THE MAP
THE MOBILE
AND
THE PHYSICAL

LAYAR AS
A CASE-STUDY

BY BERNADETTE SCHRANDT

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SUMMARY

In this thesis the concept of performance cartography is researched in the realm of mobile mapping, an activity that has become more popular through enhanced technology. Specifically, the mobile application Layar is used to understand the changing relationship between the user and maps. Within this context, the performative will be investigated in two ways. Firstly, performance cartography is related to the act of mental mapmaking, where mapping can be understood as an activity in which information derives directly from our cognitive 'databases'. As enhanced technology increasingly enables the user to add cognitive information, it is imperative to investigate this process in more detail. In my thesis, I propose to look at these cognitive 'databases' through a framework of the 'theatre of memory' as suggested by Giulio Camillo where several databases intersect through the act of spatial movement.

I here encounter my second point of investigation, namely performance cartography as an *act* of performance: the (embodied) act of staging in a specific time and place. The memories captured within both Layar and the user are only to be awakened by an interaction that includes the entire body; for it is the body that enables the user to navigate through the map. Within this section, the here- and nowness of mapping is discussed, which is specifically an interesting issue when looking at the current development of mobile mapping systems and applications. Both technological and physical (in terms of embodiment) relations are investigated, as both elements are crucial to the act of this type of performing: without mobile technology there would not be such an application as Layar, and without the intervention of a body, there would be no interaction at all. Throughout this thesis, Actor Network Theory and the rhizome form the leading basis of the arguments; they provide a framework in which the network of transformations is revealed that appears to be crucial to a thorough understanding of the experience within performance cartography.

PREFACE

What would I do without my mobile phone? Where would I be without my laptop? Or, more importantly: how would my life look like when I did not have something like the Internet flowing around me? In these questions my curiosity for mobile media is to be found. Specifically I am interested in the way these technologies – that connect present scenes to other places around the world in current timeframes – (unconsciously) influence human behaviour; hence how we as persons deal with the resources that are available to us and influence perception. Especially when taking mobile phones into consideration, I encounter a growing fixation towards applications for mobile phones – even in such a way that only the collection of applications becomes a sport in itself. This observation formed a first step towards the subject that is discussed within this thesis.

I became aware of a trend in which GPS technology is put at the centre of consumer entertainment – 'come buy this product and you can always see where you are at any moment!' Here, the goal is not to give the user directions to find her destination, but rather to just let the user experience the environment she is currently standing in. One would think that such information is redundant – for without technology one can fully enjoy her ambient surroundings too – but it is fascinating to see that GPS applications used for entertainment objectives are becoming so popular. I must admit, I myself am guilty to such behaviour too. GPS maps are interesting, in particular those that have a compass in them and move with me: they visually translate my physical location into an abstract representation of the surroundings I ought to be in at that moment. But most importantly: they provide me with extra information that might come out handy or just pleasantly.

This thesis, then, is about a mobile mapping application called Layar that lets the user discover and experience the surroundings she presently stands in. In my journey to examine how one can understand mapping principles in this type of cartography (which I will later refine to performance cartography), I hope to offer the reader a pleasant reading experience, but moreover, to give her new insights into the field of mobile mapping activities.

However, before I hit the road, I would first like to thank my friends, Milou, Denise and Jolien, and especially my boyfriend, Merijn, for their support and advice during these past few months that it took me to put my thoughts on paper. Additionally thanks go out to my family and in particular my father, who has always stimulated me to look beyond the horizon.

But where would I be without the professional guidance of my tutor, Dr. Chiel Kattenbelt? It was a true pleasure working with him, in which I really enjoyed our conversations; never once did I leave without new thoughts, inspiration or excitement.

Utrecht, June 16 2010.

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INTRODUCTION

THE REALISATION OF WIRELESS INTERNET ACCESS HAS FINALLY BROUGHT WEB MAPS BACK TO MOBILE ENVIRONMENTS WHERE THEY ARE MOST NEEDED

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LAYAR. As I walk around with my mobile phone, I am confronted with three different layers of how I can perceive reality. To begin with, I see the world in its physical shape as it appears to me through my own eyes. Secondly, I experience a virtual representation of it through the eye of my mobile camera and lastly, I am confronted with the specific layer I have chosen to be presented on top of the virtual representation my camera exposes. The application 'knows' my specific location and it tells me who wrote which tweet in my neighbourhood. It also tells me who uploaded which video in my nearby surroundings. It shows me where I can find the nearest C1000 and it virtually lets me walk through Stonehenge. But not from a top view, as a regular map. And more than a street view, such as used in GoogleMaps. The map functions like an eye, located in the physical world and it moves when my hand does. This map is literally connected to my physical appearance.

VISUALISING IDEAS: UTOPIA OR DYSTOPIA?

In a video commonly found on the web, Microsoft shares her vision of the future in 2019. It shows the image of a society in which a layered and mobile technology enhances humans' ability to make thorough decisions, to communicate with people from different countries, and to find their destinations. Naturally, in the world humans nowadays live, this seems nothing new: computer systems that calculate chances of winning already exist. Applications that translate words into other languages are commonly used too. And a tool which offers its services to find destinations is also used regularly. So what makes this new image so different from what is already there?

For starters, it would have something to do with the fact that seemingly simple and ordinary devices are used for purposes that are now ascribed to keyboards and computer screens. The computer as a whole is fragmentised and relocated: parts have disappeared, found a new location or have been integrated into other processes. The kitchen table is no longer a place to cut meat and vegetables only; it has become a place to read the news directly deriving from the table itself. In this time period, it is a location to pick up new ideas for recipes, simply by just touching the desk. The table moreover reinvents itself: through the course of time new functions are added while other vanish, encouraged by the behaviour of the one using it. Microsoft promises us that by 2019, not only the kitchen table but all sort of devices have become multifunctional and full of mobile technology. The walls, a card, a bureau, and the kitchen table: they all have technology in them, technology that tells us what temperature something is, but also which appointments we have that day, or what time our airplane will land.

Additionally, the concept of layered information appears to be a key term in Microsoft's future vision. Simply holding a card (or, well, a screen actually) up into the air against an object shows the owner extra information about the object; additional information that is also easily transferrable to other devices such as her desk. So not only are we literally entering an era that explicitly shows the different layers of our environment, being able to transfer these layers to whatever object we can think of becomes a significant facet of our daily life in 2019. The computer screen that we now know has become smaller and thinner; what lasts almost looks like just a thin piece of glass that is touchable and controllable through multiple platforms. The keyboard we are so familiar with now has disappeared, the only thing we need in 2019 is a projector and something to project it on, say, a desk (but anything will do probably) and touch it. In other words: the technological layers are not only mobile, but also ubiquitous: "anywhere, anytime, by anything and anyone" (described as the four A's) (Gutiérrez, 2009, xxiii).

For now, one can only guess how right Microsoft will be. And despite the utopian agency that is ascribed to technological advances, it remains an interesting philosophy to think about. In addition, to take a step further, the *need* to think about it is revealed when discovering that already existing platforms and software developments disclose the same desire: to offer layered information that is accessible at any point, by any device and transferrable by any possible platform.

TRANSITION TO THE NOW

FIGURE 1: LAYAR: SEE THE WORLD

One such example is Layar (http://www.layar.com), a very successful Dutch mobile application that digitally layers information on real-time images that can be regarded as a popular example of ubiquitous mobile mapping technology. It is a free and global application for mobile phones which gives real-time information concerning one's current surroundings that is made accessible through the camera of the mobile phone. Literally, Layar layers reality: it adds a new level of information to an already existing (and mediated) one: the physical world. It not only shows information, but it also gives the user the opportunity to personalise her ambient environment with the layers she would like to see while playing with the application.

This 'anywhere, anytime, by anything and anyone' vision that is carried out by Layar is, it is argued in this thesis, of influence to the way humans perceive and experience their environment. Within the realm of cartography, or more specifically, mobile mapping, I will examine this development where the user can experience her surroundings. During the course of this thesis, it is important to recognise a somewhat different approach from what is normally understood by the act of 'mapping': to create a visual abstraction of spatial surroundings. However, in this text the act of mapping is described from a users' point of view and entails the process of *understanding* and *navigating* through surroundings. It is not just those who design who do the 'mapping', but – even so importantly – users themselves are involved in a similarly process.

The question to start off with, then, is how human-computer relationships change through this different, dynamic, notion of 'location' and hence, how perception is altered through the intersection with this technology. Mobile mapping used to refer to the process of modern technologies (GPS, inertial navigation, and a high-speed digital camera) to capture centreline positions and imagery at highway speed, cutting survey costs and production time thereby laying the foundation for location databases of transportation assets and infrastructure (Grejner-Brzezinska & Toth 2003, 16). In this report, I would like to expand the discourse around this process to a much broader platform, as the given fact that mobile technologies (such as GPS and Internet) enabling the user to exchange data 'anywhere, anytime and by anything' calls for a wider interpretation. With, say, my smart phone I am constantly in contact with these mobile technologies, therefore continuously digitally mapping the routes I take and the choices I make. Furthermore, mobile technologies have also made it possible for me to add individual content to global systems, by which I am enabled to personally influence the global mapping system.

It is the latter issue that will be at the centre of this thesis, namely the personal relationship with a mobile mapping system, which is, it is argued, characterised by its performative character. The mobile mapping system is dependent upon both the user's location (where) and its time (when), together crucial to the act of performing and consequently accentuating the presence of the body.

Additionally, in his paper "Some Reflections on Change..The Past and Future of Cartography" cartographer Michael Wood states that "everyone's a 'mapper'" (Wood 2003, 111). He goes back in time and exposes the process of mapmaking in early communities, which foremost was, he describes, a mental process. He refers to this form of mapmaking as *performance cartography* ("mainly non-material, deriving directly from information in our cognitive 'databases'") and distinguishes it from *material cartography* ("fixed artefacts") (Ibid., 112). His distinction offers an interesting perspective for the type of mobile mapping that is discussed so far. However, in this research I would like to add an extra dimension to this, namely the embodied act of staging in a specific time and place for this appears to be crucial to the performative capabilities of Layar. Hence the objective of this thesis is to redefine performance cartography within the realm of mobile mapping, and argue that through a more enhanced form of material cartography, performance cartography has become an important activity in our daily life.

RESEARCH QUESTION

This brings me to the following research question that is at centre of this thesis, and for which Layar will be used to express ideas about the future Microsoft poses:

How does Layar, as an example of ubiquitous mobile technology, relate to the emerging development of performance cartography seen within the current climate of mobile mapping?

The type of research here performed is relevant because it sheds new light on the concept of performance cartography in the realm of mobile mapping, an activity that has become more popular in Western societies where smart phones are increasingly part of daily life – however, it must added, mostly characteristic to specific cultures only such as media studies. It aims to contribute to the field by presenting an interdisciplinary approach, in which both materiality and appropriation are of great significance. The urge for such an approach has also been emphasised in *Digital Material* (van den Boomen et al. 2009) in which it is stated that more attention has to be given to material matters of software "as it cannot exist by itself but is intrinsically embedded in physical data carriers" (*Ibid*., 9). To understand material matters, appropriation practices can be understood and analysed in greater detail (idem).

Theorists such as Bruno Latour (1999; 2004) John Law (1999), and Gilles Deleuze & Felix Guattari (1987) have already posed theories of how to study such complex phenomena. They argue that research should be more focused upon the transformative interrelations that are brought forth out of the things humans interact with. *This theory of a method* does not aim to map all the different elements humans or non-humans interact with, but rather focuses upon possible transformations within a given process. In this research that process concerns the analysis of interaction possibilities, and consequently, I argue, the creation of perception.

In the end, a popular application is described which appears, for many, to create a fascinating experience in how they can perceive reality: Layar sheds a new light on environments they currently stand in. The global attention given by the media reveal both its potential and a desire for such an application within society and it is therefore imperative to comprehend this practice by defining how users appropriate Layar and make sense out of it.

METHODOLOGY

It is specifically not my aim to focus upon technological aspects only and to continue the stream of thought in the light of technological determinism or digital mysticism (de Vries 2005; van den Boomen et al. 2009). It is a given fact that the developments described in this thesis operate within a diverse and complex landscape, which is interlinked with other aspects such as human agency. Nevertheless it cannot be denied that the technological parameters Layar presents evokes certain interactions and uses. Therefore, it remains important to firstly determine the ontological characteristics of this mobile application. Each chapter, then, focuses upon one such characteristic and aims to make a contribution to a thorough understanding of, what will be called, the performative cartographer (e.g. the user).

Chapter one focuses upon 'the map' and opens with the relation between a mobile application like Layar and the historical field of map-related activities. It then examines the possibility of the user to engage with the mobile application, in which a rhizomatic structure of appropriation is suggested. The main goal of this chapter is to understand *navigation* principles within Layar, a characteristic that is primary to the act of mapping. Throughout this section, a first modification to the notion of the performative cartographer is offered in which the role of the cartographer takes in a central position.

Chapter two points attention to the performative. It shows that it is, first of all, necessary to embed the concept within a discourse – a step that seems to be 'forgotten' by Wood – to be able to get into the principles of performance cartography. Both technological and cultural performative capacities of the technology and the user are taking into consideration, and again it is the interrelationship – examined through the framework of Actor-Network Theory (ANT) – between the two that shows some interesting outcomes with regard to the creation of agency.

Chapter three examines interactions between Layar and its user by taking the physical into account, and more specifically highlights the manner in which the physical body, characterised by its spatial and temporal 'limitations' (as one can only be in one place at once time), relates to the digital 'omnipresence' of Layar. My aim here is to understand how the "embodied self is extended, hybridised and delimited" (Vanhoutte 2010). Although much literature highlights distinctions between the virtual and the physical thereby examining 'true reality', is it not my aim to continue this debate – as the virtual *is* part of the physical and vice versa. Hence, the reason to centralise the physical is a decision made to examine the ontological characteristics of Layar. Through such an approach, I want to offer a better understanding of the relationship between the user and the program, for the body of the user functions as a pivot point within the application. Notions of embodiment – and corporal literacy – then form an important aspect within the act of mobile mapping, as it will be shown that this activity specifically demands the presence of a body.

In addition to the perspective of performance cartography that is offered in this thesis, it appears that such an approach can be very fruitful. The performative namely implies a co-presence of both spectator and performer where the performative value is judged through the senses of the spectator, thereby providing the necessary authority the performative needs in order to be regarded as such (Carlson 1996, Culler 2000). Consequently, chapter three builds further upon chapter two and analyses the relationship between the technology – approached as a screen that offers both reflective and immersive opportunities – and the body of the user. It shows that the performative cartographer is not just an entity that engages with the surrounding through her mind only – which is suggested by Wood – but that she rather engages with the experience through using her entire body. Perception then, it will be exposed, is not just a matter of cognitive methods, but includes physical movements too.

Chapter four centralises memory, for it is memory that takes in a central position within Wood's performance cartography: the performative cartographer acts upon information directly deriving from the cognitive database. It again will be demonstrated that such an approach is redundant for the memory of the individual does not occur apart from other memories – here discussed within the realm of collected and collective memory. Due to its ability to connect all four chapters, the 'theatre of memory' as proposed by Giulio Camillo provides the basis of chapter four. It will be shown that access to memories – crucial to even let the memories intersect with each other – is dependent upon performative mapping qualities of both the user and the technology; it is through this trait that the theatre of memory gains it significance.

To sum it all up, the focus points in the argument made in this thesis come down to the following: navigation, performance, embodiment and memory. The objective of this thesis is to provide the reader with some insights into the working principles behind the redefined performative cartographer as it will be here suggested. Additionally, it aims to situate the definition into the field where it really belongs: the field that discusses mapping as a form of appropriation through both the body and the mind. A few key terms are then given to understand the performative within mobile mapping: the relationship with the physical body of those who interact with it, social conventions (which will be dealt with in the realm of cultural and personal memory), and the structure of technology (thus how technology performs and triggers a certain behaviour). Within this analysis, interaction possibilities between Layar and the user will be the main focus of interest. It is through such an analysis that the creation of *perception* on the side of the user is understood.

To enrich the qualitative literature analysis that will here be performed, a couple of user observations are taken into consideration to provide a more thorough understanding of the appropriation possibilities offered by application. It must be noted, however, that these additions are only meant as possible interpretations; due to the fact that only three persons have been interviewed the information given by the interviewees should not be regarded as representative for the entire group of users.

SOME CLARIFICATIONS

Although the application that is dealt with is seen within the current climate of mobile mapping, it must be emphasised that Layar is not just a 'map' as people would currently conceive of it. Neither can it be seen as being similar to a paper map. It is, as Maurice Groenhart from Layar says himself, a map to *experience* surroundings (personal conversation 2010). This will become more obvious through the course of reading, however, it is important to already recognise the difference from a map only used for getting from point A to B – which is the most common understanding of a map – to a map in which the *experience of the user* herself becomes the central focus point. As will become clear throughout this thesis, Layar moreover *augments* the experience at a given time and location.

Additionally, when discussing 'the user', I do not wish to place the subject in the debate of active- and passiveness. Chapter one will briefly step upon this, but the reader must take note that it is not my aim to mingle myself into the discussion around active and passiveness when using this term. I have specifically chosen to centralise this expression – rather than consumer, prosumer or experiencer – because I do not believe cultural theorists have found a useful definition yet for those who are actively involved in the process of creating an experience, but are also still limited because they are dealing with pre-set conditions that determine their influence. The application is *used* to generate experiences through a relationship with its physical user – it is there where I find endorsement to my expression.

Lastly, I want to clarify myself in the following. Although Layar presents itself as an augmented reality mapping application, I will only implicitly refer to the debate of augmented reality. I have chosen to put this debate aside due to the fact that my research question involves matters that are more related to performance studies and mapping activities than to the debate of what augmented reality really is. Being able to only focus upon performative mapping possibilities – the core concept of this thesis – I therefore leave this debate to others interested in this specific matter.

CHAPTER ONE: THE MAP

SINCE ANCIENT TIMES,
THE MAP
HAS BEEN THE
FAVORITE
COMMUNICATION LANGUAGE
OF SPATIAL INFORMATION

MENG ET AL. 2005, PREFACE

EVERY single day, meaning is created out of the things that surround us. Attempting to define them, they are put into categories and comprehended through the various systems that have been constructed by the human mind. From its first inception, the human being tries to understand the world that surrounds her. To find food, tools, and shelter, but also to still the continuous hunger for 'knowing'. Consequently, spatial movements are the primary source of sensing and interacting with the world. In this chapter, Layar's development will be, first of all, embedded within a short historical overview to provide an idea of the climate in which the application currently operates. From there, it will be examined how to understand spatial movement and interaction possibilities with regard to Layar and its user in which a focus will be laid upon the concept of 'navigation', for navigation is primary to mapping activities. However, as it will be shown, navigation within Layar is not just going from point A to B, but includes many other aspects such as emotions and appropriation. The chapter provides a first step towards an understanding of the modern performative cartographer and how her perception is created, in which the act of mapping is not only to be understood as going from one place to another, but entails many interrelated breaks in between that influence mapping activities.

A LITTLE BIT OF HISTORY

Through the course of time, cultures have, not surprisingly, developed different systems to register environments and found distinctive ways to interact with it. But a common ground could be find in the presumption that in the beginning of mankind it is assumed most likely for humans to have habitually performed spatial related actions through using their cognitive databases, that is, without external mapping devices except for drawing in sand and on stones (Wood 2003, 112). Important rituals, such as hunting and gathering, were mainly carried out through the act of memory and verbal communication due to the lack of instruments – and knowledge – to create a full detailed map as we are currently familiar with. Despite the fact that permanent map artefacts can be traced back for at least 20,000 years, for instance within caves, communities basing their spatial movements on "mainly non-material sources, deriving directly from our cognitive databases" (idem), nowadays still exist. This is what cartographer Michael Wood (2003) refers to as *performance cartography*. It is not experiencing surroundings through retrieving pre-set information about the area on pre-programmed devices – a form of cartography that is nowadays often dealt with – but is rather based upon human knowledge and memories. It is an innate act; hence carried out from within the human body. Throughout this thesis, the notion of performance cartography takes the leading role. But, as the reader will notice, some (necessary) modifications will be performed to relate this form of cartography to the current climate of mobile mapping; a modification that – so will it be argued – is necessary as the concept of 'performance cartography' appears to be very functional in today's culture.

