team is frustrated in solving the task. Tora could leave her post, still staying in contact with the field agent via phone, visit the shelf to which the call number 57.1 refers, and look for a relevant book as they are instructed to find a book. She knows that it is supposed to tell her which poisonous plant was used as the murder weapon. Yet, Tora said that she did not consider the option of leaving her post, and she was not the only one who reported feeling that way. For instance, some of the players who had played the phase two version (an earlier version, before the wording of the task was changed to instruct more clearly on what to do, an before points were changed) said that they did not think the base agent could leave his or her position by the computer – that it was too great a risk as it takes up a lot of time in relation to the points granted at that stage. Still, in every game observed players were able to crack the code, having gone to the correct section of the library, found the book and learned that Antoinette was poisoned with hemlock. They recounted having enjoyed this challenge of solving all the necessary steps and taking the chance to crack the code in particular.

During *Visions of Sara*, players construct an understanding of what is relevant to do in the game, i.e., what is the intention. They expect that the field agent is supposed to find information in the environment and that the base agent is to guide this activity. What these observations show is that the LBG works to frame and organize the players' attention and expectations (cf. Section 7.2.2). Players incorporate this, so that even when they are instructed directly to do differently it affects their experience of locations and their actions.

When the players have learned to understand the LBG's dynamic and it arouses them, they will want to stay with it. In a task in *Visions of Sara* at a square, the players must figure out what has happened to Antoinette. In the introduction to the task, it is written that the field agents are not supposed to find anything at the square and that the team must figure out the story together. They are given this task at a point in the game when they have all the clues that enable them to answer the question. Still, some of the players[25] are searching for indications of what has happened in their environment. The game has taught the players that they need to search the environment for clues and use them for solving the tasks. However, at this square, no such possibility offers itself. Still, players try to find something there. The task is meant to provoke or inquire about players' incorporation of the LBG's structure, and they did respond. The task at the square is pointed out as "meaningless." Two players even found that this task was the worst. One of them, Lasse, wrote:

> The location task in which we had no idea what we were going to use the square for did not work, because we thought we needed the surroundings, and therefore, it did not make a whole lot of sense. [VoS, E-mail, P2, 5]

For the field agent, the game is about exploring the environment for clues that can help solve the tasks. This understanding has been constituted through *Visions of Sara* and is experienced as meaningful. Therefore, players try to stick to the activity that they like. Finding clues in the surroundings and connecting them to the game is part of the fun. Players go for the dynamics in the game that raise their arousal and thus seem meaningful to them. In *Visions of Sara*, exploration is pointed out as being meaningful. A player, Jens, makes the following observation about his favorite task:

> I think it is good, the one where you should find the name Carl on the "Albani Church," because you reach a location, you have to find a name, and then it is actually there and it is the right one. That's great – to look for something and then get the satisfaction of finding it [Interviewer: To find the answer?] Yes, on something that is out in the town. It is a bit cool and it gives a feeling that it actually holds together pretty well. [VoS, FI, P3, 7]

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[25] This is observed with Jens and Claus. Two of the mail answers indicated this as well.

The story of *Visions of Sara* is directed toward the physical environment. The name of Antoinette's lover Carl is actually found on the façade of the church. This "confirms" the expectations that the players have vis-à-vis the game. Jens is partly describing the task as satisfactory because he solves it correctly, and partly because he sees a connection between the story and the object (the statue). Finding clues in the environment is a meaningful action to the player. In that sense, the game has succeeded in offering a dynamic that can be used intentionally to create a meaningful experience and that makes players be more attentive toward their surroundings.

Understanding the LBG's "intention" helps players to act in it. Meaning is *not* created by the person alone, meaning is created in the interaction between the conscious person and that object or goal toward which that person is directed (Merleau-Ponty, 2002). This means that when the player is going for and directed toward exploration, actions that promote these movements and are within the LBG's frame are meaningful. The intentional player creates this meaning in interaction with the dynamics and the elements toward which the LBG directs the players' attention. The player creates meaning by playing the game.

7.3.2   Creating Meaning (Moods, Stories, and Places)

LBG players develop an expectation and an understanding of the available possibilities and their relevance in the game – what is meaningful. Merleau-Ponty (2002) writes that "to understand" is to experience a harmony between intention and performance that makes it possible to create meaning. In *Visions of Sara*, most players aim at finding clues in the environment, as described above. When there is nothing to find at a location, a player states that the game does not make "a whole lot of sense," it is not meaningful. The field agents in *Visions of Sara* pursue the goal of finding clues in the environment in order to solve tasks and raise their arousal. This seems important to them as they play. Players report they are not just doing this because it is expected, but also because they like it when locations reveal clues to them. When players have learned to play the LBG, if it offers dynamics relevant to them, they can create meaning by playing the game. Thus, meaningful actions increase the player's arousal, are within the game's frame and relevant in the context. However, players can be even more explicitly productive by extending the game's story and creating locations using the LBG, as we shall see in the following analysis.

Players can create connections between the LBG and locations where no link was intended in the game design. By incorporating the premise of the LBG, they can create meaningful connections between game and locations. Two ways that players are explicitly creative have been observed: 1) The first way is to amplify the atmosphere and story deliberately by performing a belief. The players do this knowing that they are taking the story a step further. 2) The second way is to create a link between the LBG, the players' knowledge, and what they encounter. This link might not be intended by the game designer but can be meaningful in the situation. This is what Dansey (2008) has defined as *apophenia*.

The players can amplify locations connecting them to the LBG. This is observed with two boys playing *Land of Possibilities?* who were looking for the home of their character "Jens." It was quite a challenge for them to find the farm. They had a hand drawn map of the area with which to navigate (see Figure 64). Their GPS did not have any connections to the satellites. This meant that players could not see their position on the PDA map and that the map was not updating. At one point, they found a house that could be the right one. However, nothing happened on their device. They double-checked the map, tried to open the doors of the farm, but they were locked so they called out, asking if Jens were there. One of the boys said, "Maybe we should knock first." [LoP?, 8th grade, 7] He then knocked on the door of the farm. He might have expected someone to answer, but no one did. By actually knocking on the door, the player is extending the LBG into physical space. This house could become a *location* in the two boys' game experience, provided that they found it meaningful. They searched the house, interacted with it, and invested it with added meaning.
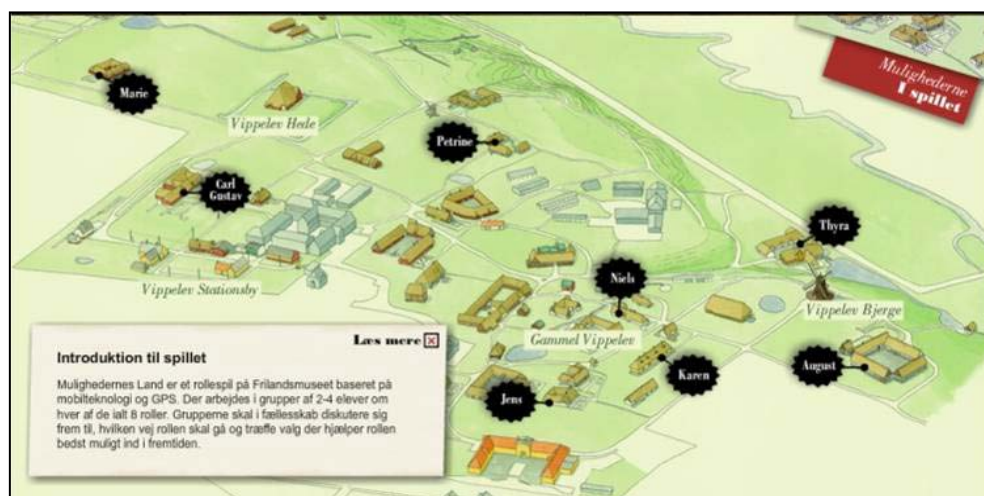