To illustrate the cultural differences in *material cartography* (Wood: "fixed artefacts" (idem)), the artefacts that are nowadays recognised as early utterances mostly include sacred, cosmological, secular and aesthetic themes (Jacob 1996, 194). Probably encouraged by over sea trade, maps were increasingly used for applications in geographical knowledge, such as harbour-finding charts (Tooley 1970, 15). Around the fourteenth and fifteenth century, usage of maps for navigational problems became more common, but the true stimulation for bringing maps into the public domain came with the invention of the printing press. Cartographers now increasingly aimed to create reliable maps whose representations were founded on actual observations and knowledge, leaving blank spots where information ceased (Ibid., 122). Although a variation in map production came into existence, the

actual use of maps was still mainly limited to specific user groups, such as the military, doctors and mountaineering communities (Wood 2003, 114).

The twentieth and twentieth-first century both characterised developments within cartography mostly by its technological changes, but the actual cartographic process maintained a dichotomy between professional map making and map use. Production wise, new techniques made it possible to improve data collection and thereby also visual qualities, due to (aerial) photographic techniques and later also by satellite intervention (Jacob 1996, 195). Accordingly, the process of map making became more 'user-friendly', both through enhanced drawing and production tools that created a "new class of cartographers" (Wood 2003, 113). Unlike early cartographers who had to take care of the entire process, it had now become the work of machines to gather necessary information, making it thus easier for non-experts to contribute to the field of cartography. These developments were especially useful for – and also encouraged by – the military, scientists and geographical planners, whose jobs relied a great deal on a thorough understanding of environments.

However, in order for paper maps to be used by a larger audience and specific target groups, they had to be distributed in standardised formats (idem). Nevertheless was it only after the Second World War that maps were also used by large audiences in society to eventually become as common and often consulted as they nowadays are. Seen from this perspective, it would seem that maps are currently experiencing glorious times, as they profoundly penetrate everyday life. Who does not remember those vacation trips where both parents are intensely staring at several maps, trying to figure out which route to take? Moreover, in the current 'new media' age, maps are easily consulted through websites, the most popular now being googlemaps.com, and navigation systems such as TomTom, accessed by computers, laptops but also mobile phones. The paper map still exists but is complemented by its mobile contester, accessible through all sorts of computerised (mobile) devices, seemingly making the map available at "anytime, anywhere, by anyone and by anything" (Gutiérrez 2009, xxiii). Naturally, when making statements such as these, one needs to be careful not being accused of teleological assumptions or digital mysticism (van den Boomen et al. 2009), and acknowledge certain power structures that do not involve the user. But while doing so, one cannot deny the ubiquitous character of maps and their thorough penetration in everyday life.

Anytime, anywhere, by anyone and anything: they are the four A's that describe ubiquitous and mobile technology. Mobile mapping has become a huge and wide-reaching phenomenon, finding itself not only in its digital counterpart, but moreover, also in mobile entertainment applications, such as chat programs. Encouraged by GPS techniques, spatial data acquisition literally becomes 'mass mediatised', especially due to its transferrable character. By relating these developments to the case-study of Layar, this mobile trait of maps, it is argued throughout this thesis, redefines the manner in which humans experience their surroundings. In this chapter, attention is paid to the role of the user within this type of mapping and a first step is made towards an understanding of how her perception of the environment is influenced by interacting with the mobile map.

LAYAR, THE MOBILE MAP

On June 16 2009, Claire Boonstra, Raimo van der Klein, and Maarten Lens-Fitzgerald – founders of SPRXMobile – launched their newest gadget for mobile phones called Layar. This being a mobile augmented reality (AR) browser, they created an application in which a digital layer is placed upon the camera image of a mobile smart phone. The user then, responsible for choosing a specific layer, experiences the world created through the lens of the mobile camera with something extra: she not only sees the virtual image where the eye of the camera is headed towards, but also experiences

additional information such as tweets that are currently uploaded or Wikipedia information about certain areas that are to be found in her neighbourhood. It is a mobile form of mapping where the information is not provided through looking at a top view of a surrounding, but where the information is accessible from within the actual environment through the eye of the camera. It is as if one would wear a contact lens that shows additional information about areas while looking at it. However, due to the argument made in this chapter, the working principles behind Layar will only be discussed in the following chapter where performance capabilities come into play. For now, I would like to focus upon the objectives Layar strives for, how these ideas are implemented into Layar and the consequences of this implementation for the interaction possibilities with its user.

With their application, Layar – now grown to a business of its own – wants to create awareness of the surroundings humans live in, showing how easy it is to visualise data flowing through the air. Getting inspiration from *Rainbow's End* (2006), a novel from Vernor Vinge, Lens-Fitzgerald too wanted to create an environment in which virtual layers could be placed on top of reality to play with information within surroundings. Together with Boonstra and van der Klein, he looked for possibilities to create such a tool, however, encountered the problem that mobile phones – the core business of SPRXMobile – weren't equipped with the right material for these ideas yet. However, when Android came on the market, supplied with GPS, a mobile camera and a compass, the first step to the realisation of their ideas came into sight.

"The objective of Layar is to make it accessible for a wide range of people", Maurice Groenhart, community manager of Layar, explains during a personal conversation on April 6 2010. "Although we are now only available for more expensive phones – Iphone and HTC – Layar will soon also be obtainable to more common and less expensive phones, such as Nokia and Samsung" (personal conversation with Groenhart 2010). Important to add is that Layar deliberately does not see itself as an augmented reality application, but, moreover, as a *web browser* giving access to augmented reality applications. "You can compare it to Internet browsers; they are windows to the world, they give the user possibilities to search through all the content that is available. Layar too is more like such a window than just one application" (idem). However, Layar does provide the tools to create augmented reality layers where users can choose from and scroll through. Hence, Layar both delivers the interface to navigate through the content and provides the tools for users to generate this content.

Especially Korea, the United Stated and the United Kingdom are very keen on the product, although, Groenhart adds, the numbers "change every week" (idem). In finding an answer to its growing popularity in these countries, Groenhart explains: "I am no expert on this, but within Korea for instance, it is noticeable that their culture is already very focused on mobile 3G applications. It is in their nature to always be searching for new things to try out; particularly Korea is – from this respect – four years ahead of us in their usage of new media" (idem). He expresses his concern for the lack of this attitude in the Netherlands: Dutch users are more likely to focus upon the performance of the telephone only. If the phone is still able to receive messages and incoming calls, then, the Dutch owner holds, why should she buy a new phone? "They are not that eager as Korean people to try out the latest developments. But this is also the reason why we want to be accessible to less expensive phones: especially within the Netherlands, it enables us to reach out to a big audience" (idem).

Within Layar, users from countries all over the world can scroll through the 'augmented web', which has been made easier through the implementation of a content discovery engine called Layar Stream, and find layers that support them in many different ways. Wikipedia gives the user a helpful basket of knowledge factors, but she can also experience the fallen Berlin Wall, or create content, such as seasonal greetings. An example of the latter is the Eastern layer where users can lay eggs for others

to find while adding a seasonal greeting (see chapter four). Although the application is not necessarily a navigation system, Layar does redefine mapping principles, for one gets to know one's environment from *within* the image – rather than experiencing an top view image – an image that is, moreover, mobile and therefore (inter)active, thereby stressing the moment of the here and the now with up-to-date information *about* the here and the now. What Layar eventually strives for, Groenhart adds, is to optimise these experiences within the moment, which can be achieved by taking more parameters into consideration that define the moment. "For example", he explains, "a user is standing outside on a rainy day and looks for a nice restaurant. Wouldn't it be great if we could optimise search requests by taking the weather into consideration, finding a lovely indoor restaurant? Yet to think of the opposite, during a beautiful day, the application could suggest some of the most fine-looking places to enjoy one's drinks or lunch" (idem).

This technique has also been referred to as Web 3.0 – the next to follow after Web 1.0 and Web 2.0. Clearly, it must be recognised that this is just a metaphor only, which includes teleological assumptions that assure a certain improvement and radical change. However, as media theorist William Uricchio already emphasises and will be demonstrated in the following paragraphs: "change is relative" only (2004, 162). What however is important here to register is that this type of mapping specifically concerns user experiences with a special demand: to please the user as much as possible. Consequently, rather than the mass being at centre, the user herself becomes the commodity: with her actions she is able to personalise that which has been provided to the mass. This "different logic of post-industrial society" is what media philosopher Lev Manovich refers to as individual customisation (Manovich 2001, 30). Within different applications – such as Microsoft's Bing Maps in which users' photographs (to take just one example) become part of the map – this behaviour has become the rule rather than the exception. It therefore causes a rethinking of Wood's distinction between the material and the cognitive, for the two clearly cannot be dialectically separated as they are in direct contact with each other. As explained before, the user is the central point in this thesis, approached as a modern performance cartographer. Here, a first step is provided to refine Wood's definition that focuses upon the process of individual customisation. Individual customisation, or, to put it differently, regarding the user as a *bricoleur* of her own experiences – and perception – stresses the participative role of the user within this type of cartography. The following section will describe this process in more detail, by first explaining how the technique behind Web 3.0 evokes such behaviour to then give a detailed account of the user's position.

SEMANTIC MAPPING

'Web 3.0', 'The Internet of Things' or the 'Semantic Web'. As Web 2.0, these terms are used as a metaphor to refer to a certain way of doing, a specific way of organising information and basically, a way of living. Related to technology, the semantic can be understood in principles of personalisation, and consequently appropriation for the act of individual customisation ideally enables the user to connect to (more) points of personal interest. Increasingly, systems are designed in such a way that they learn to learn what ones preferences are and 'hope' to be a step ahead of one's thoughts by offering the user the right information at the right time. But in order to really understand the semantic web, one should go back to 1673 where the philosopher, scientist and mathematician G.W. Leibniz presented the *calculus rationator*, a device that attempted to show the mechanization of reasoning. Although Lardner concludes that "it does not appear that this contrivance…was ever applied to any useful purpose" (Lardner in Lister et al. 2009 [1843], 108), Leibniz was described among many as the father of cybernetics. The desire to capture human thought with technology was again expressed by

Vannevar Bush – seen as the ancestor of the concept of the World Wide Web – in 1945 when he stated that it would make much more sense to structure information in the same way humans make associations. He states: "All our steps in creating or absorbing material of the record proceed through one of the senses – the tactile when we touch keys, the oral when we speak or listen, the visual when we read. It is not possible that some day the path may be established more directly?" (Bush 1995 [1945]). The desire that is expressed by the metaphor of the semantic web, then, seems to be another effort to embed human thought and association into the web of technology.

According to the World Wide Web Consortium (W3C), the semantic web concerns two things. First, it is about the creation of universal formats to incorporate and merge data from a variety of sources. Related to Layar, one can comprehend this as follows. The technology itself is already a combination of various sources of information: GPS technology combined with locative recognition of that which surrounds the user. But while zooming in, an interesting perspective pops up. While looking for a supermarket, for instance, one is not only just given the possibility to see where it is, but also to plan a route through using Google Maps. More interesting, however, it would become when one is also able to call the supermarket, see user-specific advertisements, add a shop list that guides the user through the supermarket telling her where she can find all the products she wants to buy, or even to be able to see whom of her friends is also there – to just name a few options. It therefore entails the usage of more than one parameters to determine her search results. This brings me to the second element of the semantic web: it also concerns the relationship between data and real world objects. Therefore, it is not just linking documents to each other, but rather connects entire databases to each other to 'personalise' traffic systems that humans are always surrounded with (W3C 2010).

The semantic web, consequently, makes mapping a more personal activity, not only because information is more user-centred, but also because the user becomes an important factor for creating the content; a topic that will be discussed later on in this chapter. The desire of Layar is that information is not just linked to each other by chains, but by being about the same thing: it is related to each other because it shares similar content. While discussing this, one must however bear in mind both utopias existing around the metaphor and conditioning structures that rely on this technology (see for instance de Vries 2005). Although it seems that the user is in control, she is at the same time shaped by her choices: looking for a vegetarian restaurant *makes* her a vegetarian for the system. But maybe she just wanted to enjoy a vegetarian meal or did she enjoy the company of a vegetarian friend. Despite these other options, rather than being a vegetarian herself, she will be put in a category stating "vegetarian". She is thus being conditioned, as Kattenbelt would say (personal conversation 2010), her actions creating the conditions under which she functions as if she loses her own fluid state of personality and exists of categorised layers only. Although the technology hence tries to label its user to provide more customised service, the structure also enables a type of mapping that will be called rhizomatic, as inspired by Gilles Deleuze & Felix Guattari (1987); which makes it at the same time actually harder to categorise for the traces that are left behind are not always easy analysed and do not go without mistaken judgments. Cartography – the act of mapping – within Layar is then characterised also by a 'bricolage'-attitude, in which the user brings various elements together – a type of behaviour that might not be as traceable or definable as one would assume.

From such a viewpoint Layar is distinguished by its mapping activity within which not a map is constructed to specifically navigate through surroundings, but a map to navigate through *emotions* and experiences of users, emphasised by Groenhart when saying that Layar is an application to *experience* one's surrounding (personal conversation with Groenhart 2010). Van der Klein insists: "Augmented reality is a great interface to 'consume' experiences that have a relation with the physical

world" (van der Klein in Cameron 2010). As De Certeau (1988) described walking as an activity of appropriation, it is here argued that this type of mapping – the act or process of making a (mental) map – has to be seen within a similar spectrum of thought. Mapping is, most of all, an activity in which humans define their surroundings and abstract it into something else, something that represents, but becomes more than a representation only. It becomes an object in itself through which – again – others determine their paths. Furthermore, it is argued that mapping is a rhizomatic (appropriation) activity, in which several layers of information are connected and reconnected to each other. The following lines will explain this line of thought, and provide a basis for the upcoming chapters where the relationship between the *map as experience* and its user will be further build upon.

MAPPING AS A RHIZOMATIC ACTIVITY

To demonstrate how mapping within Layar is to be understood as an experience evoked by a rhizomatic structure within Layar, the act of mapping will be divided into a couple of subcategories. The first level contains the act of looking, in which the gaze of the eye takes in a central position. In this particular case-study, the 'eye' both entails a human and technological nature, for the eye of the user interacts with the eye of the mobile camera. The human eye, in particular, is characterised by its swiftness in movement and reaches a field of 180 degrees of gazing when correctly performing with the other eye; together they are able to quickly scan their environment. The eye is mostly used when getting familiar with a new environment, providing us with feedback about street names, buildings and colours. The eye of the mobile camera on the other hand cannot move on its own, but needs a little help from its user, pointing it at directions and giving it the possibility to close the eye for a moment to turn the moving image in a visual representation of the user's memory forever. It also gives the possibility to zoom in and out, to record the moving image and to add extra information to that which is seen with the biological eye. The purpose of gazing in this context is mostly to orient oneself, to determine where one is and to then focus upon what one's next move will be.

Orientation through gazing has to be seen as a rhizomatic activity, first, because it connects one point to another, without any specific purpose or similar component. The Points of Contact (POC) – by Cartwright et al. (1993) described as "the ideal method for data/information/knowledge transfer" (6) – are connected to each other by the rhythm of the gaze, and are consequently heterogeneous: brought together by the lines of the eye, "for it does not select within a certain category (e.g. linguistics), but relates to everything possible to relate with. [..] A language [for instance] is never closed upon itself, except as a function of impotence" (Deleuze & Guattari 1987, 8). These connections together are analysed by the possessor of the eyes and are used to create meaning out of a specific situation. It is a continue process, yet, not a singular act: when interrupted, they will form a new path, a new line of thought, and a different dimension. And every single gaze could be the starting point of a different dimension, therefore multiplying itself without being aware of it. The gaze has, as the rhizome, no point of beginning and no point of ending; it is a continuous stream of perception characterised by its capacity to transform.

Deleuze & Guattari specifically mention that it is not the trace that matters, but the environment that is created through the trace: the map. "The map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. A map has multiple entryways as opposed to the tracing, which always comes back to the same" (Ibid., 12). It is the environment through which one navigates that determines a path. The second level within this type of mobile mapping then, contains the act of navigation thereby creating a path, described by Groenhart as the act of getting from point A to point B. According to him, navigation specifically implies to "go

somewhere" (personal conversation 2010). Within Layar, he argues, people usually don't use it to go somewhere, but to just experience what is around them. But then how to understand navigation within Layar, through a broader set of ideas? Is it really simply sufficient to say that navigation entails the act of going from one place to another – both within the application and in the physical world? Take, for instance, a very common type of navigation humans are – generally in welfare states – very accustomed to use in this digital media era: GPS systems such as TomToms one can find in cars. With a click it turns on and presents the user a couple of options to choose from, one being going to pre-set addresses. The user then selects an address and the system calculates a route for her to take. Other than following the directions the system describes to her, the user's role is fairly small in the process of actual navigation. In this example it is namely predominantly the technology that performs the act of navigation. From a user's point of view, the act of navigation, then, means to trust the technology and act upon it when it says to take a certain direction. So navigation now becomes not the act of getting from point A to B, but *taking* directions that takes one from A to B. But is such an analysis really enough to understand the concept of navigation? Deriving from the Latin word 'navis' (ship) and 'agere' (to steer), navigation does indeed imply taking a certain direction, however, knowledge forms its ground to define these directions and thus constructs mobility. This can be also be identified as 'orientation', as has been previously discussed, but furthermore entails the act of *experiencing* the process of navigation. Increasingly, the latter gains more attention – specifically art-related – within emo-mapping projects.

Take Christian Nold, according to his own website "an artist, designer and educator working to develop new participatory models for communal representation" (Nold 2009). In his book *Emotional Cartography: Technologies of the Self* (2009) he demonstrates that journeys visualised through technologies appear to produce very emotional experiences. This is illustrated by the following text deriving from his own personal experience:

> From talking with people who tried out the device, I was struck by their detailed and personal interpretations of their bio-data. Often we would sit next to each other and look at their track together. While I would see just a fairly random spiky trail, they saw an intimate document of their journey, and recounted events which encompassed the full breadth of life: precarious traffic crossings, encounters with friends, meeting people they fancied, or the nervousness of walking past the house of an ex-partner (Nold 2009, 5).

Hence navigation is not only going from point A to B, but is – maybe even more than was originally assumed – an emotional matter too. While walking through the streets, people continuously create meaningful experiences, thereby attempting to appropriate surroundings to make the environment they walk through understandable to their own abilities.

A purpose of navigation, it follows, is that of mobility within the realm of *territorialisation* and *de-territorialisation*. Generally – or culturally – this has been defined as "going from point A to B", but when taking a closer look at it, movement within several dimensions becomes an act of power to understand spatial dimensions. Deleuze & Guatturi explain this through the following: "There is rupture in the rhizome whenever segmentary lines explode into a line of flight, but the line of flight is part of the rhizome" (1987, 9). Related to navigation within Layar, this line of thought suggests that ambiguity is central to the rhizomatic structure of the act of navigation for there is no single structure one has to follow. In creating her path, the user territorialises the environment – signified by the map –

in which the environment becomes deterritorialised as the user becomes part of its entity and alters it, at least, through her presence. But the process goes both ways: the environment reterritorialises itself through stating its presence and thereby influencing the user's attitude. Is the user then part of the surrounding, or is the surrounding part of the user's experience? Such questions are, according to the ideas of Deleuze & Guattari, redundant: they *together* form the heterogeneous network of interactions, the rhizome in which the *act of transformation* becomes crucial. It has earlier been explained that Layar deals with emotions and experiences first. Through interactions with the personal and public sphere, the experience of the Layar user is constantly subjected to the power of transformation: by trying to understand the experience – and to create meaning out of it – the mind of the user is constantly thrown back and forth (grasping, understanding, misunderstanding) between experiences.

However, to define the interrelationship between the two as rhizomatic is not sufficient to state ideas about appropriation principles – which forms one of the core principles of the performance cartographer for the act of spatial navigation requires a relationship (preferable that of understanding) with the surrounding. The thoughts of Deleuze & Guattari make a beginning, but are not specific enough to make thorough conclusions. What will be shown however, is that this rhizomatic structure becomes central to the possibility of users to create meaningful entry points (POC's) with the mobile application and thus to create a perception that becomes meaningful to them.

To do so, I will go back to the basis of the rhizome, namely its mobility, and relate this to the attitude of the user. Marilei Fiorelli, Andre Lemos and Rob Shields – leaders of a locative art project called SUR-VIV-ALL – suggest three dimensions of mobility, that are here found significant to appropriation: the physical/spatial (transport), the virtual/informational (media) and the cognitive/imaginary (thoughts, religions, dreams), in which the act of mapping has to be understood through a desire to get control over space. Within these forms of mobility, they state that three different possibilities of actions exist, this being replacement, complementariness and addition (comment posted on the website of Andre Lemos 2008). Although it is implied by the team that the three actions can be separated from each other, the distinctions are more likely to illustrate the different levels on which the act of mapping in terms of appropriation operates. To however comprehend the role of the user in terms of appropriation, this desire of control in combination with the attitude of the user offers an interesting perspective to understand how the user might create meaning out of Layar as a mobile mapping application.

PARTICIPATORY CULTURE OR CULTURE PARTICIPATION?

> WE KNOW THAT MAPS ARE CONSTRUCTIONS, IDEOLOGIES REPRESENTING THE WORLD AND SERVING THE CONSTITUTIVE POWER. TODAY, WITH THE INTERNET AND LOCATIVE MEDIA, MAPPING CAN BE USED TO REPRESENT PEOPLE, COMMUNITY AND A MORE LEGITIMATE SPACE AND PLACE THAT SHOWS HOW PEOPLE SEE AND FEEL THEIR ENVIRONMENT. WE HAVE A BOTTOM-UP PROCESS OF REPRESENTING THE WORLD, UNMEDIATED BY THE INSTITUTED POWERS
>
> (Fiorelli et al. 2009)

First, let me focus on the *attitude* of the user in terms of physicality, virtuality and the cognitive – the three dimensions of mobility that Fiorelli et al. describe. Considering the point made in this chapter, it will only be defined within the realm of participation to explain the role of the user within this type of mobile mapping – chapter three will focus more on the interrelationship between the physical, virtual and cognitive. When considering the form of mapping described in this thesis – and also, the metaphor of the semantic web – it appears that the role of the user becomes significant, as she

becomes actively part of the process of mapping, thereby responsible for any map-related activity. To however avoid the ideological connotations associated with terms as 'active' and 'passive', media theorist Joost Raessens (2005) describes three kinds of participation with regard to media utterances that are very useful in this respect to show how the three dimensions of mobility contribute to participatory culture. Although Raessens specifically deals with computer games, his division appears to provide a functional approach to understand appropriation possibilities both on a cognitive and material level, an important distinction that is also encountered in Woods approach that forms the base of this thesis. Raessens distinction entails three levels of participation: deconstruction, reconfiguration and construction.

To start off with deconstruction, Raessens explains that this level entails the process of interpretation – a notion to appropriation principles that has become popular from the 1980s (Hall 1973; Fiske 1987). Raessens: "The term, a central notion in the work of the French philosopher Jacques Derrida, refers to the method of interpretation that aims to bring to the foreground those elements that operate under the surface, but break through cracks in the next to disrupt its superficial functioning" (2005, 376). In other words, the term implies a cognitive interaction on the level of interpretation and the construction of meaning, an interesting process to which many have given their attention to. Although this stage consequently implies a cognitive process, performance cartography as described by Wood is more than just the act of interpretation: one interprets surroundings, creates a personal mental map and navigates through this mental map, basing her movements upon this cognitive state. Therefore, to describe it just as the process of 'interpretation' would underestimate the power of creating the mental map and acting upon it. This first level is, therefore, especially visible when *reading* maps, trying to understand what is presented and figuring out a way to react upon that information.

Reacting upon the map, and following the routes that are stated in the map, is the process of reconfiguration: although Raessens refers to it as "moving the pixels" (2005, 380), one cannot – when using a analogue map – move the pixels, but navigates through the representation that one has in hand. "Reconfiguration exists in the exploration of the unknown" (idem), thereby creating meaning back and forth when encountering new elements of thought. Secondly, when thinking of mobile cartography, such as navigation systems and specifically Layar, the user then is literally 'moving the pixels', yet she is not creating levels of representation herself. She is able to choose from several layers and to interact with them, thereby letting the physical and virtual intersect, and selects her own pathway through the supplied content. A fuller account of this process if to be found in chapter four, where the practice is described how the user interacts with the elements found in Layar in terms of collective and personal memory.

The manner in which Wood uses the notion of performance cartography, mainly refers to the third level of participation Raessens describes: the act of construction. Construction in Raessens' terms means to actually alter the environment, such as programming a layer, or adding content to the layer. Relating it to computer games, he states:

> If we look at today's computer games as a form of participatory media culture, we need to come to the conclusion that computer games are not only characterised by reconfiguration, but also, more or less, by deconstruction and by construction. [..] Thus, in my opinion, a more precise alternative for interactivity to characterize not only the specificity of computer games but also the media culture that has formed around them, is the concept of "participation" (idem).

For instance, during Eastern a couple of "Egg" layers were to be found, and users could lay their own eggs for others to find them, altering the layer's appearance. Although Raessens specifically refers to physical alterations, the act of construction can also be related to performance cartography as described by Wood. Navigation through the environment is namely primarily based upon cognitive constructions and decisions, therefore going beyond the stages of interpretation and reconfiguration only. In the early ages – without material devices to consult – one was explicitly bound to oneself: interpret the environment, move through it and create specific paths and routes. Navigational acts through surroundings are in this particular case based upon discoveries, and are purely constructed from information directly deriving from cognitive databases, translated into the construction of navigational patterns.

But what about the rhizome? How to relate the rhizomatic structure to these different gradations of participation and appropriation? The rhizomatic structure of Layar implies a continuous stream of connections to which the user can, at any point, make contact through her gaze, thereby creating new connections while using the application. Perception is consequently created through, firstly, the way these connections are made. It has been shown that she can engage with the application through different levels of participation, which consequently influence the rhizome: on the level of reconfiguration – that is, navigation through the menu and layers – the gaze of the user is responsible for the different connections that are made. On the level of construction, however, her activity becomes slightly different: she now also becomes responsible for *creating* new connections for other users thus starting a new rhizome. This distinction is also – yet in a slightly different way – encountered in Raessens article, stating that there is a difference between participatory culture and culture participation. While culture participation refers to the general idea "that we participate in the surrounding culture, be that in a passive and consumptive, or a more active and productive way" (Raessens 2005, 383), participatory culture refers to the latter, "more active attitude" (idem), in which the user performs special demands concerning the interpretation, reconfiguration and construction of the media artefact. According to Raessens' argument, these 'special demands' are, more than ordinary 'demands', extraordinary because it requires a critical attitude towards the medium – both cognitive and physical. From my view, I would like to slightly change this assumption, stating that participatory culture entails that part of culture that actively shapes it and determines its boundaries. In this thesis, then, participatory culture refers to those who *create* cultures within Layar – not by the act of following, but by the act of constructing the parameters in which culture participation within Layar is made possible.

The last stage of the circle (looking – navigating), then, becomes the stage of (inter)action, where the user becomes actively (physically, cognitively, virtually) involved with the application and therefore the act of mapping: she interprets, redirects, refines and adds information to Layar. I now reach the level of mobile mapping principles that are characteristic to Layar. Placed within a historical background, it is noticeable that the cartographer is now not just a person – or technique – that stands far away from the actual user; I here refer to the much debated process of convergence (see, for instance, Jenkins 2006). But within that same process, it must be recognised that, among others, companies provide the parameters or shape the conditions that users interact with, thereby dismissing many utopias focusing upon the leading role of the consumer. As the reader might have noticed, it has become clear that cognitive, physical and virtual dimensions are not easily separable when it comes to defining the participative role of the user in the Layar experience. Continuously, the three dimensions overlap and interact which creates possibilities for the user to meaningfully engage with Layar.

However, the upcoming chapters will reveal more processes central to the creation of this perceptual experience within Layar, thereby focusing upon the technology, the body and the intersection with other cultures, but my main goal in this chapter was i) to stress the role of the user and 2) to show that cartography within Layar is to be seen as specifically a rhizomatic and emotional experience.

THE PERFORMATIVE CARTOGRAPHER – PART 1

Within this chapter a first trait of mobile mapping principles within Layar has been presented in which attention was paid to the matter of cartography, and, moreover, the role of the user as cartographer within Layar. An answer to this issue is given by approaching the user as a bricoleur in her mapping activity in which she also becomes (partly) responsible for the experience, and hence, the way she is able to perceive her surroundings. Focusing upon appropriation possibilities of the user, it has been shown that the rhizomatic structure carried out by the application enables the user to actively engage with Layar. Material cartography as thus described by Wood, appears insufficient when taking the role of the user within this type of mapping into account. Therefore, it is here suggested to take on the perspective of the experience of the user in which it has been stated that she is actively involved in the act or process of making a (mental) map, which enables her to experience and navigate through her environment. Hence, the first refinement in Wood performance cartographer is the role of the user when interacting with a material device: the material device, too, enables her to activate a rhizomatic structure that lies at the heart of map-related activities to create a meaningful relationship with her surroundings. The next step for further analyse, then, is to study Layar's performance capacities to provide a better understanding of the performative character of the (user as) cartographer – both in terms of reliance and believability through the staging of Layar in front of its user and vice versa. Such an analysis would not only explore how exactly the rhizome becomes meaningful, but also concentrates upon the ontology of *performance* cartography, therefore foregrounding and providing further explanation about the concept of performance. In his article, Wood does not clearly define why he chose the word performance over, for instance, cognitive, which might have better suit his definition, especially when taking the current discourse regarding performance into account. It is therefore crucial to focus more upon the performance, and embed the performative – that of which a performance consists – into the map-related discourse presented in this thesis.

CHAPTER TWO: THE PERFORMATIVE

WHICH PERFORMANCE?

MCKENZIE 2001, 95

WHAT is performance? Such a question Jon McKenzie might have asked himself before writing his book *Perform or Else: From Discipline to Performance* (2001). Among others, he noticed that the concept of performance is being used within various disciplines, with different (ideological) connotations, and, consequently, that this concept only appears to be meaningful when it is embedded within a certain set of ideas. Where chapter one discussed cartography, this chapter will focus upon the performative to explain how the performative cartographer within this thesis should be understood. Due to the aim of my argument, two out of three disciplines McKenzie recognises the performance to operate in will be discussed in this chapter: technological performance and performance within cultural studies. Together, these frameworks will show how both Layar and its user are to be seen as performative entities. Moreover, the chapter will focus upon the interrelationships between the two, thereby taking the writings of theorists as Bruno Latour into account, and it consequently aims to analyse the network of interactions they together create within a mobile application like Layar. Such an analysis becomes interesting for it researches the interactive relationship between the technology and its user, thereby focusing not upon the *role* of the user, as chapter one did, but how the interrelationship creates a believable experience. Hence, it examines what 'performance' within performance cartography means, making clear how it can be used with regards to mobile mapping applications.

TECHNOLOGY PERFORMS

In the discipline of applied science, performance is often seen within the realm of competence; not related to the skills persons have acquired, but that technologies have: it takes processes of operations, executability, and effectiveness into account. In order for technologies to perform successfully, they usually are described as being *reliable*. Both among engineers and technicians on the one side, and users on the other, certain expectations are raised due to this character trait: by pressing *this* button, *that* – whatever that may be – is most likely to happen.

Most likely, because technological performance is, above all, characterised by its empirical trial-and-error construction. Predicting, prototyping, empirically testing, and making modifications: it is the circle which illustrates the learning-by-doing philosophy carried out by engineers to adjust products (McKenzie 2001, 115). Their evaluated actions are based upon the feedback the technology, performing the procedures constructed by the engineers, returns to them. The process of performance within technological disciplines is therefore continually in a state of feedback, between predictions and the actual effectiveness in a given task, with the objective to eventually implement the technology into society, and hence to create an actual *use* for it. Within some projects however, actual testing in physical environments appears to be impossible (think of missiles) and engineers therefore have to trust on the performance the computer supplies them with. Consequently, it not only shows that the computer performs as a tool to create new performances – in which the computer itself is already operating as a performative entity – the performative qualities of the computer is, additionally, used to make decisions for these technologies that cannot be tested in physical surroundings.

What becomes clear throughout the previous paragraphs is that performance qualities from a technological point of view are usually expressed in terms of *effectiveness*, or, as McKenzie puts it, through "the ability of the system to provide the services the community expects" (2001, 119). Within this definition, two different aspects are to be recognised: the first concerns performance measurement – testing whether a technology meets pre-determined criteria – and the second performance evaluation, in which measurements are evaluated within the light of various contexts that form important aspects to consider before implementing the technology. This includes elements such

as costs, safety and quality; performance within applied science therefore ranges between political, societal and technological dimensions (idem). However, considering the aim of this thesis, only technological (in terms of effectiveness and reliability) and societal (in terms of confirmation) dimensions will be discussed.

SOCIO-TECHNOLOGICAL EFFECTIVENESS IN LAYAR

Feedback, reliability, and effectiveness: how does the technology within Layar performs itself in front of the user? Although the question implies more than technological performance only, it will be dealt with firstly before discussing other implications. Several prototypes have been created, the first official and downloadable released in early June of 2009. I speak from my personal experiences with the HTC Tattoo, and after visiting the market place on this smart phone and downloading the application, the program visually notifies me of it being ready to use. I navigate through the phone, and click on that which has "Layar" on it. Let the game begin.

From a user's point of view, the application takes a pretty long time to load, on average a rough 3.0 seconds. This already raises some questions ánd, moreover, expectations: this either must be a very functional, yet demanding program – for it has to load a lot of data – or, on the other hand, one could start assuming that the application does not work that well yet. Not taken into consideration here, but, naturally, the loading time also depends on the performance capabilities of one's phone. Compare it to using a computer: the speed in which an Internet browser starts up firstly depends, roughly said, on one's processor, secondly on the code used in the browser, and, thirdly, on one's usage of the computer. So in the end, there are actually a lot of processes that run in the race to determine CPU (Central Processor Unit) speed qualities. Here however, a twofold of options is chosen that appeared to be most common in user experiences.

Then: the program has loaded itself; the user visually notices that somehow the application has turned on the camera – a clear example of *performative* feedback. Probably familiar with the concept (and if not, the camera evokes this behaviour), the user holds the camera up into the air, pushes some buttons to find the area where she can choose from different layers, and selects one. To get an idea, see Figure 2, where a layer has been chosen that displays tweets around the user. To come to this state, a couple of technologies are working together at the same time to give the user the information she demanded. GPS technology ensures a rather precise estimation of her location, made possible by receiving signals from at least four different satellites. It is through this technology that her physical location is translated into 'the eye' of the camera. A little map in the right corner of the screen virtually visualises her position, putting her in the middle of the circle and showing the items within a pre-set radius of the circle.

FIGURE 2: '3D TWEETS' LAYER

Linking several databases to each other through an Internet connection enables her also to see specific information about not just where tweets were posted, but also what was posted by whom and the opportunity is given, for instance, to immediately react upon it. From a romantic viewpoint, it is more or less comparable to sitting outside in front of your house on a bench, and chatting with your neighbours – whom you might not even know – while they pass by. Only the difference here is that this 'neighbourhood' can be expanded, just as much as the user wants to. It is, therefore, through the

notion of spatial proximity that people are 'brought together' (an interesting study concerning this subject is, for instance, Rice & Aydin 1991).

However, a piece of hardware one has to have in order to even see the changing environment would be a compass. GPS technology only gives the user an approximate idea of where one is, but in order to determine the specific direction one is headed towards, the phone needs a compass. Like an old-fashioned compass, where the arrow rotates when the user does, the phone can now separate northern from southern directions. Next to GPS technology and a compass one needs an Internet connection, ranging from generation 2 to generation 4 (among others GPRS, EDGE, UMTS or HSPDA) in which the latter provides the fastest connection. The Internet connection makes it possible to actually download Layar and access the variety of layers available to the user. Through this connection packages are sent back and forth, containing up to date information concerning for instance new Twitter messages that are twittered nearby the user's location. Information offered to the user is thus *changeable*.

In this enumeration the most important technologies – next to the basic tools that are nowadays standard on mobile phones – are named that are necessary in order to successfully work with Layar. But there's one other element that the user has to have: a camera. The camera, to be precise, becomes the eye of the user: the eye through which she can experience this mediated and layered world. Together, these technologies *perform*. In the sense of executability first: the user expects an application to work without problems and assumes things to react when she interacts with it. She expects to receive a certain rate of *feedback*, in which the program responds to her actions. When she moves the camera, she waits for the mediated vision to change – continuously to what she perceives as being in front of the image. In doing so, she is determining whether the technology performs to her demands, which is an important aspect in defining the specific performative aspects of the technology. This is what has earlier been referred to as performance measurement: testing whether the technology currently meets pre-determined criteria and therefore performs 'correctly'. While talking to Interviewee B, she remarks that Layar is very easy to work with, but does not always performs as she would like it to, which she explains through the following: "I regularly get the information concerning a previous visit, which is not what I want to receive when I signed up for a new visit" (interview 2010). Here, clearly, a discrepancy evolves between what the program does and what the user wants. Nevertheless, she is very positive in her final verdict about Layar: "Although the information is not always up to date, it does lead me to cash machines and entertains me during dull moments in the train" (idem). Interviewee A agrees: "In the beginning, it looks just like an application that is 'nice to have', but when you really start using it more often, it becomes rather an addition: it supplies you with specific information that you've asked for" (interview 2010). Although they were pleased to see that companies like Funda.nl participated in the project, all interviewees found that there were too little layers to experiment with.

When considering these other parties (such as companies) participating in the project, this is not only to be seen in the light of performance measurement, but moreover falls into the spectrum of performance evaluation, for designing a code that enables various parties to participate demands a consideration about issues such as safety, costs and quality (McKenzie 2001, 115). But, as earlier said, if I would discuss these issues too, the text would lose its focus upon performance cartography. Nevertheless performance evaluation will be discussed in the light of staged memories, as through the implementation of databases from different companies, such as Hyves, C1000, Twitter and Funda.nl a platform is created where various types of information within a certain range of the user are made accessible. Literally, one here navigates through a spatially performed information database – but

more about this is to be found in chapter four, where a comparison is made with Giulio Camillo's theatre of memory.

Up to this point, only the economics of technological performance within Layar are discussed in terms of measurement and effectiveness. But the interaction experiences of its users reveal another type of performance that is also responsible for the specific experience: technology does not just perform in its methods of operation, but also as a cultural actor by its presence. Imagine, again, the navigation pattern through a spatially performed information database as explained in chapter one. Users see and recognise the data and interact with it, thereby attributing a *personal* meaning to the experience. The technology itself consequently presents itself to the user and hopes to find satisfaction and acceptance from its viewer. This is what is referred to as the cultural viewpoint on performance, and, as will be shown throughout this chapter, is also dependent upon technological performance capabilities of both the user and Layar to together create the experience in terms of performance cartography.

I NOW PRONOUNCE YOU MAN AND WIFE..

..is a common example to explain the performative trait within linguistics that correlates with the official event of now belonging to each other for eternity. However, it can only be done through the actual pronunciation of the (performative part of the) sentence, in which the performative does not describe but *performs*, thereby immediately referring to its own context, and hence creating a truth we embed in our reality (Carlson 1996, 59-60). A performance, it follows, can only be successful when all participating parties are willing to accept the performative value, that is, providing the necessary authority the performative needs in order to be regarded as such. To illustrate this, an example of a theatre visit will be employed. Bearing in mind that it is a performance only, the viewer is the one sitting on the side of the audience, giving the entertainer space to perform. The performer on the other hand, accepts that she is the one leading the performance but often offers the viewer (or the audience) possibilities to intervene, for instance through applauding. To successfully create a performance, both parties thus have to *accept* this first cultural – and performative – 'rule'; it is an act of social confirmation. In other words, as Peter Simmons states: "once situations are defined as being real, they are real in their consequences" (2003, 79). But this reality is not defined by those who engage in the situation only, but, moreover, by pre-existing social practices and norms, which is why *rituals* gain a lot of attention in the field of cultural studies when focusing upon performances. In such studies it is argued that the social context is crucial to describe the performance's determining influence (Butler 1990; Carlson 1996; Culler 2000). The performative's determining influence is therefore defined by the specific social context which builds upon mutual agreements.