Figure 64: The players in *Land of Possibilities?* have a printed map similar to this one (Frilandsmuseet, 2007)

Players can also draw their knowledge about a location into the game experience and thus extend the LBG into a space for which it had not been intended. This occurred in *Visions of Sara*, as several high school students from the Cathedral School were on their way to the flag at the Cathedral School. Through the introduction, they had learned that Sara's cat had been killed. By coincidence, the nickname of their school is "the cat." The players were eager to use this information, as they had found and created this connection. However, when they tried to use it and it did not help them, they abandoned it. The players connected the world (Copier, 2005), i.e., they connected their knowledge from outside of the play situation to play. This is an example of *apophenia* (Dansey, 2008).

Figure 65: This is the triangle shown in *Visions of Sara*. Some of the players have seen this triangle in the first half, looking for three "lions" of a tringular drama.

Whereas the above-mentioned students did not succeed in creating a connection, the player Claus does. He is a field agent in *Visions of Sara*. His team is solving a route task about the drama in which Antoinette was entangled – which dimensions did it have. Claus has reached the location of a location task. As the question is read by the base agent, Claus searches for clues, although this is a route task that is not location-based. He sees a triangle at a wall close to him. He walks closer to it looking at it. He then turns around and knowingly answers that it was a "love triangle." It is a mere coincidence that Claus can make this connection. However, apparently in his experience there was a fit between his surroundings and the task. As discussed in Chapter 6, in LBGs, there can be an ambiguity related to the expanse of game space. In *Visions of Sara*, e.g., the field agents are facing the city: an environment of multiple layers created by the movement of many with different intentions (de Certeau, 1988; Massey, 1993). Players are not aware of what is and is not part of the game. Players can expect that something in the environment will be a part of the game, and that it is this something they must uncover. Applying the premise of the game to his surroundings, Claus connects these surroundings meaningfully to the task. He frames the triangle in a new way, and thereby it refers to the meaningful whole. He creates a link where none was intended and thus incorporate the ornament into his play experience. Claus interfaces between *Visions of Sara* and the ornament.

Players of LBGs create locations as they engage in the game. In *Foursquare*, this is part of the game, as players set up venues. By setting up a venue, the player tells others that the location has significance, but also displays an intention doing it. Accordingly, a *Foursquare* player has created a location called "Platform 9 ¾" at Kings Cross Station in London. This refers to the *Harry Potter* story universe (Rowling, 1997). In the stories, the young wizards use this platform to travel to their school, Hogwarts; to gain access to the platform, the wizards must run into a wall, through which they then can magically pass. *Foursquare* players have checked into the venue writing such comments as, "You have to run at it hard! No hesitation!"; "If it's

Figure 66: Tips provided by *Foursquare* players at Platform 9 ¾

good enough for Harry Potter, it's good enough for me"; "Just be sure not to run into the wrong wall"; "Careful U might run into a real wall"; or "I came here last week. The steps are as follows: 1: Run at the platform as fast as you can. 2: Enjoy Hogwarts until you wake up from your head injury" (Foursquare, 2010). Obviously, the players are creating this location together using the LBG. Players are turning it into a collectively understood platform for interaction (Gordon, 2009).

Players come into the play situations bringing experiences from other games, using technology and knowledge on which they draw when playing. Players are motivated to reach a certain level of arousal as they go into the LBG. They use the game as a tool to reach this state. Thus, they adjust to the rules and goal of the LBG. In the situation one finds both the player's intentionality and that of the LBG. Players learn the intentions of the LBG through play by attending to the feedback and the consequences of their actions. This structures the player's attention and actions. If the LBG "works" as a tool for the player, then the actions can be meaningful.

Players can amplify locations by acting out the incorporated LBG. They can link the LBG to their surroundings even where no link was intended. They can read their knowledge about a location into the game and thereby deepen play-space. Players can create locations by
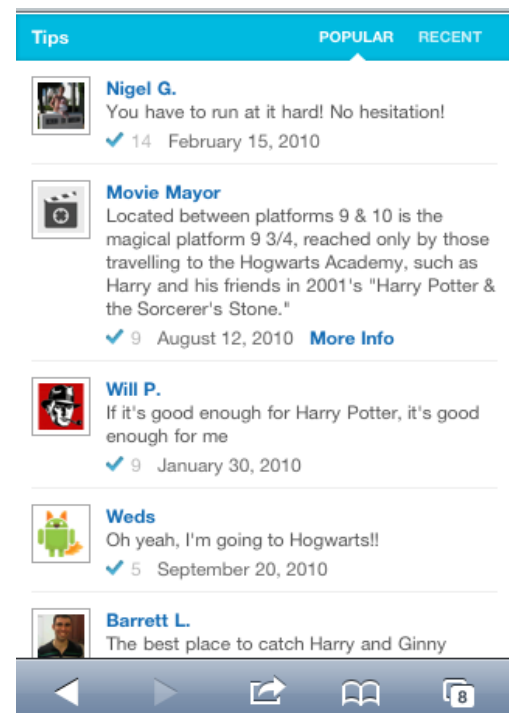
engaging in them through the LBG. Players thus actively create their experiences by playing the LBG.

7.4 The Location-based Game Player Experience: Conclusion

In this chapter, we have seen how the relation between the LBG and locations affects the player's experience. The productive player, the LBG as a tool, and the active environment are all part of the creation of a meaningful whole – the LBG player experience.

The player in an LBG is productive in creating places, acting out the LBG, and connecting it to locations. The LBG provides players with possibilities and guides their attention through rules and a narrative. The environment – locations – is active, pushing and pulling the player. Locations can expand the story of the LBG, and the player can also expand a place using the LBG. Further, players can use the environment to tune in to the game. The environment can be used to represent something, but the LBG can also play on the dichotomy between authentic and fiction or between physical and digital.

The player learns the LBG dynamic – the possibilities, their relevance in relation the LBG and the player's mood – through play. The possibilities are not straightforward and fixed in LBGs, as they happen in physical space. This means that the LBG needs to instruct the player in what he/she can do in the game. Aside from the instruction through the LBG's interface, players can be instructed through the narrative of the LBG, rules, points, or time limits. Rules in games either constitute possibilities or regulate the players' actions. As noted above by one of the players of *Visions of Sara*, it is more satisfactory to solve the tasks within the game's frame. However, players are not blindly following instructions or guidance. The LBG points in a direction; it is indicative but not prescriptive, as directs the players' attention toward possibilities and evokes a mood within them. The players chose according to their own motivations.