The process described in technological performance is, yet in a slightly different way, also recognised in cultural performances. To understand this, let me go back to the concept of feedback. Sociolinguist Dell Hymes sees the performer as carrying out a "cultural behaviour for which a person assumes responsibility to an audience" (Hymes cited in Carlson 1996, 42). Although this thesis specifically concerns Layar, rather than a person, it is argued that Layar too 'assumes responsibility to an audience', namely the responsibility of reliability. When the user starts up the program, the program responds with a visual logo of Layar – it thus provides the user feedback in saying: 'hey, you have chosen this program to start up'. Through posing itself in such a way, it literally stages itself in front of the user, stating its presence and asks the user to believe in the performative utterance. The user, who judges the performative value through her own social framework, thereby looking for confirmation within the technology, provides – by accepting and interacting with the technology – the necessary

authority the performance needs in order to be regarded as such. Hence they *together* create the mapping experience through the act of confirmation.

ACTOR NETWORK THEORY

Now, what has been discussed so far reminds me of much debated 'theory', or more precisely, a theory about a method, namely Actor Network Theory (ANT). Despite the criticism the theory encountered, which had much to do with "complexities that are lost in the process of labelling" (Law 1999, 9), the *method* brought forth through this theory proves a rather useful one. But the fact that a lot of its criticisers thought differently is mostly due to the interpretations given by them, so mentions John Law (idem). For yes, ANT focuses upon interrelationships between actors – in which no distinction is made between human and non-human – and yes, it defends a network structure carried out through the actors. But, as Bruno Latour himself clarifies:

> Now that the World Wide Web exists, everyone believes they understand what a network is. While twenty years ago there was still some freshness in the term as a critical tool against notions as diverse as institution, society, nation-state and, more generally, any flat surface, it has lost any cutting edge and is now the pet notion of all those who want to modernize modernization. 'Down with rigid institutions,' they all say, 'long live flexible networks' (1999, 15).

The network discussed in ANT however, is not to be understood as a path through heterogeneous elements without deformation, rather, one can bear in mind the nature of the rhizome as stated in chapter one: the notion of 'network' refers to a series of transformations made along the way. To therefore use ANT for studying phenomena, is in my reading to *describe* the complex interrelated transformations made possible through the net that entities perform in. As Latour states himself: it would have probably been better to use the word "worknet" rather than "network", for the former focuses more upon the construction of the net, therefore how the net of interactions (and thereby transformations) *performs* (Latour 2004). Then, from this idea on, actantiality is not regarded as the things an actor does, but which elements make it possible for the actant to act or think at all: "what *provides* actants with their actions, with their subjectivity, with their intentionality, with their morality (Latour 1999, 18). It is consequently a theory about a method to study complex matters within society – such as the interrelationship between Layar and its user.

Relating it back to Layar, it is definite clear that it is not sufficient to say that the user is the central point of action, as is neither the technology – but neither are they together. Rather – and this is what will be discussed in the upcoming chapters too, taking the body and memories into consideration – they are exposed to each other's *worknet* of transformations, which forms a new net of transformations when interacting with each other. Just as has been demonstrated by the rhizomatic structure of the gaze, the performative interaction between the technology and the user creates uncountable new traces in which a continuous stream of transformation provides both entities with actantiality. 'Performance' as in the concept of performance cartography has then become a complex process of unique interrelationships that together create the experience at a given moment, and shows to include more than Wood's reference to a 'cognitive database'.

Now, let me return to *reliability* (or responsibility) and *social confirmation*: the two core concepts of performative behaviour. When looking at the latter, the concept of rituals plays an important role, for it

are rituals who guide the user through the visual graphics Layar presents the user with. For instance, had the company not programmed the logo of Layer while loading the program but instead programmed a function in which the user could type text messages only, the user would probably have been confused – at least, when the developers still would have claimed that Layar presents layers to the world only. The logo that is now presented before being able to navigate through the program, overlaps with methods used in other programs in their starting up phase. Sometimes a progress bar is encountered, sometimes it is visualised through dots, and on other times it is envisaged through 'breathing' visuals (attempting to simulate the heart): all these methods imply a waiting process. Because users are already familiar with this concept, and are able to understand why ("it's loading, it's doing something"), they are willingly to accept the program's behaviour and wait. And just as they expect, a few moments later the program is ready for use. It is here noticeable how the relationship between the performative value of both the technology and the user together provide the user with a *perspective* on how to respond to the loading image.

This process of social confirmation continues when users navigate through the program, and while doing so, continuously update – and confirm – these conventions. Being social creatures, users are able to voyeur other people in their tweets, videos or locations. They want to be part of a social environment, and it seems that they continuously want to be remembered of that. But Layar also confirms the desire of humans to know: Wikipedia clouds are to be found anywhere and give detailed information about specific areas. Through imbedding these 'new codes' – navigating through environments while using the camera – into well defined social structures, the application is more likely to gain acceptance from the user (Winston 2003).

'Assuming responsibility to an audience.' Literally, Layar takes a responsibility in indexicality: when the user sees a dot, it refers to a specific location where that information is supposed to have a relationship to. The user, on its turn, can easily verify this information by walking towards the location. When the information corresponds to that which has been exposed earlier, the user will – again – find confirmation in the responsibility Layar presents. The represented dot appears to actually refer to something in their physical surroundings, thereby confirming an old tradition in our relationship to visual images: the thought that what is presented on the picture actually stood in front of the camera. Although humans are aware of the fact that digital images can be manipulated, they are still very likely to believe that what is represented also actually occurred in front of the camera. When it is revealed that photographs in news papers or 'quality' magazines such as *National Geographic* were digitally manipulated, great discussion aroused about its news value. News papers, so it is argued, should show 'objective' reality and display only those pictures that *re*present an actual reality. In the same way does interviewee B expects Layar to display information that have a direct relationship with her physical surroundings.

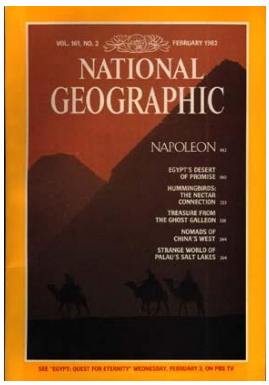


FIGURE 3: DIGITAL MANIPULATION IN NATIONAL GEOGRAPHIC (1982). TO FIT THE MAGAZINE'S VERTICAL FORMAT, THE GREAT PYRAMID OF GIZA WAS DIGITALLY MOVED.

(see more examples on http://www.cs.dartmouth.edu/farid/home.html)

Again, note here the complex interrelationship that provides the user with agency, for the elements she can react upon all come from very different sources. Additionally, transformative capacities can be recognised: if the dot, stating specific information about – seemingly – a certain location, and that information appears not to match with its physical 'counterpart' (as the user assumes), then perception of the user would be adjusted and therefore influences the way she would respond to the program. She might doubt the program, or treat it as an artefact without having

an indexical relationship to the physical world. However, how her perception would be really altered, is, again, dependent upon other elements that influence her. But, one must then bear in mind the rhizomatic and complex structure that goes along with it, for the influences themselves are constantly subdue to the process of transformation too.

To try to clarify this a bit, see the drawings presented in Figure 4. Although a fixed shape is used here, with a clear demarcation, it must be noted that rhizomatic structures cannot be seen within certain shapes, or even fixed shapes. Figure 4 only demonstrates an example to clarify the process of transformation. The first triangle already shows that connections are never to be seen loose from each other, and that is it therefore difficult – or impossible – to define a beginning or endpoint, for there is none. Think of the triangle as the shaping of perception: at a given moment, the worknet of transformations, looks like the first triangle. However, subdue to the act of transformation, characteristic to *each* line (!) the worknet can take a total different appearance just a moment later. And on a third moment, the connections that provide the user with agency, might again be changed (see triangle three). Hence, due to both difference in connections made, but also transformations within connections themselves, perception on the side of the user is likely to vary at different *moments*; a topic that will be discussed later on, but appears to be significant influence to the creation of agency.

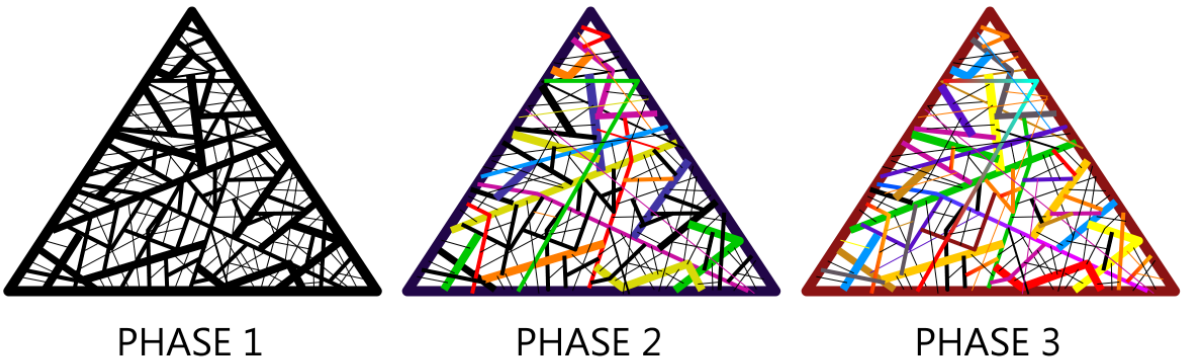


FIGURE 4: WORKNET OF TRANSFORMATIONS

Seen from this perspective, technology too performs as 'staging itself in front of an audience'. Through providing active feedback to the user within visual terms mostly, the user gives the technology feedback by its willingness to participate in the experience. The cultural performance is consequently still narrowly related to technological performance in the form of results. Moreover, Layar places itself in what Bert States calls an 'intentional space', where Layar lifts itself up to a certain viewpoint in which a perceptual change is triggered and the consciousness 'slips into another gear', allowing the viewer to see Layar as a 'signifying, exemplary image' (States in Carlson 1996, 40-41). By operating on this performative level, Layar's desire is not just to understand and follow human association, but also to become an application which delivers concrete results that users consider as being useful.

But as has been demonstrated in both chapters, it is not just the technology that plays a part in the creation of the Layar experience. Users too contribute to the experience, by interpretation, reconfiguration and reconstruction. It is the user who has to, firstly, hold the camera, thereby familiarising with the corporal literacy that is necessary in order to successfully perform the experience. Users, then, too perform in front of the phone by taking in a certain role – the role of participatory voyeur – and discovering environments. Moreover, without the performance of the user, the

application loses its value. The previous chapter also stepped upon the possibility for users to create layers themselves, again a form of creating agency through performance: not only in (technological) achievement and results, but also in creating ways of how to experience the application. In this way, cognitive information is translated into material artefacts, by which the performance is not just fictional anymore, but becomes something which is also possible to experience by other users. Both chapter three and four pay attention to this subject, revealing how performance cartography within Layar is to be seen as an act of personal movements. But for now, I want to focus upon the notion of 'the moment', crucial to the act of performance and discuss the participative role of both the technology and the user in this respect.

PERFORMANCE IN THE HERE AND NOW

Up until now, both Layar and its users are defined as performative entities that together create agency, within a technological (achievements, results) as well as within a cultural (acceptance, ritual) framework who are both 'intruding' and mingling with each others worknet. Considering the act of mapping, then, it here too is argued that agency is created through its performative activity, for the act does not describe but refers to its own context while doing (performing), thereby immediately creating a truth that is embedded into reality at a specific moment. Mapping, therefore, has to be understood as the theoretical outcome of the continuous performative interaction between the technology and the user; it is here where cartography (the act or process of mapmaking) reveals it performative nature. The images Layar shows and the reactions of the user on it, demonstrate that both actors are willingly to accept each other presence as being 'real', thereby provoking consequences on future actions. Believing the fact that the dot – representing a supermarket – actually is a supermarket, the user asks the software to calculate a route towards the location while she performs (walks) that route (this altogether being the performative mapping opportunities provided by Layar), illustrate that the performance refers to its own context (the process of navigating) while updating (perceived) reality.

Performance cartography, Wood argues, is based upon performances directly deriving from cognitive databases, but in this chapter, a first adjustment is given to this definition. Performance is not related to cognitive processes of the human mind only, but moreover to appropriation principles as the basic goal of Layar is to provoke meaningful interactions with regard to the user. The performative nature of the interactive relationship between the technology and the user is then responsible for the way users can appropriate the experience (which is here discussed in terms of agency). In his distinction, Wood mentions that material cartography should be regarded as distinguished from performance cartography, because of the intervention of a device (or paper) which already displays environmental information. The user, so would it appear in his argument, is thus excluded from the process of mapmaking, which makes it not a process of *construction*, but *interpretation* only (Wood 2003, 112). It has earlier been stated that the act of *mapping* is to be regarded as performative, in which the act of (co-)construction forms a crucial entity: without "the other" there is nothing to be confirmed at all. Through Layar a shift is marked in mapping performance, from just cognitively reading the map to actually having to move the device in order to gain new information about environments. Reading the map has therefore become a physical activity, in which both the physical and the cognitive constructively work together (see chapter three).

To this point, performative mapping has been actively related to the act of *construction*. The next step, then, is to understand this type of construction within its moment of duration (crucial to experience): the actual moment where notions of space and time become relevant. Within Layar, this is

demonstrated through the following. Being a mobile application, Layar actualises spatial dimensions because it first captures reality as the eye of the camera perceives it. This image is literally a window to the world, which emphasises its subjective character. Space is now doubly represented within different windows – a topic that will be further discussed in chapter three – and is characterised by its fluid identity: if the user moves her hand, the image will follow her movements. On top of the camera image, layers are placed – noticeable through their differences in coding, static and fixed character rather than being fluid and organic. Space, therefore, is accessible through multiple ways in just one moment – something which has been also referred to as the spatialisation of time (Kattenbelt 1999), where time is extended by spatial entities.

Through this understanding of time the user is given more possibilities to interact with the map and to extract more personal meaning from it. The ability of showing different layers of information consequently affects the personal experience of 'the moment'. Within that moment, the user not just experiences one representation of society within Layar – seeing the physical world and its virtual variant – but experiences three layers of reality: the physical reality, reality represented through the eye of the camera, ánd the layer the user choose to navigate with. Within that one moment, the user is confronted with her own 'hereness' by several layers who also present what is found to be 'there'. The latter issue steps upon the concept of indexicality first, but also on looking in a certain way, where the here and now overlap. These concepts however will be further discussed in the next chapter.

I have now clarified the spatial dimension within the moment (the here in the now). But what about temporal factors seen within a spatial dimension (the now in the here)? Taking the work of Marshall McLuhan into account (1964), it is explained that devices such as railways and cars inevitable lead to a changing perception of time. For example, travelling from Groningen to Terneuzen (a trip of approximately 360 kilometres), both cities in the Netherlands, currently takes one around 3,5 hours by car. Travelling by public transport will add up another 1,5 hours; in total it would take one now 5 hours to reach the destination. It might seem a long time to kill, but compared to horse wagons – or even before that, just by feet – these machines decreased travel time and consequently give a different interpretation to the concept of 'distance'. The now in the here is therefore partially determined by the way humans understand the now in terms of space: it now takes me a couple of seconds to talk to my aunt in Switzerland, where in early times it would take me a week at least to deliver a letter.

Additionally, when looking at the way how locations in today's culture are determined, it turns out that GPS systems – crucial to the experience Layar offers – cannot operate without adding a temporal dimension to it. To compute a specific location, a GPS system communicates with four different satellites. Each of these signals is stored by a microprocessor and measured by its length, width, and height on the specific time that the signal is sent. The microprocessor however, also stores the time that it received the signal in order to calculate how long it took the signal to reach the system. The difference between the time of sending and receiving is then crucial: through applying mathematical calculations with the speed of light, the system can determine the distance between itself and the satellite. By repeating this process four times (four satellites) the system can accurately calculate its current location. This construction represents two things. First, seen within the light of the previous paragraph, locations are not only experienced as being 'closer' to each other – as the concept of 'distance' has grown smaller in terms of time – but locations are currently also available to a big audience, who can visually retrieve their exact location with a snap of a finger only. Within the same era, both the 'there' and 'here' are emphasised through the development of advanced technology. Secondly, it is emphasised that space cannot exist without a temporal dimension, it thus being a spatialisation of time. Consequently, time can be regarded as an actualisation of space and vice versa.

But how to understand these general statements within the creation of agency through a performative mobile mapping application like Layar? The following section will show that time in terms of experience forms a significant element in creating the cartographic performance.

BERGSON ABOUT THE NOW

According to Henri Bergson (1888-1922), time can be split up in two categories: homogeneous time, and heterogeneous time. The first, he continues, is not time as it really is, but it is how humans have tried to capture time. He compares this type of time to a clock: it is characterised by its discrete numbers and calculations. It therefore does not capture time as it actually is, but describes it through the use of numbers that lay close by it. According to his view, homogenous time is then actually a degree of spatial activity, for space too, can be captured in quantitative and discrete ways only (Bergson 2002, 59-64).

Heterogeneous time, then, is the way humans actually perceive time: sometimes it appears to fly by, sometimes it seems to last forever. Time is thus to be seen within the light of biological factors. He discusses this through the concept of durée (duration), which is the psychological and physical manifestation of the passing of time. Four elements are crucial to his argument, namely dynamic continuity, succession, heterogeneity, and survival of the past (memory). Firstly, heterogeneous time is continuous yet dynamic, for the different states that the consciousness experiences, are succeeded and incorporated by each other and thus form, as it were, a continue stream of consciousness. Succession exemplifies the sequence of states; duration is irreversible. Through this, the different states acquire a past and future, thus carrying out the basic notion of how humans understand time. The present now, Bergson states, can only be understood as an actualisation of the past, present and future and this is why Bergson primarily values ´real´ time as a heterogeneous and qualitative entity. More about this actualisation is to be found in chapter four, but for now, space appears to be, for Bergson, subordinate to heterogeneous time. In other words, space is, in Bergson's view, an actualisation of time.

The reason why Bergson's argument is of relevance here, is because the notion of duration within Layar plays an important role. It must be notified however that here specifically appropriation principles – thus experiences – are taken into consideration, and from this viewpoint, the aspect of duration shows to be very useful. The passing of time is not just a succession of moments, as Bergson's critique on Kant reads, but is, moreover, a continuous development of intense (qualitative) states. This characteristic of being able to create qualitative, intense states is also what causes Bergson to state that duration is heterogeneous, as quality is by definition characterised by its subjectivity. Within Layar, space is that where the application is based upon: it unfolds representations and guides the user through a landscape of locations – again, see chapter four for further information with regard to this subject. Space is therefore a significant element for it determines the starting point of the experience. But time in terms of duration is what makes the application so interesting: the qualitative continuation of conditions that are continuously subdue to change and therefore influence the personal experience of the user. The notion of duration, then, is a useful addition when taking ANT into account, for the transformations are less noticeable through space than they are through time. More importantly is duration characterised by transformation in terms of the creation of the now (difference in qualities) and therefore determines for a great part the experience one gets from interacting with Layar. This is also encouraged by the fact that the user has the opportunity to immediately react upon what she experiences. The space presented on the screen is a snapshot of that location only, thus only gains meaning within the moment itself. Without the moment, that what was represented, looses it context

and therefore meaning. It is, then, time within space that creates a significant stream of agency to the user for it forms the 'starting point' (i.e. references) of interaction.

It needs to be emphasised again, however, that this relationship is specifically noticeable within appropriation principles, as the aphorism 'being in the right place at the right time' illustrates the cooperative activity between space and time. Within the experience however, and therefore the creation of agency at the side of the user, it is argued that time actualises space in such a sense that context becomes clear. Take for example an Alzheimer patient: without having some sense of the moment, the patient is not able to function at all. Literally is the way of how the layers are organised therefore a spatial elaboration within the actual moment. The mapping activity through Layar is, additionally, not just something one experiences through a top view, but by getting the idea that the user stands in the middle of the experience, as both time and place are visually reproduced in the application. This increases the feeling of duration where the illusion is created that the user is at the centre of the application, as all around her objects and spaces are present; she thus gets the idea that she is just another entity in this world of entities. But because she is interacting with the device at that specific moment where real-time images are connected to real-time information, appropriation is easier established. The technology used in Layar that aims to establish this experience therefore forms a significant factor that influences the way the user can interact with the technology and is able to create her own moment of duration.