Players get aroused through different dynamics. In this chapter, I have analyzed toward which elements LBGs draw the players' attention and which kinds of actions they constitute, i.e., the dynamics of LBGs. Dynamics produce movement and change: When players engage in an LBG, they are motivated to change their level of arousal through participation (movement). The dynamic is enabled through the premise that allows the players to choose

actions and understand events within the game's frame. For instance, "risk and reward" can be described as the dynamic in gambling. The more risk, the greater the arousal if there is a chance of reward. Dynamics relate to the metaphor of a tiger in a cage: excitement within boundaries. Walz (2010) has analyzed how in play entities relate to each other through play rhythm: players relate to their own selves, other players, objects and space. The dynamics found in LBGs through this dissertation make players focus on different entities too. The dynamics described in this Chapter are:

- Action, focus is on *bodily* challenges

- Transcendence, focus is on *extending the reach and abilities of the player*

- Social, focus is on the *relation to others*

- Appropriative, focus is on the *relation to spatial locations*

- Explorative, focus is on *locations*

- Imaginative, focus is on *imaginative world*

These dynamics relate both to play-mode and game-mode, however the balance between being aroused by advancement or discovery varies. Dynamics of action and transcendence are closely related to progress and advancement, and they draw the focus toward the self (sensing me). On the other hand, explorative and imaginative dynamics are more about the process, and they draw the focus toward elements outside of the player (sensing spatial locations). Dynamics of appropriation and sociality are placed in the middle, as they are balanced equally between advancement and discovery. Jansson's three types of appropriation are placed according to the appropriative dynamic, and competitive and cooperative approaches to the social. The dynamics can be combined into different types of game-play, although, as we have seen in this section, this can result in conflicts. The table below provides an overview of these dynamics:
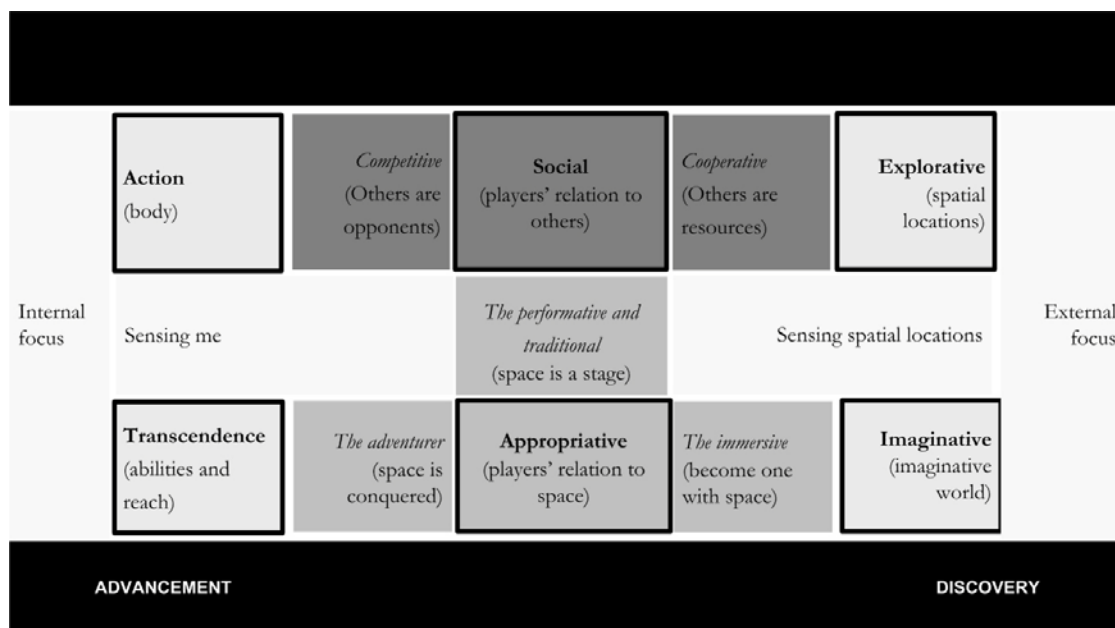
Table 4: Dynamics in LBGs.

In Chapter 2, the relations between the chosen LBGs to locations were discussed. Some allows players to hide and seek information at locations, some let things happen when in close proximity to an entity etc. (cf., p.21). The dynamics in Table 4 do not relate to how players are interacting with the location, but rather what the LBG let the player focus at. Not all of the dynamics turn the players focus toward locations. As an example *Fruit Farmer* draws the players' attention toward sensing the relation between physical and digital space, toward dizziness, and speed. Thus the dominating dynamic in *Fruit Farmer* is the action dynamic focusing at bodily sensations and advancement in space. This does not mean that the game does not relate to locations on a significant level. Players need to seek "fruit" at specific locations and avoid the proximity of the wasps. Further, as mentioned an LBG can have a combination of dynamics. The dynamics are briefly described one by one below.

The action dynamic is all about sensing the body – its limits and possibilities. Players are challenged physically on their endurance, sense of balance, aim, speed, etc. To create an LBG that enables the action dynamic, the actions of the player need to happen primarily in physical space. The representational space can be used to guide players toward new types of movements in physical space (cf. *Fruit Farmer*, p. 242).

The transcendence dynamic describes how the LBG can offer possibilities beyond those normally experienced. Often this is possible due to computing, as computing can expand our abilities (Murray, 1998), and cognition (Hayles, 2004). The player relates to his/her own

actions and become aware of how the performance changes. The transcendental dynamic concerns expanding the player's abilities and reach in space using the LBG and by focusing on how the player can outdo him/herself, and do things not normally done. LBGs in particular can expand the players' reach beyond the immediate situation, so that they can share the locations visited with players at other locations and beyond the horizons of space and time. They can also relate to themselves from the outside – experience self-monitoring.

Appropriation is concerned with connecting locations through movement (de Certeau, 1988). The appropriation dynamic relates to how players put their personal mark/perspective on a location through the way they move and make choices in the LBG. Appropriation dynamics can allow LBG players to conquer locations or items but can also be more subtle, as the players immerse themselves in a location. Finally, players can appropriate locations without engaging deeply into them – as mere stages. Accordingly, appropriation can promote a relation to the locations and a sense of ownership or belonging.

The social dynamic in LBGs is stated through players' actions related to either competition or cooperation. Designers can encourage either competition or cooperation through the interface and rewards. If the LBG is meant to be competitive, players need to be able to compare their progress during the game, both to be able to change strategies and to increase arousal. Designing for cooperation in LBGs means the designer must consider the roles of all players, as each one needs to feel that he/she has an influence on the game outcome (cf. Section 5.1.1). In addition, the designer attend to which access each of the players has to the interface, as having options is connected to the interface through which the actions are made.

An LBG with an exploration dynamic leads the player's attention toward elements in space (and time). Being explorative can bring about new perspectives and surprises for the player. Exploration is about moving throughout an environment in order to learn about it. The player who is committed to the exploration dynamic is aroused by experiencing new things, and thus the game should pique this curiosity. In LBGs, designers can frame ordinary space in a new ways. This makes LBGs interesting tools for letting players learn about their hometown or alien environments through play and to contextualize a topic spatially.