To understand the performative as a whole one needs to understand what lies at its heart: time and space. For the performative can only function within a given time, and a given place, together creating the possibility for the user to engage with the artefact. What has been emphasised in this last section is that the notion of duration within performance cartography is of great value: it is again characterised by the intersections of 'where', 'what' and 'when', together creating the actual experience – which has here been discussed in terms of duration and (partly) the conditions under which agency is generated. For, as has been illustrated in Figure 4, agency is for a great deal a matter of duration.

THE PERFORMATIVE CARTOGRAPHER – PART 2

Earlier it has been explained that performance cartography relates to the act of being part of the process of mapmaking: in Layar the user is part of this process through different ways. Firstly, when taking notions of time and place into account, the user is literally pointed to the fact that she is standing within the playground of which the application relates to. Secondly, she becomes part of the process of mapmaking through being a constructive entity by performing actions that are made possible to the interactive possibilities between her and Layar. Lastly, the user can actively contribute to the map in Layar by creating a layer herself (see chapter four). Her performance however, is an interaction with the performance of the technology, both in its ability to successfully operate, as its ability to stage itself in front of the user. Performance cartography now not only becomes the cognitive process of performing spatial actions, but is moreover manifested within the realm of time and place. The complex relationship between the user and the technology that is created through this 'locativeness' consequently forms the actantiality of the user.

During this chapter, it has been argued that the process of duration increases opportunities to create actantiality, and hence to appropriate the experience. Within Layar, space is important – as it is the basic principle on which the application relies on – but it is through the notion of intensity and duration that the application becomes meaningful. As has been demonstrated in Schrandt (2009), spatial entities are not by definition necessary in order to appropriate the performance, for it is the

intensity of the moment that determines whether users feel like reacting to the utterance. Additionally, it has been shown how agency is created out of the performative nature of both the technology and the user, but, moreover, through their interactions with each other. The performative therefore appears to be crucial to the creation of actantiality which enables the user to perform her act of mapping. While Wood only referred to the cognitive state by his usage of 'performance', it is here shown that the act of performance – and the actions made possible by it – can i) not be seen as a individual act, and ii) is by definition not only a cognitive interrelationship either. Chapter three will centralise this problem of cognition and will argue, in a more detailed manner, that the body forms a crucial entity within the creation of action and perception too.

CHAPTER THREE:
THE VIRTUAL AND THE BODY

TO DESIGN A DIGITAL ARTEFACT
IS TO CHOREOGRAPH
THE EXPERIENCE
THAT THE USER WILL HAVE

BOLTER AND GROMALA 2003, 23

AS previously stepped upon, mapping is, foremost, an interaction between the platform from which the user derives its information from and the (physical) body of the user herself. Within performance cartography as is here demonstrated through Layar, this becomes an interesting relationship to further analyse, for it are the basic tools the user works with in order to perform the act of mapping at all. In the previous chapter it has been discussed how both Layar and its user form a performative entity and in the upcoming chapter, this relationship – again analysed as a form of appropriation – will be studied from the perspective of embodiment. Here, the physical body of the user and her mind are seen as inseparable elements that together create the experience of Layar, and thereby also highlight another important aspect within the concept of performance cartography. For the performance cartographer in the current time not only 'stages' herself in front of the technology, and vice versa, but moreover evokes a recurrent independency between the physical state of the user and the application. Perception is hence not just an act of the mind, but one 'looks' with the entire body. Additionally, the physical location of the user becomes crucial in this type of mapping, for it forms the starting point for the mapping application to gather information from. It are these points that will be centralised within this chapter, where it will be demonstrated that i) meaningful relationships can arise through both reflective and immersive qualities of Layar and ii) this relationship is by definition characterised by a multisensory stimulation. Towards the end of the chapter, it will then be shown how points i and ii can be related to the creation of agency that enables the user to build up meaningful interrelationship with Layar.

SCREENS AS CULTURE

Before however dealing with the relationship between the body and the application, a couple of questions need to be answered first. For starters, what is it exactly that the user is interacting with? Is she interacting with a technology? A cultural artefact? An environment? Or an interface? Although there are several ways to deal with Layar, mobile mapping applications are always characterised firstly by a screen to read the information from. Placing this within a historical background, screens take in a central place in contemporary media culture and are narrowly related to the image – that which appears on the screen. To describe screen culture, William Uricchio explains on his website, is to study "everything that has to do with the reflection, projection and emanation of images" (2009). In 1992, professor of Media Arts and Sciences William J. Mitchell recognised a shift in interest within academia that was referred to as 'The Pictorial Turn', a change in which the subject of investigation entailed understandings of visual literacy of the image in contemporary culture. Rather than studying it through linguistic approaches, they argued that, as society is full of images, new strategies had to be developed to comprehend these visual stimuli, as the years before had been characterised by linguistic paradigms (Boehm & Mitchell 2009, 105-6). A comparative line can also be seen within the development of television, where the first years were mainly characterised by content rather than form. From the seventies on, more attention was given to aesthetic principles, showing the medium's potential for visual stimulation, investigated through montage techniques and artistic utterances. Researchers started developing methods and theories to approach these visual stimulations, however, in 2005 Mitchell reviewed his statement by remarking that "all media are mixed media" (Mitchell 2005, 260), hence putting forth that images are never visual stimuli alone and always involve other senses too. It is for this reason why this chapter emphasises the screen in relation to the entire body, rather than visual stimuli alone. It is the screen that is perceived, but the entire body interacts with it.

This 'reaction' of the body will be touched upon later on, as first the screen itself needs to be understood within the realm of performative mapping principles. Screens, as 'spaces within a space',

are found all over in society. At the very moment of writing, I myself am surrounded by uncountable screens. Narrowing down the research subject though, and taking into account only those screens that are supplied with electronic power, I count – in my own living room – three screens: my television, my telephone and my laptop. Within those devices, I see screens inside those screens, almost creating a Droste-effect in which the original fades away. But screens are not only present in my private sphere. If I would walk up to the supermarket, I would again encounter several screens – most of them used as adversary items. So by just counting electronic screens in my direct environment, they appear to enter both my private and public sphere on a regular basis.

While the word 'screen' nowadays implies a technological intervention, it should be regarded within the realm of the window where on is able to *see through* and look *at* a predetermined shape – usually a rectangle such as one encounters in Layar. When taking this into consideration, the history of screens is not necessarily related to technological inventions, but to the tradition of the *creation* of images: cave painting, oil paintings, photographs and so forth. The history of screens is then related to the act of *drawing* – for which several tools are employed, such as the hand, followed by camera's (mirroring); hence the process of *creating* an image. Therefore, when interacting with a mobile mapping application like Layar, I am curious to see *how* the image is created, not by describing it from a technical point of view, but by focusing upon the effects it might constitute.

Although many approaches to analyse screen culture are at hand – linguistic, semiotic, sociologic, etc – Bolter and Grusin (1999) argue that there is one thing which they all share: the desire to seduce the viewer to believe that which she sees at a specific moment when looking at it. They explicate that images employ two strategies to achieve this goal: first, the strategy of transparent immediacy which strives for total immersion; the act of forgetting the frame. Hypermediacy however, strives to remember the viewer of the medium itself, it deliberately *shows* the frame. Although it might seem that this state remembers someone of her *looking at* something, hypermediacy's power is much stronger: it lets the viewer remember that she is indeed looking at something, but by doing that, she becomes even more immersed into the medium: what are its characteristics? How has it been made? For instance, appreciation for design can increase immersed feelings because of the pleasure it brings forth (Carù & Cova 2006, 11). Additionally, being able to play with the hypermediality – an example of this being YouTube, where the user can playfully click her way through the medium – can also increase enjoyment and a feeling of flow (Csikszentmihalyi 1999). What the strategies eventually strive for, Bolter and Grusin consequently argue, is a feeling of "stepping through the window" as Ivan Sutherland would have expressed it, and to become part of the experience. In the upcoming sections it will be illustrated how these strategies are employed by Layar to evoke a meaningful mapping experience.

REFLECTION AND IMMERSION

In this chapter, a couple of strategies will be discussed through which Layar – approached as a mobile screen – tries to connect with its user based on screen theory. First, this will be studied from a cognitive perspective only, focusing upon reflective and immersive qualities of the mobile map. Within Layar, the relationship between mediality and immediacy forms an interesting line of thought to understand how the user can interact with the medium. Building further upon previous ideas, Jay David Bolter and Diane Gromala (2003) state that: "[..] media and their forms oscillate between being invisible and visible – between being windows and mirrors" (Bolter & Gromala 2003, 34). In this section it is argued that both – the window and the mirror – provide 'entry points' for the user to build a meaningful and interdependent relationship with the application.

REFLECTION

WHEN MEDIA BECOME VISIBLE, THEY BECOME MIRRORS, REFLECTING THE WORLD AROUND THEM, THE CONTEXTS IN WHICH THEY FUNCTION

(Bolter and Gromala 2003, 34)

When considering representative qualities of the screen, the basis of virtual mapping applications is most often found in its physical counterpart, as the maps try to form a comprehensive layer on the physical world to guide the user through this material environment. It is hence to say that there exists a continuous tension between the world portrayed by the virtual application and the physical world in which the user operates. The mobile map visualises places as they would appear to the eye of the user, yet not in its actual form, but through codes, such as yellow lines signifying a highway and profile pictures signifying a specific person, emphasising its representative character. Therefore, by using these codes – or, in other words, strategies such as common conventions – the application becomes comprehensible for the user. A couple of examples will illustrate this relationship.

Although the impression is given that the user stands within the image, a reflective image is shown on the screen: a circle in which the position of the user always forms the centre (see Figure 5). Through this feedback the user is provided with a general overview of where information is to be found within a certain radius, thereby emphasising the user's central position in the application. This extra map forms a mirror for it deliberately focuses attention to the presence of the user and her perception, highlighting the fact that she is, literally, at the centre of the application.

The mirror-effect becomes stronger when the user holds the phone into the air and becomes aware of the translative qualities of the application: in front of her she perceives the world as it is, but when she looks at the image on the mobile phone she is confronted with its representative quality, thereby emphasising the fact: "this is an interpretation only, and you are looking at it". She is consequently able to reflect on the real world through the information given by the application, but also vice versa, making her aware of the mediality of the program and how it enables her to see things. When again looking at Figure 5, the mediality becomes clear through all the different screens or windows that are put together. The user is consequently pointed to the fact she is interacting with a mediating program, showing her the content that is flowing through the air, in which attention is also attracted to the fact that a lot of data can be easily accessed by the public.

FIGURE 5: 'TWEEPS AROUND (3D)' LAYER

The latter is also emphasised through the different layers she can choose from. For instance, let's focus upon another augmented reality layer called 'FlickAR Photos' where the user can perceive photo's `floating' through the air uploaded by flickr users in nearby surroundings. Layar users are not only confronted with their photos, but can also experience entire profiles of people. Although this information is also accessible through the World Wide Web, one is now easier connected with other flickr users through Layar as one would not search, in general at least, for people one does not 'know'. Hence, Layar first connects people by location and secondly provides a reflective viewpoint upon the nature of this information and its accessibility. The user is now not only aware of the mediality of the program – thus being aware of the fact she is interaction *with* a technology – but is also made aware of matters of public and private matters.

By navigating through the system, she is thus constantly remembered of its mediality: if she presses that button, this will happen. The technological performance emphasises the fact that she is interacting with something that she has to steer. In addition, the layers placed upon the virtual image of reality again remember her of the fact that she is interacting with a medium, as its design is not organic and fluid – for, it will be demonstrated later on, the camera images are – but rather fairly static and angular, which stresses the fact that it is a 'treated' and mediated appearance. The performative nature of this type of mapping consequently evokes a creation of awareness around the map itself.

As can be read from the quote at the beginning of this section, mediality forms an interesting aspect because it gives some insight into the circumstances within which the technology is placed. Layar demonstrates the desire to be within the image, but because it doesn't always respond in a way the user might expect – or, at least, what the user wants – it thereby also reflects that it is, for now, a desire only. Additionally, it demonstrates the current state of technology stating its ubiquitous character, be it still in its experimental phase. With the device in one's hand, one is aware of the field of technology she is standing in, as for instance she knows and sees that her device picks up a signal from somewhere near around her (visually signified by a emitting satellite dish). The information isn't created out of thin air, but is sent by packages through a complex technological structure. From any place in the world, one is able to request data from other sources, at least, that is the given impression by this technology. Locative layers however pay extra attention to the fact that this isn't always the case: they can only be perceived within a certain radius and different layers pop up on different locations. Through this addition, the exact position of a user in a given time gains extra attention: the local information at a given moment becomes the experience. Performance cartography as expressed by Layar hence becomes an activity that is to be seen as a discovery through spatial and temporal dimensions (see chapter four).

Through the metaphor of the mirror it is shown that the visibility of the medium shines a reflective light on the technology behind Layar. But the application not only reflects technological aspects. It additionally reflects social conventions – which, as will be shown, also form an important strategy to create believability. Currently being in a period where technologies become more tactile, Layar deliberately employs this technique to create a more user-friendly interaction. If the user sees something of interest to her, she can just point her finger to it and click on it. This is however an already common way of navigating through the screen, as her phone will have to have a touch screen to interact with the application, therefore having enough practice before starting with the program. Additionally, Layar clearly demonstrates the common desire of 'knowing' and the philosophy of a "life full of learning" that has become popular in today's culture: every new place brings new information with it. It is a way of living that humans are nowadays very familiar with: they want to know everything about anything and want to have access to this information without being bonded to strict settings, such as work or home. While travelling, people want to be up to date and have access to all kinds of information. Where previous mapping artefacts provided static information only, mobile mapping devices such as Layar now grow alongside the changing demands of society.

From the perspective of interaction with maps, Layar plays with conventions as the user can not only navigate through the program, but also add content themselves to specific layers. However, seen from the perspective of interactive possibilities on the Internet, users are already familiar with this concept of adding content. Conventions of the map are, accordingly, integrated with conventions of Internet developments. Through updating these conventions to present behaviours, Layar creates several entry points for the user to create meaningful interactions with the program. At this very moment, the location of the user forms the starting source for information, giving the opportunity to

reflect upon knowledge, people, photos and other kinds of information. Although this reflective mode attracts attention to the mediality of Layar, it is also a strategy to create engagement – for it is the medium itself which is at the centre of attention. To explain this train of thought, I would like to concentrate upon this process which finds its place in the spectrum of immersion. The next section therefore, will illustrate how such a state is achieved and examines how a believable environment is created that the user is willing to interact with.

IMMERSION

"I want to break the glass and go inside the machine." This famous statement, expressed by Ivan Sutherland (Sutherland in Lister et al. 2008, 113), illustrates the desire to connect the virtual and the physical, the virtual being an extension of the physical in which the movements within the physical world can be extended to the virtual. When thinking about Layar as a window, the user is able to (cognitively) step *through* the window – which in other discourses is also known as the magic circle or being in an immersed state. In this respect, the interface becomes the layer which functions as an intermediary to create *believability* on the side of the user.

In "Believable Virtual Environment: Sensory and Perceptual Believability" (2004) HyungSeok Kim et al. (2004) discuss the matter of believability in relation to a couple of factors (immersion, presentation and interaction). In their analysis, the matter of (semantic) consistency appears to play a significant role in creating a trustworthy environment, in which the act of believing the real can be either expressed through i) a world similar to what we live in and ii) a world where everything seems to correlate with each other. In short, the basic asset an application should have in order to have potential on the level of believability, is a matter of consistency – correlations that are easily understood while using and are logical for the user (Kim et al 2004, 1).

Within Layar, believability is first of all created by the notion of indexicality, indexicality originally being understood as the relationship between that which stood in front of the photo camera and the blueprint it leaves behind on the film, the light being the 'messenger'. With digital technology, the actual relationship between what was there and what is seen on the picture has become difficult for it, as I have demonstrated, has become very easy to alter the picture and to create something that was not originally there. However, it is striking to see that – despite the knowledge – humans are very likely to keep assuming that what is represented has an actual relationship to the physical reality. Layar skilfully uses this trait through relating the virtual to the physical first of all by connecting the fluid and real-time images of the camera to its layers. By using real-time images generated by the camera that derive from what the user sees with her biological eye, a bond of trust can be created: that what she user sees with her eyes correlates to that what she encounters on the camera image. The augmented layer placed on top of this image – take for instance dots that represent a supermarket – is then easily assumed to have a 'real' presence too. This trait of gaining credibility is especially characteristic for mapping and navigational systems, for users employ it as a tool to create meaning out of their physical environment. Moreover, users *trust* the technology used and believe it *will* take them there. This is affirmed by interviewee B, who stated that: "I often use it to find a cash machine, and it always works!" (interview 2010).

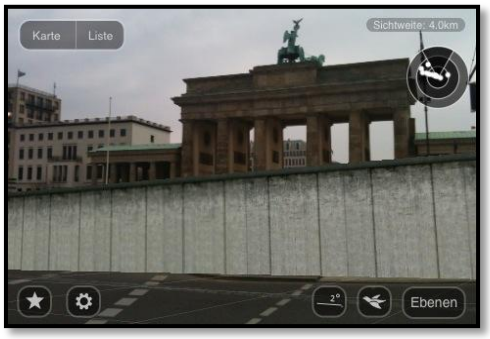


FIGURE 6: 'BERLIN WALL' LAYER

Consistency is here generated by logical correlations between what is perceived through the physical eye and that what is observed through the technological eye. But that is just one aspect of the application; the information given by the layer does not always correspond to an entity in the physical world. An example of the latter are the seasonal layers where, for instance, a digital Santa Claus can be virtually placed within the image, thereby adding elements to the technological eye. Other examples are layers concerning the Berlin Wall (see Figure 6) and flash mobs (Figure 7). These layers specifically form an interesting phenomenon, since the user perceives real images combined with information that is not visible in the physical world, presenting happenings that alter the experience of the actual moment. Consequently, the visual and locative information itself *becomes* the experience. In other layers the opportunity is given to add information, such as the Eastern layer that made it possible for users to lay eggs themselves, providing it with a greeting for other (unknown) users to experience. Adding this content is easy to do, in which the mediality of the program – being aware of the fact that it is an application the user interacts with – becomes part of the immersive experience: one applies the mediality to further build on to the experience.

FIGURE 7: 'FLASHMOB' LAYER

In the previous section concerning hypermediacy the matter of conventions is already discussed – through its hypermediate character one can filter out the remediation of conventions. It are, however, also these conventions that make it easy for user to appropriate to the experience. As Carù & Cova (2006) namely describe, users will always search for known elements to meaningfully make sense out of an experience. The more they experienced on a cognitive level that elements were disturbing the experience, or were unable to understand them, the viewers appeared to be less likely to meaningfully engage with the experience. This desire is expressed by Layar through offering real-time images with virtual layers that are created by interested companies ánd consumers themselves – therefore giving some tools to the audience to decide what the content is. Additionally, users are encouraged to share this content with their friends, thereby bringing locative and social aspects together. Both hypermediacy and immediacy are consequently characteristic to the creation of believability within Layar. This argument then functions as a base for the performative process within Layar, for as has been shown in chapter two, a mutual confirmation is crucial to the willingness of the user to engage with the mobile mapping application at all.

EMBODIMENT

Up until now, the matter of awareness and immersion within Layar is discussed in relation to cognitive entry points to the experience the user can meaningfully interact with. What, however, has not been discussed yet is the issue of the body in this process – as Layar specifically demands a bodily presence in other to function at all. This topic will be seen within the theoretical light of embodiment, in which the body and the mind are treated as always being interconnected (Deleuze & Guattari 1987; Vanhoutte & Wynants 2010; McLuhan 1964). What will be shown in the upcoming section is that hypermediacy and immediacy (the creation of believability) is not characteristic to the cognitive state of the user only, but moreover to the entire body. The performance cartographer then needs to use her entire body to successfully perform the act of mapping that is carried out by Layar.

CORPOR(E)AL MOVEMENT

Within a mobile application like Layar, the user also has to understand – and learn – how to use her body to meaningfully interact with the application. To navigate through the program she will have to use her hands as the program is based upon touch screens people are nowadays familiar with. Again, interacting with the specific layer also entails a haptic relationship, as the touch of the fingers provide the system with necessary feedback in order to react. As illustrated by Kim et al. (2004), believability of haptic interaction goes hand in hand with technological performance, for the user expects a certain reaction from the technology when she interacts with it. Factors such as exchange-data rate, response time and consistency in interactions – for example, pressing the button which says "menu" does not lead the user to her address book, but to a couple of options, such as settings, for the specific application she is now interacting with – play a significant role in believability when it comes to haptic interactions. If the program responds too slowly, the user might experience a feeling of disconnection and create a negative attitude towards the application.