The imaginative dynamic relates to experiencing a narrative by becoming absorbed in it and thus it directs the players' attention toward an external imaginative world, which in LBGs is blended into the ordinary world. The dynamic relates to the player's desire to find an imaginary world in the ordinary world. However, in LBGs players do not leave the ordinary world and enter an imaginary world. They are physically present in the "real" world and create links between it and the fictional one.

In this chapter, the conditions that influence how the players create the LBG experience have been analyzed and presented. Thus, the structure of LBGs and the practices that create player experiences was analyzed as well. This has continuously been related to the design and conceptualization of LBGs. In other words, the research questions have been explored. Next step: the conclusion.

8 Conclusion
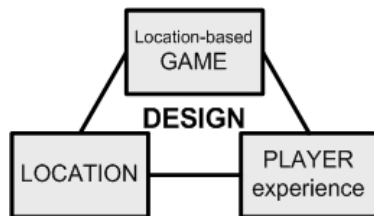
This dissertation has explored the prerequisites for a meaningful meeting between LBG players and the locations these games involve. It has contributed with a theoretical conceptualization of LBGs, empirical analysis of LBG structure and player experience, and design knowledge. First, the elements of LBGs have been discussed and a conceptualization made. Second, the structure of framing, content, and media of LBGs have been explored in relation to the boundaries that relate to locations and players' perception of, and actions taken toward them. Third, players' play practices have been studied in relation to handling the possibilities within the LBG structures and create meaning out of them, i.e., how players create an experience using LBGs and in relation to their context. Finally, the findings of the dissertation have continually been related to design throughout the dissertation.

The dissertation contributes with an understanding of LBGs and gaming, as well as offering a vocabulary to describe this phenomenon. The dissertation contributes with knowledge that supports the design of LBGs to make new and better uses of the boundaries between play and ordinary, authentic and fiction, digital and physical media. In other words, knowledge concerning creating LBGs that makes use of the particular opportunities that emerge when combining location-aware technologies and computing with game mechanics has been provided.

The most direct and practical contribution is the creation of the LBG *Visions of Sara*. People continue to play this LBG in Odense more than two years after it was launched; moreover, it is used as a showcase for *DJEEO,* enabling the company to sell similar LBGs.

In this conclusion, the pertinent research questions are addressed in the following order:
- How can we conceptualize LBGs and spatiality in relation to LBGs?
- How does the player create an experience playing an LBG set in the ordinary world?
- Which prerequisites will make the meeting between LBG player and spatial locations meaningful to the player?

8.1   Conceptualization of Location-based Games and Spatiality

To understand LBGs and to challenge the design of them, we need to conceptualize LBGs, their relation to spatiality, and the role that locations play in LBGs. These concepts have been pursued to illuminate our understanding of LBGs and to encourage LBG development. In Chapter 2 definitions were provided that had technology, framing of play, the use of locations, the purpose and player experience as a point of departure. This conceptualization offered here takes the meeting between players and locations as a point of departure, focusing on how LBGs facilitate this meeting.

LBGs fit these requirements derived from the definition of LBGs and developed through the dissertation. This is a refinement of the initial definition in Section 3.5, page 115, as the definition below has focus on the requirements for a meaningful meeting:

Location-based games are games that allow players to play in everyday spaces through the use of location-aware technology and wherein outcome is related to the movement of the player and the locations the player has visited. LBG play happen on the boundary between the following dimensions: play and ordinary; authenticity and fiction; and using digital and physical media:

- LBG play is affected by and affects the multiple contexts, in which the player finds him-/herself. The ordinary contexts were not originally intended for the game. The player negotiates the boundary between play and the ordinary world, while playing.
- Through framing of its content, the LBG can provide the player with opportunities to interact with and give authentic entities (new) meaning through play. LBGs can bring fiction into everyday spaces. Further, the LBG can blur the intention of content, thus the content of LBGs is often ambiguous. LBGs can also encompass content that is independent of designers and players and is resistant to exhaustive exploration. Finally, LBGs can offer the possibility of performing actions that are indexical and thus feels authentic.
- LBGs are distributed in physical space through the use of location-aware technology. The player's body and the physical locations both play meaningful roles in the LBG, as the LBG requires movement through and interaction with physical locations. The properties of these physical locations affect the player experience and can be used in to stimulate the player's senses. This is combined with digital media's ability to

expand our reach and abilities in everyday spaces, and the media works as a liminal interface between body, mind, and locations. LBGs should do this without blocking out the world, but letting players experience a hybrid intuitive space, i.e., they experience locations through the patterns provided by the LBG. Through these the player can also interface between LBG and locations.

It varies how LBGs use these boundaries. By pushing these boundaries, LBGs create new play movements in and perceptions of ordinary space. Through play, the player incorporates the structure of the LBG, which affects the player's attention, perception, and actions. Due to this incorporation, players can experience pleasure, the main reason for which one plays LBGs.

To support the meeting between player and location, the LBG must guide the player's attention toward this meeting. The meaningful meeting between players and locations can emerge only when players are presented with possibilities that allow them to interact with their environment and let the environment affect the players.

Through the analysis combining theories and empirical findings, I have developed the model Designing Boundaries of LBGs. In it, features of each dimension are listed to highlight the key characteristics and differences, and questions are developed to explore the use of boundaries. Thus, the model can be used to analyze LBGs to find out how they relate to spatial locations, to meaning, and how they frame content. In this way, the model is a tool for conceptualizing LBGs, and their relation to spatiality. The questions related to the model in Table 6, p. 292 can be used to systematically go through the boundaries and dimensions, and imagine how they are experienced in the LBG that the designer is developing.

The boundary between **play and ordinary** is concerned with the context of play, i.e., where people play the LBG, by whom, at what time, and who else surrounds the play situation. The boundary relates to both how play is related to the ordinary world and the internal context in relation to how players are motivated in the game, as it is concerned with the emphasis on process and progress.

Through the design of LBGs, the boundaries of the game can be understood more or less clearly. LBGs can be embedded in the everyday spaces, and be played in parallel or

superimposed onto everyday space. In relation to how the LBG comes across as a game to players and passersby it can range from overt to discrete. The less clear such boundaries are, the more ambiguously the player experiences the LBG. LBGs challenge the players' ability to negotiate the boundary between play and ordinary.

Players bring the ordinary world, i.e., cultural conventions, knowledge, skills, and habits into the play situation. Some they abandon within the frame of the game, whereas some still count. LBG play cannot be entirely separated from the ordinary context in which one finds it. However, it still distinguishes itself from the ordinary due to its intensified meaningfulness. In addition, actions and events are understood differently than they ordinarily would be, and play does not last forever.

Players can be playful or serious in terms of attitude. They shift between these mindsets results from either internal or external conditions. These shifts affect the way players act in physical space as well as their motivation. In LBGs, players experience playfulness in situations that normally would be interpreted as ordinary.