The role of the body is not just present in its navigational steps through the program. The surroundings from which the device takes it information from are translated into moving images in the same way humans would experience while creating their own film: here, the entire body of the user is responsible for the specific viewpoint of the camera. With her hand, she holds her mobile phone into the air and with her body she determines the direction of the camera. For the user, then, this encourages a different way of experiencing maps than she had done before as usually top views rather than moving images from within the field are offered as again, the (participative) role of the body is emphasised. In previous settings this desire has already been expressed, such as GoogleMaps who hinted to this experience through its option of 'streetview' in which an illusion of a 3D experience is given. However, actual moving images within a real-time setting with a senso-mobile character is a trait recognisable in movies, series and commercials (think of VIPER (1994), 24 (2001) and AVATAR (2009)) but efforts to actually implement this desire in daily lives are becoming more common through applications as these.

To thus become part of the total experience Layar offers, the user does not only work with her (inner) mind, but includes her total body in the process too. In relation to appropriation, the application then, can be understood in two, interconnected, ways: 1) an experience in which one comes to understand and becomes aware of the program and 2) as an experience by the sensory organs of the body. Both have been here discussed within separate topics, but through the concept of *embodiment* they come together. But, while discussing these terms one needs to be aware of the fact that, as Vanhoutte (2010) explains, the concept has experienced some redefinitions ánd clarifications through the course of time. Opposed to *disembodiment*, the notion implies a distinction between the body and its embodiment:

> On a theoretical level, however, these (Platonic) dialectics could easily trick us into believing that there exists a kind of division between material reality as a 'live' condition and the simulation principle of digital technologies (Vanhoutte 2010).

However, when discussing virtual and physical matters as being dialectic we would misunderstand the complex relationship, Vanhoutte rightfully adds. In his book *Synthetic Worlds* Edward Castronova (2005) overcomes such a dialectic approach by focusing upon behaviour – how people interact with their digital surroundings – concluding that both the virtual and the physical are experienced as giving 'real' experiences. While showing how the virtual and physical are interwoven with each other, he

exposes that the concept of embodiment is more complicated than a clear distinction between the daily life and the virtual, concluding that: "our culture has moved beyond the point where such distinctions [between the virtual and the physical] are helpful" (Castronova 2005, 159). Castronova explains this through a psychological framework, in which it is the user's choice to react upon the digital and the virtual as if both have a comparable value (idem). He then launches the concept of a "porous membrane", where there is an "almost-magic circle" (idem) created by the endless opportunities offered by the synthetic atmosphere of fantasy, but in which "the routes between them and the daily life are too well-travelled" (Ibid., 160) and the virtual and the physical are, consequently, strongly connected to one another. This idea is underlined by Vanhoutte within performance studies: "The individual at the beginning of the 21st century is instead perpetually undulatory – in orbit – through a continuous network of embodied states of presence that are increasingly defined according to participation and agency, rather than physical co-present. The implication for digital performance is that the embodied self is extended, hybridised and delimited through technologies" (2010).

Within Layar, the world presented in the application (and its correlation to its physical counterpart) is, then, not experienced as something unfolding in front of the user, but rather, unfolds with the cooperation of the user – she thus experiences Layar from within. Visually this is demonstrated by the map as illustrated in Figure 5 where an impression is given of all the elements that surround the user, thereby emphasising the field *centred around* the user. It is therefore not only seen by the user, but, moreover, by the entire body, for the body is i) literally emphasised as being part of the experience made possible through the application and ii) not separable from the mind, for the mind and the body are, it has just been argued, always interconnected with each other. Creating meaning out of the experience, then, is moreover an embodied act, where the body plays a significant role in the creation of perception. It is for this reason why theatre specialist Maaike Bleeker uses the notion of 'corporeal' literacy, as it "points to the bodily character of these perceptual, cognitive practices and draws attention to the relationship between bodily practices and modes of thinking commonly with the mind" (2010). Hence, perception cannot be seen apart from the experience one has: it is through the embodied act of creating the experience that meanings can arise.

However, it must be recognised that a difference exists in bodily interaction when looking at projects such as Stelarc or Project Natal, where direct influences are performed on the total body. To take Project Natal for example, the movement of a leg is registered by technology and then translated into virtual movements of the user's avatar. Layar however, only reacts to hand movements and the balance and movements of the *entire* body as a whole, thereby not clearly separating different parts of the body. Secondly is immersion in this respect specifically related to the movements of the user's personal body, functioning as the platform from which all experiences derive. Therefore one has to bear in mind the difference of immersion viewers experience within artefacts such as films. As film theorists as Jean-Louis Baudry (1970) argue, immersion here evolves through a process of identification with both the film characters and camera viewpoints presented in the movie. Believability in Layar, however, is a matter that involves the entire body, its performance being partly responsible for the mapping experience the user has. In addition, the body *becomes* the centre of the given map, represented in GPS coordinates, and hence becomes a 'tool' to perform performance cartography. The following section will build further upon this line of thought.

THE BODY AS A TOOL

Thus far, it has been shown that not just the cognitive, but also the body plays a significant role within the experience of mobile mapping activities presented through Layar. Being able to successfully

perform mapping principles consequently depends on the ability to literally embody the application, in which the representation of the body – expressed by GPS coordinates – forms the starting point of the application. Focusing upon the metaphor of the screen, again, there are three things that clearly attract attention within this respect. For starters, the use of the phone demonstrates the necessity of the user in order to be able to experience Layar. The user not only *sees* the medium, but also has to physically hold it, thereby creating a haptic interdependence. The user is therefore not just cognitively reminded of the system, but also in the flesh. Consequently, the application makes an appeal to the entire body, therefore implying the notion of embodiment. But let's take a step further, focusing upon the entire body as a tool to create meaningful experiences.

"YOU DON'T WATCH TV, TV WATCHES YOU"

The previous paragraph implicitly stepped upon a fascinating issue, namely the extension of the human senses. Mobile mapping asks for a re-sensorialisation which Derrick de Kerckhove, director of the McLuhan program in Toronto, defines as a re-examination of our senses and its relationship to the things that surround them (de Kerckhove 1997, 179). Basing his ideas on McLuhan, he argues that communication networks enable intimate contacts between humans and, especially, a much more natural way of communication comes into existence that is based upon our natural senses (de Kerckhove 1996, 150). Although being 'guilty' of digital mysticism, de Kerckhove raises important issues to consider when talking about mobile mapping. Some of them, such as collective intelligence, will be discussed later on, but what matters most now is the way in which our senses are being *massaged*.

His statement "you don't watch TV, TV watches you" (1996, 13) illustrates how de Kerckhove defines media and its relationship to its client. Television is not just á way to perceive reality, thus proposing a window to see through only, it rather is "a window on the consumer" (Schwartz in de Kerckhove 1996, 14). The electronic signal massages the human brain, thereby questioning human agency and systems of thought. He gives an example of how television teaches the young child to comprehend the world by quick looks and thus determines the way that child will deal with other aspects, such as reading books or attending lectures (Ibid., 15). In consequence, electronic technology has the ability to shape and change human agency and thinking processes. This idea is also carried out by Sarah Ruhbidge, recognising the fact that: "It is increasingly being argued that embodied understandings of the physical and social environments that we inhabit underpin not merely our language (Lackoff & Johnson 1980), but also our modes of thinking (Antonio Damasio 2000; Gerald Edelman 2001; Lackoff & Johnson 1999)" (2003, 2).

The idea where devices can be seen as extensions of the human sensorium should be regarded within the light of this underlying belief. The hammer is not just an extension of the human hand, but it enables the human to build houses, closets and so forth. Mobile mapping applications like Layar also ask for a re-examination of the senses thereby literally repositioning the human body as it actively forms a part of the application. One's body is visualised as a dot on the virtual version of streets that surround the user. It is a virtual representation of oneself, almost like an avatar without any ways to personally identify oneself with it except for the locations that overlap thus giving the user a signal saying: this is me. Unlike the physical reality the user walks through, the virtual reality is easily adaptable by using one's body. By clicking through the menu using her fingers, she can add *layers* to the virtual variant, such as restaurants and shops which enables her to emphasise her actions within the here and now. Additionally, letting the device calculating a specific route colours the streets blue (usually) which the user interprets as the route to take. It enables a direct and real-time relation to

additional knowledge that one does not has at that specific moment, being able to access it at any moment and location. Being able to embody the technology – and vice versa – hence suggests that perception created through Layar is an act carried out through an interaction between the body, mind and technology, or, to recall Fiorelli et al. (2009), the physical, cognitive and virtual. It is here where the *corporeal* as described by Bleeker becomes relevant, as the embodied act of creating perception unfolds, by definition, within the occurring moment; it consequently creates that what is believed to be part of 'the real'.

This way of navigating through environments emphasises the here and now, but at the same time relates to the past (through accessing archived knowledge) and future (one's destination, for instance). Although this is not entirely different from navigating through environments in previous times without such devices – as the act of walking always includes the past (where am I going?), present (I am going) and future (when and how will I get there?) – it demands a different perspective on the act of mapping, which can be explained as follows. Both the present, past and future are directly retrievable and abstractly visualised through material artefacts, this giving the user direct feedback and the possibility to immediately response. A real-time connection emerges that offers a *reflective* perspective on the user.

But then the body comes into sight. Within the sphere of mobile mapping systems, the body takes on a literal role within this process. The system not just asks for visual input – that is, looking at the map and deciding where to go – but specifically requires tactile interaction. Seeing this in the light of a long tradition on reading as the highest good, a shift is noticeable from visual stimulation to a multi-sensorial stimulation in which the user is literally asked to re-examine her own body. Consequently, instead of a reflective mode operating within, for the most part, the visual senses, mobile technology asks for reflection that is centred around the whole body. It is through the usage of the hands, or, for that matter, the entire body that the system invites one to engage with it. Within the arts this is already a common development, where art sceneries are not just created to watch paintings or following instructions, but where the artistic experience is created through a bodily participation in the scene. A common example is Theodor Watsons *Funky Forest* (2007), where children are invited to play with a 3D digital created forest environment. Consequently, mobile technologies – and thus mobile mapping – let me think about relations between the human body on the one hand, and both technology and its environment on the other.

As de Kerckhove, my statements now seem to fall prey to the prophecy of technological determinism, implying that human behaviour is determined only through technological changes. I wish to emphasise that this specifically is not my aim, and acknowledge the fact that we always deal with a certain interrelationship between human and non-human actors. Although in this section the technological impact for the human body has been highlighted, I will also focus upon human interpretation and agency later on in this thesis. And although every new medium and/or technology that is accepted within society basically asks for a re-examination of our senses, it remains fascinating to analyse, not less because of its paradoxical nature. Regularly, mobile technologies are associated with physical distance, a concern that was also expressed by the Dutch royal queen during her Christmas speech of 2009. Ubiquitous technology would repel 'real' human contact and 'real' communication; it is what de Vries (2005) refers to as the 'myth of dialogue' telling us that "true communication is personal, free, live and interactive" (Peters cited in de Vries, 66). Nevertheless is it through mobile technologies that we are also enabled to hold "the world" nearby our physical body, carrying it within intimate spheres that humans would not even allow the other to enter, both on a cognitive and physical level.

THE PERFORMATIVE CARTOGRAPHER – PART 3

The ideas expressed in this chapter are of relevance to the notion of performance cartography because the performative act of mobile mapping through Layar is not just something "deriving from our cognitive databases" as Wood would say (Wood 2003, 112). Rather, it is an interrelationship in which the entire body is involved, which has here been discussed within the realm of embodiment. Moreover, it has been demonstrated how this relationship opens up discussion about reflective views upon that which is encountered, but also how it enables users to 'go with the flow'; not only with the world that is presented within Layar, but also with what is to be seen *next* or *behind* the Layar screen. The aim was to focus upon possible readings, and moreover, to show processes behind the creation of perception that is particularly an act of the entire body. More interesting is the fact that the world carried out through Layar is placed nearby our own body in artefacts such as bags and pockets, thereby literally stressing the physical need of technology. Through such redefined interaction possibilities, in which both technologies and corporeal literacy form significant elements in terms of creating agency, the performance cartographer can be understood as the core entity *within* a given set of elements: the performance of the entire body becomes the pivot point within the spatially organised map that is presented through Layar. Agency is hence created through the embodied act of performative interactions between the physical, cognitive and virtual.

Up until this point, the role of the user has been understood in terms of mapping (chapter one), performative capabilities (chapter two) and embodiment (chapter three), all being key terms when it comes to the type of performance cartographer here described. However, when looking at Wood's definition again, one gap is encountered: that of memories, for performance cartography, according to Wood, entails the re-enactment of memory. The last chapter, therefore, will focus upon the creation of collective and individual recollections, and examine how the two spheres intersect to create actantiality.

CHAPTER FOUR: THE MEMORY

WELCOME TO THE THEATRE OF MEMORY: THE COLLECTIVE AND THE INDIVIDUAL REVEALED

BASED ON GIULIO CAMILLO (1480-1544)

AS Wood proposes, memories form a significant element within the process of mapping: through the memory we can recollect where we are at the moment, but also where we have been, or where we are heading towards. Although Wood implies that only individual memory is of relevance within performance cartography, the aim of this chapter is to refine his statement in showing how both collective and individual memories form significant elements within the act of mapping. On the one hand, it will be demonstrated how Layar literally stages 'memories' – interpretations and thoughts that others (including machines) have left for users to experience. On the other hand, it will also be revealed how it activates the inner process of users' memory through recollecting, adding or changing perspectives.

To do so, the ideas of Giulio Camillo will form the leading thread throughout the chapter, which foregrounds the visual within a spatial organisation to activate and enrich memories. His 'theatre of memory' was consequently meant to visually trigger memories of spectators, thereby "staging memories by deploying a permanent set of images that were to provide a physical model for memorization" (Malkin 1999, 2). In this chapter, parallel lines are drawn between Layar – which also connects the user to its memories through visual stimulations in a spatial organisation – and the memory theatre as proposed by Camillo. Throughout this part however, the reader must bear in mind that all the information that is viewable in Layar will be regarded as a type of memory for the simple reason that whatever is stored, needs to be memorised first. More specifically is all the information treated as a kind of memory that is defined within particular cultural settings – so even the choice of using a symbol like a pushpin in Layar I argue operates within a broader set of cultural parameters. Eventually, the goal of this chapter is to show how the performative character of the application creates the specific Layar experience of the user. Interesting relations with chapter one pop up, for the rhizomatic structure of mapping will be here related to the way the user is enabled to determine her path through Layar.

DISCUSSING THE BASICS: TOWARDS A THEATRE OF MEMORY

Although the exact nature of Camillo's theatre remains unclear – "Was it an actual construction in wood on a life-size scale as some contemporary letters suggest or was it merely an enormous desk with mysterious shelves and secret drawers?" (1972, 48), Douglas Radcliff-Umstead states that one thing is clear. Camillio's desire was to combine encyclopaedic knowledge with what is called the mnemonic method of loci, in which the act of memorising is established by memorial stimulations through spatial relations. Moreover, Camillo's method to carry out his desire was even so striking: memories were to be activated through the associative capacities of visitors according to various visual images. His theatre was consequently an endeavour to revive knowledge through a complex and philosophical combination of images, based upon the eternal structure of the universe (Ibid., 50). Only through such a structure, in which knowledge was stored and awakened through visual stimulations organised in space, Camillo believed access to 'true wisdom' could be acquired. Although his aims were too complex for ordinary men to comprehend – for only scholars could grasp meanings out of the complexity of his theatre – and the dream to combine all the knowledge known at this period within one stage had failed (Ibid., 56), Camillo's theatre of memory inspired many artists, writers and scholars (Radcliff-Umstead 1972; Malkin 1999).

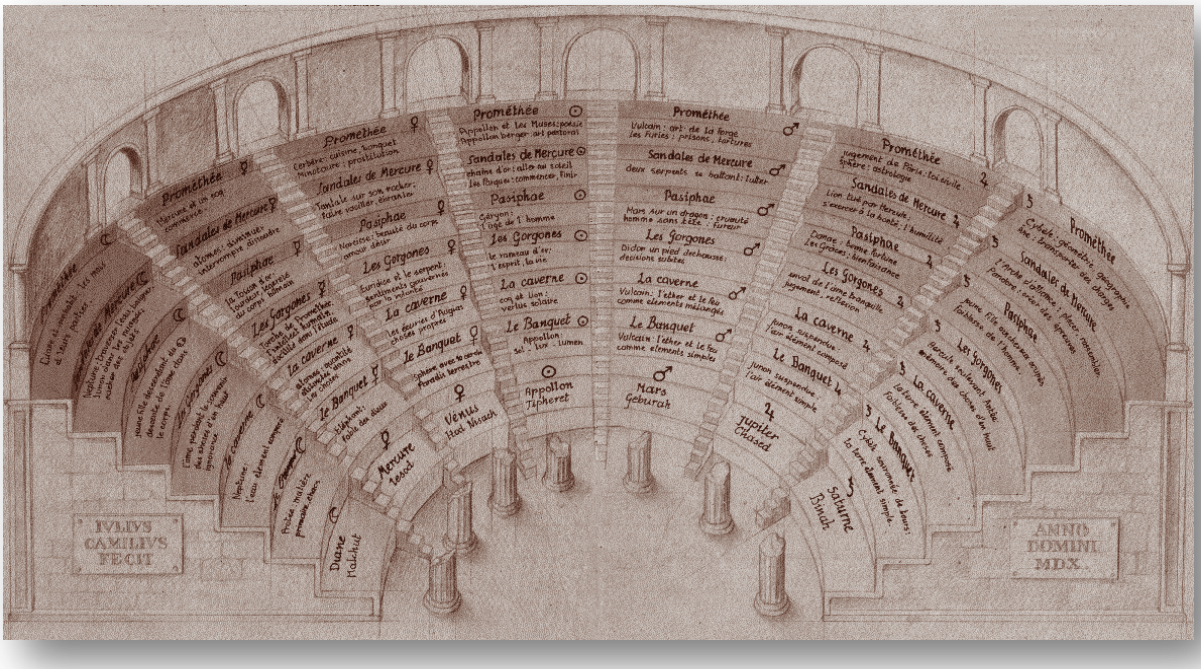
To understand Camillo's ideas, Radcliff-Umstead explains, one must be aware of Renaissance preferences for visual representations rather than discursive practices uttered by speech (1972, 48).

From their viewpoint it was believed that words could never capture the ultimate reality whereas images could embody abstract thoughts, thereby including a sphere within communication the word could never acquire (Ibid., 49). Camillo's goal for the audience was to understand his visual stage of memories through cryptic puzzles that could eventually probably only be understood by scholars who were able to get hold of the mnemonic images. "Based on the Roman theatre described by Vitruvius, the auditorium of Camillo's small wooden amphitheatre rose in seven levels divided by seven gangways, each of which was decorated with complex images drawn from Neoplatonic, Hermetic, Cabalistic, and Christian traditions" (1999, 2). The number seven formed an important factor within Camillo's work, for it represented the seven days of the creation of the earth. It is assumed that the viewer was not located on the tribune, as similar to regular theatrical plays, but that the viewer was at the centre of the theatre – hence were the stage should have been. From that location she was surrounded by various images spread throughout the theatre within seven different sections (see Figure 9). These visual stimulations were not to give access to – or to activate memories of – *one* universal 'truth', but would become meaningful through their interrelationship with the spectator, thereby giving access to enlightening wisdom. Although aware of the different readings spectators might have, Camillo hoped the audience would enjoy a feeling of enlightenment, by accessing preserved knowledge: ["]"This high and incomparable placing not only performs the office of conserving for us the things, words, and arts which we confide to it, so that we may find them at once whenever we need them, but also gives us true wisdom"– of what we cannot exactly know" (Camillo in Malkin 1999, 3).

FIGURE 8: VISUALISED 'STAGE' OF LAYAR

The proposal of a memory theatre suggested by Camillo and known here through the texts of Radcliff-Umstead and Malkin, form an interesting line of thought when taking the digital 'stage' that Layar offers into account. Or, to put it in different words: they seem to have a lot of elements in common. Although the information spread through Layar is surely not packed within complex and cryptic puzzles, at least, not for the user to experience, she however is surrounded with staged

FIGURE 9: THEATRE OF MEMORY BY GIULIO CAMILLO



memories from all kinds of categories. And where Camillo's goal was to enlighten people within terms of philosophical knowledge, Layar's goal is to "enrich the experience within a specific location" (personal communication with Groenhart 2010) to entertain the user, but also to provide her with helpful tools to explore surroundings and to create consciousness about both the technology and environments. Nevertheless both put the spectator at the centre of its 'theatre', be it in an actual (wooden) building or the streets represented in Layar through a circle with white dots (see Figure 8). And, probably the most important similarity: both provide the user with entry points (memories) that are organised through a spatial construction – thereby emphasising the role of the human body within the process – and are translated into visual artefacts to engage with the experience.

From this viewpoint, Layar could be understood as a platform that stages the virtual in the real through spatial organisation. It then becomes a mapping performance in which the user has to determine which elements will be put to the foreground. A couple of aspects become relevant in this respect, as for instance the newly improved search engine (Layar Stream) greatly determines the information that is visible to her. To understand this, one can think of a current Internet search engine: Google for instance uses page rank as a technique to organize web content. Layar on the other hand, uses a "proprietary algorithm that includes contextual elements such as one's location and the popularity of content in all published layers" (Layar 2010). This algorithm basically performs Camillo's function – that of mediator – between available information (the database) and information that will offered to the audience, except that, unlike Camillo, such an algorithm has access to a greater 'library' and can also pay attention to what the user wants. Again note here the performative capability of the technology that influences the way the user can behave. The user herself is responsible for *what* kind of information she wants to experience, however, the technology is responsible for *how* this information is organised. Different from Camillo's stage then, the information offered by Layar is known by its transformative character, as – it will be shown – users can choose from different layers that are easily updatable and vary per region. The performance offered within Layar is consequently subdue to a continuous state of flux.

In a more literal way than presented by Camillo's theatre are memories in Layar accessible by spatial movement. Visual stimulations are not just experienced from one angle only, but the user can walk – hence performing a spatial movement – towards a specific point to discover that now also other 'representations or memories pop up. More interestingly do the visual representations not step upon just one topic, as the mnemonic method of Camillo did, but are over 500 different perspectives offered where the user can *choose* from to engage with. Additionally are the memories not only staged i) in front of the user but around her and ii) is she (or her location) the starting point of the exhibition – and not vice versa as Camillo proposes. This is obviously related to the fact that enhanced technology enable these mobile 'theatres' – image what Camillo could have done with his ideas when living in the current timeframe!

The features here named – the participative role of the user, the fluid identity of staged memories and its locative character – are important changes in mapping activities and also reveal the relevance of the need of a re-examination in terms of performance cartography. The creation of a map in Layar is narrowly related to the performance of i) the user in terms of physical location and ii) the technology in terms of action and reliability. But now, another significant aspect comes into play: the performance of memory that makes it possible to perform the act of mapping as it provides the information the mapper acts upon. Put differently, analysing memory in Layar becomes imperative due to its ability to create agency.

The memory theatre here proposed by Camillo and related to Layar is consequently to be seen as the discourse from which the following is being interpreted: it is a digital stage that is dealt with here and the memories performing on it are entered through spatial movements and packed in visual (re)presentations. From here, it will be argued that the performance cartographer is not only dealing with intersecting individual memories (private-public), but, moreover, also with collective memories that engages with individual memories. Relying upon the discourse created by Emile Durkheim (1961 [1915]), Maurice Halbwachs (1992 [1925]), Jeffrey K. Olick (1999) and Bergson (1911 [1896]) – thus studying memory from a social viewpoint – a view is given that describes the intersection of these memories and places it within a network culture.

THE INDIVIDUAL, THE COLLECTED AND THE COLLECTIVE: MEMORY

To understand how memories become performative entities that are crucial in performance cartography, I will firstly define two core elements to which this chapter elaborates upon: collective and individual memory. These two types of memory are relevant for I believe that the experience provoked by Layar both includes collective and individual memories that intersect with each other. After having clarified my definition and relevance, I will show how Layar presents and (re)activates both types of memory in which it will become clear that one cannot exist without the other. Through such an approach, the working principles behind the memory theatre in Layar will be exposed which provides a crucial insight into the core process of mapping in general.

In "Collective Memory: The Two Cultures" (1999) Olick criticizes Halbwachs – who was greatly inspired by Durkheim, his teacher – for an unresolved problem he reads throughout Halbwachs' work. Olick speaks of a "tension" in Halbwachs distinction between collective and individual memory, the former being characterised as "personal" and "autographical" memory whereas the latter is typified through its "social" and "historical" character (Olick, 334; Halbwachs in Wilson 2005, 230). For Olick, Halbwachs distinction is somewhat problematic, for Halbwachs' idea of *collective* memory:

> indicates at least two distinct, and not obviously complementary, sorts of phenomena: socially framed individual memories and collective commemorative representations and mnemonic traces. The problem is that Halbwachs does not present us with an integrated paradigm that identifies the unique structures involved in each of these and shows how they are related – though he does provide some useful suggestions on all of these matters (Olick, 336).

To refine Halbwachs' distinction, and especially to clarify the term collective memory, Olick provides two basic frameworks to understand collective memory and the different methods each framework employs: collected memory and collective memory. Collected memory, he puts forth, is basically a collection of individual memories of a group, which involves psychology for an understanding of these memories. From this perspective, it is known that social frameworks constitute individual memories, but "it is only individuals who do the remembering" (Ibid., 338). Therefore, cultural artefacts such as signs and objects are not treated as having agency in themselves in the creation of memories: only the individuals themselves have something to add in this respect. On the other hand he proposes collective memory, which refers to Halbwachs' concept of "social frameworks [..]: groups provide the definitions, as well as the divisions" (Ibid., 341). Through studying the dynamics that groups altogether

create – and how it is also embedded within cultural artefacts – it is now possible to leave that which has only been constituted by the individual, thereby neglecting the frameworks in which the individual operates, and take knowledge of the whole environment that is (mainly) responsible for the constitution of cultural memories.

But the obvious appears now, a conclusion Olick himself makes too: although researchers have often 'chosen' one paradigm to study memories from, the collected and the collective are never to be seen apart from each other, for they continuously intersect with each other. In so doing, it constitutes an ever-changing entity which is always subdue to acknowledgement: the individual can add something to the collective memory, yet, for it being collective in the end, it has to be recognised as such by other members of society. The same goes for the group, or even for the object: if not taken seriously its proof existence might be lost forever. Collective memory, then, is here approached as an interchanging entity, influenced both by the collected and the collective as described by Olick, in which the latter form the always interacting entities that share the same element: it is a *public* and *culturally* defined memory.

The staging of encyclopaedic knowledge within Camillo's memory theatre – which, as earlier said, consisted of information deriving from Christian, Neo-platonic, Hermetic and Cabalistic sources – is, then, by definition a matter of cultural and public memory, for the observations are not based upon one perspective only, but upon shared believes brought together by the act of one person. The staged information within Layar is therefore here too approached as collective memory. But then what about the individual? Are her memories totally subdued to the collective, having no 'privacy' at all? The answer to that entails a complex process, but should not be difficult to address in its beginning: no. However...there is a 'but', and that 'but' involves the matter to which an individual is influenced by her socio-cultural environment, which in itself is a very complex matter and asks for a study on its own; although it is most likely that the answer to that question will remain a hypothesis situated within the nurture and nature debate. Therefore, it will suffice in this study to only demonstrate it through a couple of case-studies, among others concerning the Berlin Wall layer, through which it will be examined how Layar revives cultural memory through the mnemonic method of loci in site-specific locations.

RESTAGING HISTORY – THE BERLIN WALL

Within several museums, there has already been experimented with digital technology to enrich museum experiences through giving them more context. An example is given by the programme of The Centre of New Enlightenment at the Kelvingrove Art Gallery and Museum just outside London where a cinematic and hand-held-computer tour is developed to inspire young people.[1] The same idea has been carried out by the cultural layers available through Layar. For example, at April 16 2010 Layar announced the launch of a new layer focusing upon the Berlin Wall created by two layer developers named Hoppala and Superimpose. When standing nearby the Brandenburg gate, users can open the layer and (re-)experience how the Wall in Berlin looked like and where it was placed back then. Although the layer only displays a grey wall at certain locations, its content becomes meaningful through the specific location of placing. The same graphics would have a total different meaning when placed in China or Africa, and were probably – most likely – not directly associated with the Cold War. Memories are therefore strongly related to specific locations, for they provide them with the context memories need in order to become meaningful. This too is what Camillo strived for in his memory theatre, by organising his visual stimuli in such an order they would unfold a story to its viewer,

[1] For more information see the following link: http://www.artfundprize.org.uk/2009/shortlist1.php.

through which an interactive process could evolve that triggered the inner memory of the viewer, thereby giving access to 'true wisdom'.

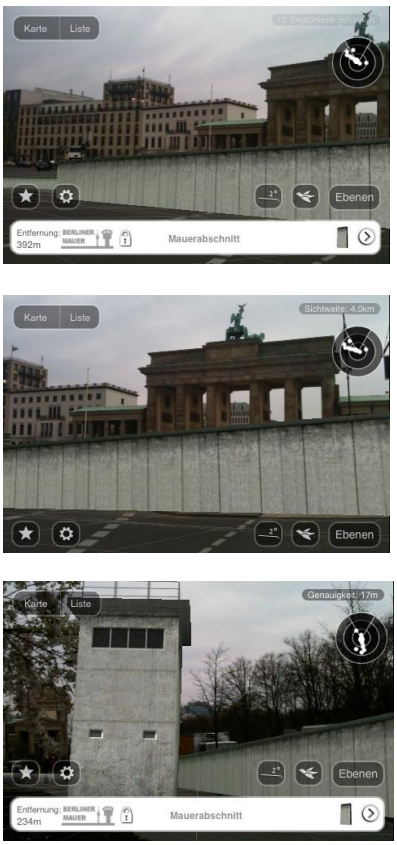


FIGURE 10: 'BERLIN WALL' LAYER

But, as Richard Terdimen points out, memories are not just objective recollections of specific locations. "Even memory has a history" (Terdimen in Malkin 1999, 4), thereby exposing that the nature of memories might be for the most part determined by cultural influences. It is not to be denied that all cultures rely on historical memories "but how a culture *performs* and sustains this recollection is distinctive and diagnostic" (idem). Here, Terdimen seems to refer to social habits that are common to people responsible for *how* memory is created and maintained by groups, thus emphasising its collective nature. Memories, such as presented in this case-study, cannot ever, therefore, be seen without cultural intervention. Commemorations expressed through various media – lecture books, radio, documentaries, movies – are interpretations of this historical event, but are always coloured; to get a full-detailed idea of how the event has been captured one would have to consult resources from different countries – at least including the United States, Russia and Germany and study the process of making of. In such a way, we would be able to map out conditions, thereby attempting to create a more objective kind of story, not representing one observer's perspective, but studying the different perspectives and cultures from which a situation came into being.

However, this collective image that attempts to provide a somewhat objective account is never complete without the intersection of collected memories, as the experience of the individual is of equal worth. For it is through the aggregation of the memories of the individuals it is known to us how life looked like during this time, and thus complement a collective approach of memory. Where Olick consequently states that the two types are contrary to each other, I however suggest rather the opposite: the collective constitutes the collected as much as the collected constitutes the collective, for the collected here provides points of engagement upon which the collective build further upon. On the other hand forms the collective an important part of the collected, as human behaviour is always imbedded within certain habits, which are, on its turn, for the most part determined by socio-cultural circumstances. Therefore, the staged memories presented in Layar never stand alone.

The grey image, therefore, is not just an interpretation of where the Wall had stand, but becomes a signifier to a broad set of ideas with regard to the history of the Wall (the signified) as described above. Moreover, the wall presented in this layer is not based on 'real' indexical relations: it is a simulation of the wall only, not in the first place because it does not resemble the real wall; there is no actual physical relation between that which stood in front of the camera and that which appears on the camera. This augmented image, then, acquires a paradoxical nature: the image of the Wall is perceived as a reference to *where* the Wall had been, yet at the same time it refers to nothing physical at all: through the physical location of the user it activates a chain of commemorations only, referring to a cultural set of ideas which offers reference points for the user to meaningfully engage with the layer.

Let me demonstrate this with a specific – yet purely hypothetical – example. Located in the heart of Berlin, attractive to millions of tourists each year, the site is easy to reach. To the young girl from Amsterdam, who has never been in Berlin before and only knows the history of the fallen Wall through her text books provided by school and movies such as *Good bye Lenin!* (2003), the staging of the Berlin Wall might give her the impression that the images are fairly right representations of how it must have looked like. As she has no inner recourses (i.e. experiences) to engage with the happening, she will have to rely on sources she experienced from outside – such as the lecture book. For her, the staged grey contours refer to a happening in the past, which she interprets within the present surrounding, imagining in the present lines of culture. The Wall then represents something that occurred in the past, not a threat for the future. To the elder woman however, who has lived her entire life in Berlin and experienced the Cold War in her younger days, this layer will most likely have a somewhat different effect. The grey stripe representing the Wall on specific locations will form a web of associations of actual happenings, experiences, and emotions. Presumably the grey area will be less likely interpret as being a copy of the physical wall, but will provide entry points for her to recollect memories. Her physical location in combination with the experience of the augmented image thus activates both her inner (primary, personal experiences) and her outer (secondary, experiences through sources such as media channels) memory – both reflected through the past, present and future. Being a citizen of West Berlin from her birth, she is well known with the cultural manners from that time, and experienced both fear and joy during the rise and fall of the Berlin Wall. Out of her own memories, she thus depicts some elements that appear to be meaningful to her, and engage with it. Therefore, each person will have different memories, associations and feelings concerning both the historical event and the location itself. It is obvious that these theoretical observations are perspectives only, based on one single person, and it is here we see the intersection of the individual memory: it is that which a person alone can feel and experience, that which cannot ever be part of the public sphere of memories. "It is a place seen by an observer, while a map shows a place that seems to exist independently of being looked at" (Davis 2009, 40). Although Davis talks about the geographical map, the history of the Berlin Wall too is not just something 'created' by one person; every story or representation of it will present a coloured version, yet the fact that the Wall was built in 1961 and collapsed in 1989 is a common belief.

This cultural set of ideas is what I refer to as collective memory: the memories that a group of people share together, which additionally offers opportunities of bonding: sharing similar experiences often forms a base for a feeling of 'togetherness'. Collective memory, therefore, does not entail 'one' shared set of ideas – they are shaped by many cultures, in many different locations and evolve through time. Consequently, collective memory does not exist on just one level: the Berlin Wall is a known fact to probably most of the citizens in the world. But it gets it specific shape through nationalities, values, socio-economical circumstances, and so on; hence its intersection with other collective memories, but also collected and individual associations. Different than Wood argues then, collective memory forms an important part of performance cartography for even the 'early' mapper based its actions upon a collective set of values – memory – that was characteristic for the culture she was part of. Although the conception of the present that is at the same time filled with a past and future forms an interesting line of thought – almost a form of time travelling – which asks for further explanation, first a couple of other examples will be discussed to demonstrate the cultural effect of intersecting memories and therefore to show the complex process of creating agency through memories in Layar.

'REAL-TIME' APPLICATIONS

An interesting aspect coming forth out of the Berlin Wall layer is that of the rise of the imaginary: the digital object is not really there but creates a simulated reference to its physical counterpart saying: 'here *was* I', activated by the GPS location of the body of the user. However, other layers within Layar that form the base of the experience refer more to the present moment in which it is suggested that memories are not reactivated, but, moreover *created*. Different strategies are employed to create this feeling, in which the user gets the feeling that she is actively part of the moment of creation. Relying upon theories demonstrated in chapter two, the creation of memories forms one (yet important) connection for the user to react upon the experience: because it presents itself to the user through a format of recognition, an interaction is established in which both entities constantly update each other. Of course it is through the activation of a certain layer – thus putting the camera image and the layer together – that memories are already created, or maybe *reactivated*. I here however want to discuss two special strategies to describe the interactive possibilities to create memories: the role as participator of the user, and, secondly, the role that time has in the creation of memories.

CREATING MEMORIES – USER PARTICIPATION AS A TOOL (COLLECTED BECOMING COLLECTIVE)

Not all layers have a relationship as discussed in the Berlin Wall layer, in which the physical and virtual have clear relations to each other. An example in which an additional (augmented) image is placed on top of the physical reality is the Eastern layer as demonstrated in Figure 12. Earlier in this thesis, the participative relationship between Layar and the user has been displayed, in which the physical position of the user – translated into GPS standards – formed the centre of action. Both through cognitive and physical intervention, discussed within the paradigm of embodiment, the user maintains an interactive interrelationship with the technology, in which one attitude now plays a significant role: that of *construction*. In this respect, two options flag up, the first being adding content *within* an already existing layer, the second being the adding content to the collective memory of Layar: the creation of a new layer.

Adding from within the memory – assimilation. Inspired by Jean Piaget (1896-1980), assimilation here basically refers to reconfiguration (see chapter one), yet be it not only the act of "moving the pixels" but the act of *adding* pixels. As however these pixels are not added to the entire application but the layer only – hence not changing anything significantly in particular – this is not seen as a constructive action. To demonstrate this process, I will take the already discussed seasonal greetings as example. Created by Marc René Gardeya from Hoppala, the "Hoppala goes Easter" layer was meant as a social tool to send Easter greetings to friends – and, insurmountable, other people being able to view the greetings enjoying them too. Figure 12 shows a representation of the layer, here displayed in the outer surroundings. What one experiences, is a screen full of eggs, each egg containing a greeting as for example in this layer Entfernu communicates: "Happy Easter! Looking forward to see you again!" Together, these eggs and greetings, created by individuals, form a collected memory of this layer, all elements sharing the fact that this single event brings their messages – in word and sight – in together. The collected memories are however only available within a certain radius, which blocks the possibility for the user to access all greetings. Then, the

FIGURE 11: EASTERN LAYER BY HOPPALA

discourse presented within this layer created by the makers consists not of a dogmatic dominance in Christian values, for, at least, it is not provided with Christian texts; rather it seems to be a popular utterance that celebrates Eastern, not for its religious background but for the sake of the event itself. How users interpret it – and if they do want to add a religious aspect to it – is then also free for them to decide. The layer, therefore, functions as the platform that intermediates interpretations, and provides the parameters for the user to express herself, in which her own thoughts (individual memory) are put next to utterances of others (collected memory).

FIGURE 12: EASTERN LAYER BY HOPPALA

Adding content however happens within pre-set conditions, in which the user can choose from a couple of egg-options and then add a personal message to it. She is free to place it at a specific location, providing the possibility for the other to find her egg. This is called the process of assimilation, the act of adapting to a pre-existing model. Users within Layar inhabit their behaviour within pre-existing codes and models, thereby making it possible for users to see their messages. The process of doing so is, I argue, an act of *creating memory*, for the cultural memory within that layer is adapted, yet within the social standard already given. The cultural utterances provided by the users each transform from individual memories into a collected set of memories that in the end forms an always updating discourse of collective memories – for the users are, together, forming a new 'map' for others to experience, thereby relying upon social and technological conventions. Hence, the presented frame 'decides' the output. But as has been described also, one must note the intersection of the memories, for none of them stand apart from each other. The layer functions as an intermediary platform only to exchange meanings.

Secondly, there is the act of *accommodation*; a way to participate on the level of construction: models and codes are being adapted through the input. I compare this to the creation of a new layer, in which it must be acknowledged that the technology forms a determining and 'framing' actor, yet, as has been demonstrated in chapter two, the act of technology never goes without cultural intervention. For instance, the creation of the layer "Splinter Cell: Conviction" enabled the user to play an interactive game, thereby shifting from just experiencing knowledge to experiencing game formats within present physical surroundings. Through this, collective cultural memory of Layar experiences a 'new' dimension: the addition of a game-format. The single layer (individual memory) becomes again part of the entire set of layers (collected memory), that together create a collective memory. Through the act of accommodation, new formats within the pre-set structure of Layar itself can be generated. Here, two strategies are exposed (assimilation and accommodation) that give the Layar user possibilities to add individual memories to the collective memory of Layar. This again is a characteristic of performance cartography, in which the user does not watch, but performs, thereby actively becoming part of the experience offered by Layar.