Whereas the boundary between play and ordinary is concerned with the LBG's relation to the context encompassing players and passersby and everyday life as such, the boundary between **authenticity and fiction** concerns itself with objects, actions, and events in the LBG: the "content" on which the LBG is based. The focus on authenticity and fiction regards the significance of actions and objects, the ways they manifest themselves, their substance, and the way their significance changes in LBG play. In relation to the boundary between fiction and authenticity, the LBG designer can make use of material independent of either player and designer, which works as a realistic representation, offers authentic challenges and actions, or gives everyday life actions in-game meaning. The designer can also create a fiction for the players to explore, or use fiction to convey the meaning of the game. In this way, the fiction in LBGs can be both a tool and a story that offers an alternative world that has its roots in the authentic world.

When the LBG is about narrative involvement, players use the LBG as a tool, creating location-based fiction. To support this involvement, the story must be coherent. Fiction can be part of the game-play in an LBG, even when it does not invite the player to explore a prefabricated storyline. Instead of creating a story, the LBG designer can offer a theme-based

game in which players tell a story through their movements and actions. Also in this case, the player is creating relations between content and locations via his/her actions. The player can act out the story and participating in its atmosphere. LBGs can interweave authenticity and fiction, letting the very matter of reality become stories. When players are involved in an imaginative dynamic, players are productive, as they imagine and act on the relations between LBG, fiction, and authenticity.

Authentic content can be used in LBGs, altering or making use of its significance. When players meet such authentic content in LBGs, it can resist some exploration, since its significance encircles and permeates the matter. The authentic exists independently of the perceiving person and his/her perception of it. However, whether the element is perceived as authentic also depends how the player relates the element to the designer's intention and how it is framed (cf., Table 1, p. 198).

The LBG's content can be based on something authentic: "real" facts, "real" friends, "real" (non-game or indexical) actions, or "real" problems. These authentic elements are mixed with fiction. In other words, LBGs can be designed to use this relation to reshape stories and allow players to craft stories from the fabric of reality.

In this dissertation, I have analyzed and described how content can be framed and woven into the LBG in different ways. Some are static in the sense that they do not move from the location nor is such movement expected. Other elements are dynamic and are not bound to location or time. The dynamic elements can change; thus they seem authentic and alive. Placed elements are brought into the environment by the game designer. Staged elements are intrinsic to the environment and not intended for the game. The designer makes them part of the LBG. Player-incorporated elements are native to the environment and also are not intended for the LBG. The player integrates them into the experience. Thus, these categories contribute to a vocabulary on how LBGs interface with physical objects, which allows us to explore these relations and discuss their workings.

LBGs use both **digital and physical media**. As we have seen, some objects are not actually represented but rather reframed and used as game media. However, LBGs also use digital content with which players can interact and manipulate. Being able to combine physical and

digital media gives designers new possibilities with regard to design for the space of bodily presence without having to abandon the flexibility of digital space.

To exploit this possibility, the LBGs should be designed so that playing them requires players to use their senses by encompassing spatial features and experiential aspects. With the active use of physical space in the LBG, it is possible to insert a direction into the game that guides the player through space. The LBG provides a structure for physical space that makes players move in new ways and perceive locations through incorporated game patterns. We are always in interaction with the physical space surrounding us. This interaction is two-way, which means that in LBGs, locations can affect us and we can affect them.

Physical locations can be used in LBGs in numerous ways: as scenery to create atmosphere in which players can become spatially involved, as a stage for the player's performance; or to challenge players and put them on the line. LBGs can challenge the player physically, offer a story in the ordinary world, it can be a tool for socializing in everyday spaces, let them experience transcendence, allow them to appropriate and/or explore the city. In this way, LBGs have the potential to tap into the richness of the physical world – and should not block it out. When using location-aware devices, the designer must consider how much attention technology needs in the game, and how to deal with the seams between systems used. Breakdowns and losses in translation can interfere with players' experience but also be used in LBG design.

Through the use of code, information can be laid on top of the physical space, digital and physical spaces can be separate (mixed reality); information can be retrieved from and delivered to physical space, augmenting it (augmented reality), and technology can be woven into the fabric of the everyday world, creating a hybrid space. These distinctions should be understood in relation to design, not to how locations are experienced.

The interaction in LBGs does not happen solely through hardware that displays the game, e.g., a keyboard and screen. Players can interact with physical objects not intended for the game and with the environment as well, as computation can be distributed. The interfaces of LBGs also encompass physical elements that are not augmented by computation and players too, since both can translate meaningfully between systems. It can be a challenge for the LBG to "sense" what the players are doing when playing, as they are not performing the

actions within a computer's mainframe. Designers must deal with this uncertainty in the structure of the LBG, so that players are trusted to regulate their possibilities and report their actions, or that the LBG limits possibilities to avoid cheating. In general, players can be trusted, since they want to follow the guidance of the LBG and they trust in that the game will offer meaningful play, i.e., they have a lusory attitude.

Through LBGs, designers can structure players' perception of locations, so that it transcends their everyday perspective. By using code, LBGs can provide us with a "reading" perspective of our own "writing" in space, i.e., players can move in space and see their movement concurrently. Further, LBGs can transcend how our bodies are locked to a time and space, letting players explore these horizons. Through the design of *Visions of Sara*, it has been demonstrated how LBGs can bring the space to which we are blind into focus. In this way, LBGs enable players to transcend the ordinary perspective on spatiality and their relation to it.

LBGs can augment what we already do while walking through the city. Players can thus appropriate the city and share it with their friends. Their expression of locations and their presence in the world is extended beyond passersby. LBGs most often are set in urban space, and thus players are acting in two systems simultaneously: the city and the LBG.

These dimensions and the boundaries between them should not all be used for the sake of using them. It is not a matter of the more the better. Such use should support the player's creation of an experience and thus support the possibilities that are linked to reach the goal and intended to increase arousal of the player. The LBG experience is a product of an interaction between players and their context and the tools they use to frame their actions and locations. The player is productive in this process (cf. Section 7.3). Designers provide a framework, the LBG, for them to use.

The LBG pervades everyday spaces. At the same time, it allows the player to pervade their environment by interacting with, and making new sense of it. This pervasion involves the player's body and imagination.

8.2   The Location-based Game Player Experience

Players are active in creating and exploring the boundaries of LBG. Players do this using the possibilities made available by the LBG, and their attentions are guided by it. In this way, players use the LBG as a tool to create the experience. Creation of this experience is the topic of this section that concludes with this question: How does the player create an *experience* playing an LBG set in the ordinary world?

A theoretical pivot for this dissertation is the premise that we are "condemned to meaning" (Merleau-Ponty, 2002). Everything we do has some meaning. Meaning is created in the interaction between the conscious person (body and mind) and an object or idea toward which this person is directed. This idea of direction of intentionality is relevant when trying to understand players' actions but also when trying to understand their expectations regarding what they meet: the LBG holds an intention, for human beings created it and imbued it with meaning. We expect and trust the LBG to "want" something. When playing the game, players enter into a dialogue between their own intentions and those of other players, and even with those laid into space – the legitimacy of space – along with that of the LBG. This negotiation of intentionality is seen in the LBG players' actions and responses to the elements they meet as they play.

The purpose of game rules is to constitute possibilities as relevant and regulate players' movements. Through the rules effective solutions are hindered, this is done in order to offer players challenges. In LBGs, both constitutive rules and regulative rules can be negotiated by either or both the system and players. It can be unclear to players which possibilities are allowed, valued, or even recognized. When the possibilities are not clearly defined, players can become confused and even feel as if they are cheating. Therefore, the designer should be thoughtful in creating the rules and feedback that indicates how the game can be played, i.e., its intention. This feedback can be story, information, changes in possibilities, or progress toward the goal, or even retreat. Designers should be thoughtful in this process, because the dissertation has found that players experience their play as being more satisfactory if they can solve tasks within the game's frame. Note that this does not mean that designers should avoid ambiguity, which can be a pleasant challenge.

The dynamics in LBGs relate to certain aspects toward which the player's attention is guided. These aspects are spatial: they either are of the body and use properties of space, or let

player's relate directly to locations. The LBG should guide the player's attention and thus actions into patterns that can cause pleasure, i.e., a meaningful whole. The dynamics in LBGs relate to the ways in which possibilities can be used to create moods and raise or lower arousal states, as a dynamic directs the attention of players and relates to their motivation. Over time, players choose according to their motivation. It is different which dynamics players prefer to explore in achieving arousal, depending on taste and situation. Some want to immerse themselves in the narrative or explore their surroundings. Others like the excitement of a fast game and competition. The latter group prefers the boundaries that make it easy to compare progress, such as a time frame and points, whereas the former rejects such a concept, because striving for points as well as playing within a time frame can detract from the fiction and the exploration. These approaches also relate to how the player acts in space. The goal and type of possibilities and restraints should be balanced.

The player's motivation and the goal of the game are used to access the relevance of possibilities. This evaluation happens during the game, as the players grasp what "works," i.e., what is meaningful to them. When they have experienced a pattern that works, they will try to maintain it. The player derives meaning from within the context of the environment, the rules, the objectives, the story, and the player's own knowledge/experience base. The player, the LBG, and the environment are all part of the creation of a meaningful whole – the LBG experience.

The player of an LBG participates in spatial locations and affects them through this participation. The player is productive in creating places, acting out the LBG, and connecting it to locations. The LBG provides players with possibilities and guides their attention through rules, a goal, and a narrative. The environment is active, pushing and pulling the player.

8.3   Meaningful Meeting: LBG, Locations, and Players

An experience is a meaningful whole. It is the result of repeated meaningful actions, i.e., actions that help the player experience the desired state of arousal, which are relevant in relation to the goal of the game, and related to the context. In relation to LBGs, play experience is affected by the balance between the dimensions described and the dynamics used. Both dimensions and dynamics relate to the relationship between LBGs and locations.

However, which prerequisites will make the meeting between LBG player and spatial locations meaningful to the player?

There is no "proper" meaning of the LBG, despite what the designer may have intended. The designer does not create an experience. The experience is a result of the interaction between locations and player, although the LBG frames this meeting. The environment actively pushes and pulls the player, and the LBG affords opportunities, takes others away, and offers a framework in which meaning can be created. The player creates this meaning using the LBG; thus, the LBG must support this process. This is why the LBG must have an intention: It must guide the player's actions. It must provide a goal and the means to reach it. It must stay true to the dynamics of the game and enhance them through its feedback, and offer interesting, challenging possibilities that can help the player reach the desired level of arousal.

Through their actions, players act out the LBG at locations and experience these locations through the LBG, or players create locations. In order to be a meaningful meeting between player and location, it should be possible for the players to actually interact with and affect the locations and vice versa. It must be part of the game-play due to either its spatial affordances or specific elements of it. In this dissertation, I have offered an analysis of different types of LBG game-play as well a list of the dynamics specific to LBGs. Although these are not exhaustive, they show ways in which LBGs should relate to guiding players' attention and motivation, i.e., the creation of meaning.

To be an LBG that allows players to experience a meaningful meeting with locations, the game also should intentionally involve several of the six dimensions and play with the boundaries between them. LBGs bring play into ordinary spaces, such as the streets of a town. In such a venue, nothing is created to serve the purpose of the LBG. The LBG adds an intention and a purpose for the meeting between player and the spaces with which he/she engages. The LBG should organize the players' attention and expectations to form new movements and perspectives on it. It inserts a structure into ordinary space. The LBG should not block away the experience of being a situated agent.

We can think of LBG play as an action by contact: Players sense and interact with their surroundings through the LBG; it is incorporated, not unlike the way a blind man senses his

surroundings through his stick. Play becomes truly interesting when players focus not on the LBG, but rather on the elements toward which the game directs their attention. Then, it is not a mere meeting between player and LBG; on the contrary, the LBG is a mediator for the meeting between player and locations. It creates a hybrid intuitive space.

When the meeting between players and locations is meaningful the LBG does not merely superimpose a "game layer" over our world. Instead, LBGs provide us with new ways of meeting, merging, moving within, perceiving, and interacting with the ordinary, authentic, and physical world in play. LBGs designed for meaningful meetings could be the satellites of our time, that let us marvel at the beautiful, colorful world that we inhabit, ponder how it is constantly recreated, experience our presence in it or encourage us to appropriate it.

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Data is found in a designated Dropbox folder (to sign in find the attached CD).

10.1 Data Overview

Date	Headline	Description	Data form	Participants
Oct 2007	Land of Possibilities?	Playing land of Possibilities with Gerlev students	Notes	Students
Jan. 2008	DJEEO game in Svendborg	Playing the DJEEO Education game. Discussion afterwards	Notes	16 players
Feb 2008	Creative Camp – group work	Creating a concept in the group – the experience gave me a lot of ideas for Saras Syner	Notes	Team including me
March 2008	DJEEO "Skolebogsmesse"	Following two teams at "messe" playing DJEEO Education.	Notes	Eight students
Spring, 2009	Fruit farmer	Playing it to experience it	Notes	Me
Jan.-Apr 2009	Development of Visions of Sara	I developed the location-based game Visions of Sara using a platform developed by DJEEO. This includes a number of sessions	Notes during the process The game "Visions of Sara"	Me, DJEEO
2009	"DM i DJEEO" School in Cph	Observation of DJEEO Education	Notes	A class of students
2009, Spring	First test of Visions of Sara	I played the game with a collaborator. There were problems with the system, so I stayed in the base throughout the game. "Participating observation".	Field notes Changes in design	Two players. I was one of them

2009, Spring	Second test of Visions of Sara	I played the game with a friend. "Participating observation".	Field notes Changes in design	Two players. I was one of them
2009, Spring	Visions of Sara, Concept description	I wrote a use case that described how "DJEEO Play" could be installed at a camp site. This helped me thinking how story could be part of the game	Notes (confidential due to DJEEOs business)	Me Feedback: DJEEO
20/3 2009	Premiere Visions of Sara	Game session, informal interview, mail correspondence with players afterwards	Notes Answers from players Photos	16 players
26/5 2009	Land of Possibilities?	Game session and interview with players at the Open Air Museum.	Audio (1 hour and 20 mins) Field notes	Six players – two teams ~20 players for the interview
29/6 2009	Observations/Focus group interview Visions of Sara	Game session and interview at Odense Library. 1½ hours of video of two agents. 3½ hours of game start, control base and interview	Video (5 hours) Audio (backup) Field notes	Seven players – three teams
2009, Fall	Interview with Wink Back Inc	The creators of The Go Game	Notes	
2009, Fall	Spy in the City	Playing it to experience it	Photos, notes after event	Two players. I was one of them
2009-2010	Foursquare	Playing it to experience it	Screen shots, notes	Observing others Me
2009-2010	Ghost patrol	Playing it to experience it	Screen shots, notes	Me

10.1.1 Secondary Data

Date	Headline	Description	Data form	Participants
Jan.-Aug. 2008	"Fortælbare steder" – project on the harbor in Odense. Includes some development of a LBG which was then stopped.	Working in a team – designer, landscape architect, architect and project manager (municipal employee) creating temporary spaces at the harbor	Presentation Notes	Me Team
Sept.-Nov. 2008	Development of prototype floor sensor game	Together with Jens (last name) I developed and tested a floor sensor game. The game was played by other players but never tested formally.	Design log Requirements	Students at Osaka University and me
2009, Fall	Interview with John Bela, Rebar	Creators of events in public spaces including "Park(ing) Day"	Notes	

10.2 Statements used in the Dissertation

The statements used in the dissertation come from different observations and interview sessions. Here the ones used can be found in Danish, as they have been transcribed.

Each quote in the text is followed by a bracket, e.g., [VoS, test, P1, #]. The first letters refer to the LBG played. Then there is a reference to the type of source (test, observations, interview, e-mails etc.). If the game is *Visions of Sara* it is also noted which phase the statement comes from (P1, P2, P3). Finally, a number identifies that particular quote.

10.2.1 Visions of Sara
Visions of Sara, Test, phase one [VoS, test, P1]:

These are not transcribed but taken from my notes.

[VoS, test, P1, 1]: "Det er sjov at jage efter svar i byen."

[VoS, test, P1, 2]: "Jeg er ikke med, læs lige digtet igen." (Elsebeth)

[VoS, test, P1, 3]: "Der lærte jeg lige noget nyt om min egen by!" (Elsebeth)

[VoS, test, P1, 4]: "Hun søger retfærdighed." (Elsebeth)

Visions of Sara, E-mail answers, phase two [VoS, E-mail, P2]:

[VoS, E-mail, P2, 1]: "Altså det ville være mærkeligt at spille et spil uden historie. Om det er Saras Syner historien, eller en anden historie det betyder ikke så meget, så længe historien hænger sammen." (Martin)

[VoS, E-mail, P2, 2]: "[…] man skulle finde tallene selv, på statuer man normalt bare går forbi." (Lasse)

[VoS, E-mail, P2, 3]: "Opgaverne må gerne være udfordrende og kræve noget af spillerne, men fx den hvor en af computeragenterne skulle på biblioteket, var måske lige lovlig krævende. For det første, fordi vi ikke vidste det kunne ske og for det andet fordi det er noget tidskrævende i forhold til den begrænsede tid vi har til alle opgaverne og især når belønningen så ikke var derefter." (Anders)

[VoS, E-mail, P2, 4]: "Jeg har sagt, det var sjovt, men lidt for meget løb for min mening, især når det var mod sportstalenter og unge gymnasieelever. Jeg synes, tiden spillede for stor en faktor i forhold til opgaverne." (Anne Marie)

[VoS, E-mail, P2, 5]: "Lokationsopgaven, hvor vi ikke anede, hvad vi skulle bruge den firkantede plads til, virkede ikke, netop fordi vi troede vi skulle bruge omgivelserne, og derfor gav den ikke den helt store mening." (Lasse)

Visions of Sara, Focusgroup Interview, phase three [VoS, FI, P3]:

[VoS, FI, P3, 1]: "Kloster vibe."

[VoS, FI, P3, 2]: "Tampen brændte."

[VoS, FI, P3, 3]: "Det kan godt være en pointe, at folk tror de overtræder reglerne, og så Googler i smug og så har deres egen fest af det. Altså, det er jo også fint nok."

[VoS, FI, P3, 4]: "Jeg tror tilfredsstillelsen ved at løse en eller anden opgave, den er nok kun til stede, når man føler alligevel, at man har løst den inden for reglerne – inden for de rammer, der er opstillet."

[VoS, FI, P3, 5]: "Som spiller kan man alligevel ikke helt undgå at fokusere på point. Alene det, at der bliver sat point på, det gør, at man føler, det er en rettesnor [Tora: 'Mmmm']. Både fordi, at man jo nok alle sammen har sådan lidt en 'kompetitiv' side, men også fordi, at når man spiller et spil, så vil man jo egentligt gerne spille spillet rigtigt. Jeg ved ikke, hvem det er, man gerne vil tilfredsstille, om det er de andre spillere, eller dem, der har lavet spillet eller bare spillet selv. Men man stræber altid efter at spille spillet rigtigt og hvis der er point på, så må den rigtige måde være at spille spillet på, det må jo være at gøre det som rent faktisk giver nogle 'gode point.' Og hvis det så lige pludseligt giver rigtigt gode point at komme rigtigt hurtigt hjem, så vil den del af spillet veje rigtigt tungt, så tror jeg, man vil gå målrettet efter det."

[VoS, FI, P3, 6]: "vi gik på kompromis med vores løsninger."

[VoS, FI, P3, 7]: "Jeg synes, den var god, den der hvor man skulle finde navnet Carl på Albani kirken, fordi at man så kom ud et sted og så skal man finde et navn og så er det der rent faktisk og det er det rigtige. Det er fedt. At leder efter et eller andet og så få den tilfredsstillelse af at finde det [Interviewer: 'At finde svaret?'] Ja, på et eller andet som er ude i byen. Det virker lidt sejt og giver en idé om, at det hænger faktisk godt sammen."

Visions of Sara, Observations, phase three [VoS, O, P3]:

[VoS, O, P3, 1]: "Saras ser en nonne, der ligger død med en plante tørrede … med en buket tørrede planter på brystet. Hvilken plante er der tale om? Skriv navnet på planten med små bogstaver. Hint: Måske kan I finde svaret hvis I følger navnet, emnenummeret og sidetallet

på biblioteket. Det er ikke for børn. [Pause] Er der et bibliotek der i nærheden, hvad? [Pause] Mmmm, er der ikke en plakat for et bibliotek? [Pause] Er der noget andet?"

10.2.2 DJEEO Education

DJEEO Education, Krogårdsskolen [D.E., KS]

These are not transcribed but taken from my notes.

[D.E., KS, 1]: "blive ved flaget."

[D.E., KS, 2]: "De står jo der ved posten!"

DJEEO Education, Skolemesse [D.E., SM]:

These are not transcribed but taken from my notes.

[D.E., SM, 1]: "Hvor mange point giver den?" [Partner svarer på spørgsmålet] "Lav den, vi har tiden."

10.2.3 Land of Possibilities?

Land of Possibilities?, 8th grade [LoP?, 8th grade]

[LoP?, 8th grade, 1]: In Danish: "Det her er en bette, lorte gård! Vi er hjemme!"

[LoP?, 8th grade, 2]: "En tonser-strategi."

[LoP?, 8th grade, 3]: Dette siges på engelsk: "Sorry, folks!"

[LoP?, 8th grade, 4]: "Du siger bare til, når du har fundet den."

[LoP?, 8th grade, 5]: "Hvis De ikke er bange for at stå med fingrene i koldt vand nede ved vandløbet hele dagen, så tror jeg godt, min kone kan bruge Dem."

[LoP?, 8th grade, 6]:

Pige 1: "Det gør vi bare. Kan man sige 'ja'?"

Pige 2: Siger: "Ja!" med en høj stemme rettet mod telefonen. Griner henvendt til sine holdkammerater og siger: "Nej."

Pige 3: "Så skriv 'valg ja'."

Pige 2: Siger: "Meget gerne ja. Ja," med en høj stemme rettet mod telefonen. "Kom nu, hvad skal man så?"

Pige 3: "Jeg tror bare, at de går ud fra, at vi siger ja ikke også. Har vi fået nogen penge?"

[LoP?, 8th grade, 7]: : "Det kunne være, vi skulle banke på først."

	Catch-Bob!	REXplorer	Frequency 1550	CitySneak	Feeding Yoshi	Treasure	URAAY	CYSMN?	Bot-Fighters	Geo-caching
"Hide'n' seek" (fi/or hide things nd and at locations)	Catch-Bob! (find bob)	REXplorer (Find NPC)	Frequency 1550 (find hotspots)	CitySneak (find cameras)	Feeding Yoshi (find wifi access with and without password)	Treasure (find coins and wifi accesses)	URAAY (find office)			Geo-caching (find cache)
Proximity (Proximity to entities triggers game events)	Catch-Bob! (proximity to bob)		Frequency 1550 (booby traps)			Treasure (between players)		CYSMN? (proximity between players)	Bot-Fighters (proximity between players)	
Atmophere/authenticity (Locations are used as a "stage" – due to their atmosphere)		REXplorer (learn about Regensburg)	Frequency 1550 (learn about amsterdam 1550)				URAAY (The office)			
Infra-structure (the infrastructure of the location is used in game-play)				CitySneak (use existing infrastructures as a resource for design)	Feeding Yoshi (Seamful design, weave into everyday, ambiguity)	Treasure (Seamful design, social play, ambiguity)				
Location – scene of performance (Players use location as a scene for their performance)		REXplorer (gestures)	Frequency 1550 (playing out scenes)	CitySneak (surveillance)			URAAY (per-forming)			
Topography (Location is chosen for its spatial features)								CYSMN? (maze – running)		
Primary game space is both in digital and physical space (where players act/move)			Frequency 1550 (Online and onstreet)					CYSMN? (online and on-street)		

Figure 67: Overview of relations between the played and observed LBGs and locations.

	Foursquare	Visions of Sara	Spy in the City	Ghost Patrol	Fruit Farmer	Land of Possibilities?
"Hide'n' seek" (find and/or hide things at locations)	Foursquare (find and create places)	Visions of Sara (find Sara's Visions)	Spy in the City (find action spots)		Fruit Farmer (find fruit)	Land of Possibilities? (find NPC)
Proximity (Proximity to entities triggers game events)	Foursquare (Proxi. of friends)			Ghost Patrol (proximitiy of moving ghosts)	Fruit Farmer (proximity of moving wasps)	
Atmosphere/autheticity (Locations are used as a "stage" – due to their atmosphere, objects there..)		Visions of Sara (learn about Odense)	Spy in the City (learn about spies)			Land of Possibilities? (original buildings)
Infra-structure (the infrastructure of the location is used in game-play)						
Location – scene of performance (Players use location as a scene for their performance)						
Topography (Location is chosen for its spatial features)		Visions of Sara (locations selected due to features)		Ghost Patrol (adapt to space)	Fruit Farmer (adapts to topology, which affects the game)	
Primary game space is both in digital and physical space (where players act/move)		Visions of Sara (online and onstreet)				

Table 5: Overview of relations between the played and observed LBGs and locations.

10.3.1 Question about boundaries in LBGs

Play: To which degree does the LBG claim to be a game? • How are the rules, and limits in time, space, and social setting conveyed? • What is not clear to the player in terms of rules and limits? • What is the intention of the space the LBG is set in related to the intention of the game?	**Ordinary:** To which degree does the LBG claim to be a part of the everyday life? • How does the game relate to time, space, or social setting of everyday life? • How do the appearance and actions of players relate to the contexts they are in and to everyday life (overtly or discretely)? • In which contexts do the players' actions have significance outside of play? • Which strategies does the LBG use to let players consider aspects of everyday life to be part of the game? • Which role does ambiguity play in the design? • How does the LBG guide players to relate the context of the game (its legibility, literacy and legitimacy)?
Process To which degree does the LBG seek to motivate players through process? • Which elements in the game lead the players' attention toward process? • Which elements are intended to be used for raising arousal? • How does the player relate to spatial locations through the game (exploration and discovery)? • Which conditions in the environment can affect players' motivation, and how?	**Progress** To which degree does the LBG seek to motivate players through progress? • Which elements in the game lead the players' attention toward progress? • Which elements are intended to be used for lowering arousal? • How does the player relate to space through the game (moving and advancing)? • Which conditions in the environment can affect players' motivation, and how?
Authenticity: To which degree is the game's content based on something authentic? • How does the game relate to and include authentic environments, event, actual friends, (non-game) actions, or authentic problems? • How does the LBG relate to indexical actions? • How is the designer's intention with elements conveyed? • How does the game's framework apply to areas of the players' everyday life as content? • How does the game enable players to make links between LBG and content themselves? • To which degree and how does content depend on players and designers?	**Fiction:** To which degree does the game tell a story? • What is the fiction of the game? • Which function does this fiction have? • How does the LBG augment locations with fiction? • What is the coherence in the fiction? • Which elements of the game show that its focus is on an imaginary world and how (if any)? • How are elements framed as being part of the fiction?
Physical: To which degree does the player use his full body? • Which senses does the game stimulate, and how? • How does the game challenge the player bodily? To which degree does the LBG use physical space as a scene for play? • Which aspects of the locations affect players' game experience? • How is the fit between atmosphere of the location (if it is a specific location) and the game? • What are locations used for in the game? • Toward which spatial elements are the players' attentions directed?	**Digital:** To which degree does the technology expand players reach? • How does use of the digital media expand the reach of the player spatially, temporally, and socially? • Which perspectives does the use of digital media open to the player that would otherwise not be available? • What is the relation between game-play and use of digital media (could the game be played without it)? • What is the relation between physical and digital media (separate, overlaid or intertwined)? To which degree does the technology require the player's attention? • What is the significance of the digital information in relation to information from the physical surroundings? • How does the game add digital information to the physical world? • How does the game support blended attention? •

Table 6: Questions about the boundaries of LBGs.