CREATING MEMORIES – THE COMPANY AS A TOOL (COLLECTIVE BECOMING COLLECTED)

It has been shown how the individual becomes collective, but the process goes both ways. Present and up-to-date knowledge about specific locations is not only a handy tool, it is also what some people might find very necessary: being able to access information at any time and any location. Although no layer really exists in the present – only the activation and actual experience is present – the "Schiphol Airflight" layer provided by Casper Frontier application gives an impression of the present through

what is assumed to be up to date knowledge facts by visualizing (live) aircraft movements. Although the website (not the layer!) mentions a delay of 15 minutes – which one can overcome through taking a subscription – the illusion within the Layar application is given that the dots one observes represent actual planes flying through the sky; most likely they are still in the sky when the user experiences it. So rather than seeing the actual plane, which is not always possible, the user is confronted with a layer of reality that enables one to 'look' through the clouds: that of air-traffic happening within the current moment.

This layer visually signifies the process of the creation of memories within Layar, adding them publicly to the collective field of collected memories already existing in Layar, for two reasons. First because the always changing entities (the planes) create new points of intersection, thereby continuously changing the digital stage the user experiences, and secondly because the application functions as a self-reflective commemoration of cultural and technical influences, in which the information given by the application functions as a reflection upon the discourse from which the commemoration derives its information from. This can be described through the following.

Let's begin with the second argument, for it explains the first for a large part too. Again, a focus has to be laid upon the relationship between the collected and the collective, and one has to acknowledge the fact that both cannot be seen apart from each other – for the collected (individual memories taken together) is influenced by general discourses (collective) and vice versa. Taking Casper into account, the application appears to be a set of choices made out of several discourses (economics, technology, social) from which I will take one example only. As the website states, the purpose of this application is:

1. To interactively inform about air traffic noise and movements;
2. To inform stakeholders and residents;
3. PR tool for airports;
4. Evaluation of air traffic movements.

   (*source: http://casper.frontier.nl*)

Now, let me focus upon point 1 and 2. Although it is suggested they share similar interests, the word 'interactively' reveals the difference: point 1 refers to *being able* to provide an interactive relationship with a user to inform about air traffic noise and movements – thus focusing upon systems – while point 2 refers to social (and economical) interests. Consequently, where Camillo's objective maintained the stimulation of individual memory through visual entities organised in space, it is here suggested that i) memories are not only awakened through a spatial organisation, but that ii) they intersect with other types of memory staged within the Layar. Going into more detail, it is here specifically argued that 'individual' memories – layers – (visually) expressed through Layar are influenced by a broader, collective memory, but also together form both a collected memory (taken all the individual layers together) which becomes part of a collective memory existing around Layar (see the previous paragraph). The first argument, then, refers to the process of updating – thus it being a memory, carried out by machines, which is constantly subdue to the principles of *assimilation* and *accommodation*. As such, the collective discourse from which the collected memory (Casper) derives its information from, is constantly subdue to the act of transformation. It takes out those elements of the collective memory that are useful for its own individual contribution, thereby forming a collected memory. But just like Eastern Egg layer, Casper specifically presents a memory that is determined by its temporal dimension, for it updates air movements at any time thereby showing the dynamic character of memory presented in Layar. This trait specifically enables users to engage with Casper, for it does

not show air traffic of a week ago, but rather gives information that concerns the 'now' of the user: time then here becomes a significant aspect in the creation of a meaningful relationship.

THE FUTURE IS NEAR

As has been demonstrated, Layar both updates the past and the present *within* the present moment through which also actantiality is created: the opportunity to 'now' interact with the spatially organised layers evoke a behaviour that also centralises the actual moment as the user can, for instance, immediately react upon it. But the set of layers existing in Layar also concern referents to the future, for example when the user calculates a route towards a location: GoogleMaps calculates how many kilometres and how long it will take her to get there. But another interesting example form art and architectural layers. Take the "Market Hall" layer in Rotterdam, a project by Provast, where users can get an idea of how this new building – supposed to be ready in 2014 – will look like and how it functions. Rather than wondering what the machines standing at the place will bring, they can now easily activate this layer and get a glimpse into the future. Here, (illusionary?) memories for what is yet to be come are generated. Such layers emphasise the location – hence the spatial dimension within Layar where spatial movements lead the user to different temporal experiences. This too is a significant difference from the stage Camillo proposed, for Camillo specifically dealt with one philosophical subject only in a given time set and location. Layar however almost offers a sort of time machine, based on spatial organisation of visualised memories where the user herself becomes the leader of how to determine her path and activate these memories.

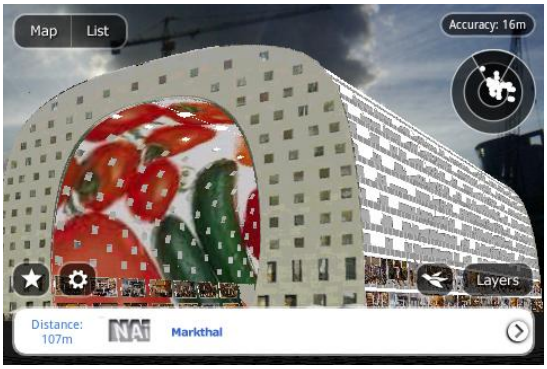


FIGURE 13: MARKET WALL LAYER - ROTTERDAM

NETWORKED MEMORIES

An important characteristic Wood ascribes to performance cartography is the act of memory. Like Camillo, Layar attempts to reactive memories from users by showing images by the act of a spatial organisation. Although Camillo only focused upon the awakening of individual memory, his 'theory of association', as I will call it, is also successfully employed by Layar. Through the intersection of several memories, users are able to make associations and therefore, to find several Points of Contacts to engage with the program. Throughout this chapter, it has consequently become obvious that Wood was right: memory indeed takes in a central position when it comes to performance cartography, but moreover, the *intersection* of several sorts of memories creates the path for users to appropriate the experience. In other words: because the memories interact with each other, actantiality is created.

Taking the previous into account it has become clear that one cannot just speak of 'one' memory, for none of them occur apart from each other. The memories of the user intersect with the collective memories deriving from other sources in which we again recognise a rhizomatic structure: together they continuously transform perception. Although Camillo did not speak of such an intersection, he did seem to implicitly recognise the transformative strength of his mnemonic method, for his desire entailed a transformation in the mind of his audience, giving access to 'true knowledge'. I here want to take a brief pause moment, for the moment of duration now again comes into play – which entails, to remind the reader, the inner experience in terms of time. Again, note that this specifically *does not* entail a more conscious experience of time, but rather that time as we now know

it, becomes redundant: it is the moment of flow that matters. For instance, in Camillo's case one can think of the moment of transformation: it does not matter how long the viewer stands in front of the stage, but moreover what she experiences and how intense the experience is while standing there. And this 'whatness' is not determined by quantitative factors as seconds, but by qualitative factors such as the level of enjoyment, or transformation for that matter. Before I however discuss the relation between duration and transformation, let me first explain the latter through having a look at the readings of Bergson once more.

THE PRESENT SEEN AS THE FUTURE COLLIDING WITH THE PAST

The matters discussed in these examples specifically contain a collective memory, in which cultural heritage is remembered through digitised visual and augmented representations through space. The site-specific program actualises both collective and individual memories within the moment of interaction and therefore creates an experience in, I would say, the realm of *duration* – which has already been discussed in chapter two. The intersection of several memories and how they create actantiality, then, begs for answering a question that involves time: the past and future seems to become part of the present, thereby contextualising the present. To clarify this process, I again turn back to Bergson, whose interesting thoughts on memory appear to provide a very appealing respond to this subject.

In *Matter and Memory* (1911 [1896]) Bergson discusses the "reality of spirit and the reality of matter, and tries to determine the relation of the one to the other by the study of a definite example, that of memory" (82). However, an interesting aspect he poses is that of the intersection of the past, present and future, coming together in the act of the present:

> [..] what I call 'my present' has one foot in my past and another in my future. In my past, first, because 'the moment in which I am speaking is already far from me'; in my future, next, because this moment is impending over the future: it is to the future that I am tending, and could I fix this indivisible present, this infinitesimal element of the curve of time, it is the direction of the future that it would indicate. The psychical state, then, that I call 'my present,' must be both a perception of the immediate past and a determination of the immediate future (Ibid., 177).

Although his main purpose is to study the relationship between the physical and perception, I will only focus upon this aspect for it provides an interesting and helpful insight into the working principles of (the staging of) memories. By definition, memory entails the act of restaging subjective thoughts and habits that refer to something happened in the past. But at the same time a reference to the future is made, for instance through the image of where one is heading towards. Let's have a look again at the Berlin Wall layer. Here, the past is reactivated through an image of a grey wall that is seemingly placed at the spot where the real Berlin Wall had stand. In different ways, the reference to the past evokes different emotions, yet it is clear that for all members, the past is reactivated in one's mind at a present time. The reference to the future can, again, manifest itself through different ways, but a clear example would be the reference to the future made by the older lady who states that such an event should not happen again ever, thereby imagining future threads. But again, through the transformative capacity created by the interlinked structure of memory, the interpretation of the past, present and future can exist in many different formats.

The present as experienced through Layar, then, becomes a special entity, for it is full of references of the past, but also the future. Moreover, in all layers the 'presence' of the current time is emphasised through the focus upon the here and now, for the performing layers are all staged against a podium of the now – the image one sees behind the screen of the telephone. In another way, the present is emphasised in some layers by its possibility to update layers and add comments to them – again giving the user the possibility that she is actively present, at this very moment, in the creation of the experience. The moment of duration then, here understood in terms of agency that is brought forth out of the intersection between individual and collective memories of the past, present and future, is then again to be understood within a network culture. As has become clear within this chapter, memories are never to be seen as entities on itself. Moreover, they are characterised by their complex interactions with the self and the other, through different levels, thereby both belonging to homogeneous and heterogeneous structures. It is not just the content only that intersects with each other, nor the time (past-present-future), but also the levels on which the content is spread (collective-collected-individual) which is accessed by the spatial movements of the body. Therefore, the transformation that is evoked by the intersection of these different aspects is of influence of the quality within the notion of duration.

THE PERFORMATIVE CARTOGRAPHER – PART 4

I am now close in bringing all elements together, where the web of associative transformations is being explained through a couple of nodes: Layar as an act of mapping, performance, embodiment and memories. This chapter dealt with staged memories from different levels (homogeneity) and times (heterogeneity) and made an attempt to show how the user can appropriate the experience performed by Layar through the act of remembering. The act of remembering, as it has been shown, is not an easy act to understand, yet it is crucial to the act of mapping: it makes the experience real. The latter statement makes clear why I used Camillo's theatre of memory as a frame for this chapter: apart from the similarities – visual presentations organised throughout space – this framework gives the opportunity to show *how* memories perform and work together to create meaningful relationships. Through the performative characteristics of both Layar and the user, memories are actively interwoven with each other, thereby adding another layer to contextualise a given situation. This intersection, it is here argued, gives the user significant elements – entry points – to appropriate the experience as has been illustrated by the layer concerning the Berlin Wall.

When related to performance cartography, this chapter has shown that Wood's definition of memory appeared insufficient; when taking notions of memory into account – crucial to the act of mapping – one cannot speak of only one kind of memory for none ever stands alone. Additionally, performance cartography is specifically a type of mapping in which the notion of duration and transformation play a crucial role: through the act of performance (in this particular case this being the memory) in the current moment and time, connections are made that can easily change. It is for this reason why the concept of performance cartography comes out useful to study a mobile expression such as the mapping application Layar.

CHAPTER FIVE:
THE PERFORMATIVE CARTOGRAPHER

(OR: CONCLUSION)

EVERYONE'S A MAPPER

WOOD 2001, 111

EVERYONE is to be regarded as a mapper, Wood exclaims. In this statement, he refers to the fact that studies have shown that every single person has, on one level or another, the capability to perform spatial actions on information "residing in a cognitive atlas, which is consulted constantly" (Wood 2001, 111-2). As has been argued throughout this thesis, I agree with him on this viewpoint, yet have to make a conclusive remark that the ability to map is not just enclosed in the cognitive sphere only. The aim of this thesis was to show that Wood proposed a very fruitful term, but did not manage to go beyond the dialectic position of the material versus the cognitive which at the same time gave him the freedom to not concentrate upon matters such as performance, memory and the role of the body. It has however been demonstrated that performance does not only include the cognitive, but rather suggests an interrelationship between that which is staged (the experience) and those who experience it (experiencers), thereby including the material, the physical and the cognitive.

As came out in the four chapters, several categories in layers were to be recognised that are typified already by Lens-Fitzgerald himself (2010): i) the *"where-is"* layers that refer to specific locations such as hotels and restaurants; ii) the *"live and dynamic"* layers, where users could both experience seemingly live and up-to-date information, such as tweets or aircraft movements, and add content to it; iii) *"inside layers"* where users could play with the past, present and future – think again of the Berlin Wall or the future Market Hall in Rotterdam; and iv) "*stories and games"* layers in which an interactive attitude from the user was required to complete the game. Each chapter, then, focused upon another element within the layers and its application, which are brought together in this chapter to create a starting point for the redefinition of performance cartography that might lead to other interesting insights. I have made an effort to describe the complex net of transformations central to the concept of performance cartography through taking a couple of leading marks into account. Firstly, chapter one focused upon the map itself and its navigational use, for the act of navigation is, historically seen, one of the core objectives of the map. After having described how this activity is to be seen within Layar, I examined how the act of mapping could be made possible, thereby focusing upon performative qualities of both the technology and the user as they declare their presence to each other. But the mobile application was not only to be understood within terms of performance, it moreover appeared that the body of the user took in a central position of the experience. Chapter three looked at this process in more detail, and revealed that the embodied act of mapping (the interaction between the cognitive and the mind on the one hand, and the application on the other) is central to interaction possibilities with Layar. Lastly, chapter four centralised the ability to map through taking operations of memory into account – an element that was essential to Wood's argument of performance cartography.

RHIZOMATIC TRANSFORMATIONS

Throughout the thesis, two elements stood out: the rhizomatic structure that is characteristic for the way the user can engage with Layar and the notion of transformation within the moment that enabled me to study the mobile traits characteristic to Layar. Both elements appeared to, from a theoretical viewpoint though, have a significant influence on the way the user can appropriate the experience, to which an explanation for this argument is laid in the creation of agency. In chapter one it has been shown that Layar specifically concerns a mobile mapping application that requires the user to participate in the process of creating the experience. Chapter two provided a framework that demonstrated how this process takes place – namely through performative conventions – and argued that the way a map-related performance takes place is always bound to a specific time and location

which creates, therefore, a unique situation that cannot be repeated in the exact same way. Just like the rhizome that has neither end nor beginning – hence no origin – the performative act of mapping is constantly subdue to the act of transformation in which the outcome will always slightly differ. It is exactly here where space is saved to create actantiality in order to provide actors with agency: the parameters that provide the user with a certain set of factors to react upon that are again and again re-activated and refined.

Both chapter two and three explained that the changing set of parameters is not an activity characteristic to technology only, or, for that matter, the user – but that they are together interwoven with each others worknet through performative values. This interaction then becomes an important trait of performance cartography where both entities stage themselves in front of another, thereby making it possible to evoke interrelated reactions that enable the user to create a map-experience through Layar. Specifically in a mobile mapping application like Layar it appeared that the body of the user – translated into GPS coordinates – takes in a central position, for it forms the leading reference to the technology to start the experience from. Additionally it is through the body that the user 'navigates' through the mobile map and creates perception – firstly because she has to user her hands to navigate through the screen, and secondly because the movements of her entire body through the web of GPS coordinates reveal new experiences.

It is here where chapter four comes into sight, where the experiences created by Layar are seen from the perspective of memory. Agency – and hence, I argue, appropriation possibilities – is here created out of the intersection of several memories, where the user both experiences total new but also familiar information, to which she can contribute by adding personal memories. Again I encounter the emphasis of the user's body in this type of mapping, for the map-related memories are accessed through spatial movements of the user. The map that is created by the user's directions – that is, as has been argued in chapter one, characterised by its rhizomatic nature where elements are seemingly randomly connected to each other – is then responsible for the specific experience the user will have. It is for this reason why a comparison was made to the theatre of memory as proposed by Camillo – for here too experiences were triggered by the intersection of memories in which spatial movement led to an activation of this process. I am now back at the three stages of Fiorelli et al. (2009), who discussed mobility in terms of the cognitive, the physical and the virtual: as has been demonstrated throughout this thesis, it are specific those elements that are intertwined with each other through a rhizomatic structure for none of them only function on just one level. To put in different words: they are not 'picky' in their choice where to relate to. Moreover is this often a choice that is already made for them, as for instance the user connects the virtual memories of the Berlin Wall to her physical location and body as well as her cognitive mind. The mobile and digital map offered by Layar hence creates agency through the combination of these levels of mobility.

Although Latour (2004) specifically mentions that not all the elements responsible for the creation of agency needs to be summed up (for this is also an impossible task), and rather states that actantiality – that which constitutes agency – needs to be described, I have still named some key elements that I believe are crucial to understand the *act* of performance cartography in Layar. What is however crucial to understand is that these elements operate within the current climate of *mobile* technologies, which also make it possible to evoke such behaviours as rhizomatic structures and the flexibility of transformations. Consequently is it desirable for future cartographic research to examine this process of mobility in more detail.

DURATION – THE MOMENT OF THE NOW

Much emphasis has been laid upon the moment of duration – that is, the moment of the now that does not has a quantitative base but is experienced in terms of qualitative states. Again the performative is here encountered, for it is through the performative that the differences in quality of the Layar experience arise. Bergson has argued that duration entails the intersection of the past, the present and the future, which can be demonstrated through the following. Interviewee B has stated that she was satisfied with the information Layar provided her with when she was looking for cash machines. This quest, to take an example, includes all timeframes for the past is represented in her action of searching for a cash machine: by experience she knows this is a device that gives her mobility as it for instance enables her to buy a dress on the market. The direct future is presented in where she is heading towards: she wants to find the cash machine to withdraw cash. Then what she calls her present is a continuous update of both the past and future that are activated in the current moment. How she then experiences that the current moment becomes a qualitative state of duration – here referred to as a degree in satisfaction.

As I here specifically approached Layar from a user perspective, I have framed the notion of duration in terms of the experience the user derives from the interaction with Layar – which is also why I argue that the moment of the now is of such significance. Moreover is the moment of the now in Layar made accessible through spatial movements where the location at a given moment creates the moment of duration. Performance cartography that is carried out by Layar then is to be regarded as an activity in which the map becomes the experience: the user maps her route through emotions and experiences – captured in memories – of both herself and others. Here the user has to be regarded as a bricoleur, where she walks through the memories that are presented to her and (consciously or unconsciously) decides to which memories she wants to relate to, thereby leaving a rhizomatic trace. Chapter one has explained navigation in terms of territorialisation and deterritorialisation; it is that which I argue is at the heart of duration, for the user's moment of duration entails the attractiveness in wanting to become part of the map and vice versa; both Layar and the user state their presence to each other and want the other to become a part of its existence. Again appears the performative to be crucial here, for both entities stage oneself to one another in terms of technological and social 'success', where success implies the believability of the other that acknowledges the presence. The relationship between Layar and its user is then constantly subdue to the act of transformation and reliability, that greatly determine the willingness and capability of the user to appropriate the experience which is here described through a qualitative state of duration.

PERFORMANCE CARTOGRAPHY

Maybe without even realising it, Wood proposed a very fruitful term to study future mobile mapping applications in which a further framework is offered in this thesis. The notion of performance cartography becomes very useful, for it specifically stresses the performative nature of the entities that are involved in the process of map making – a trait that is especially relevant in current mobile applications where the performance is constantly subdue to change. I here immediately find my second argument for the usage of this framework for it also stresses procedures of transformation. Hence, rather than just revealing the process of how meaning is created out of objects only – to which many research is devoted – such an approach offers insights in the process of appropriation through analysing interaction possibilities of the entire body while the experience lasts. It should however be stressed that the entire experience and how meanings are created out this experience are strongly

interwoven with each other as it is through the embodied act of creating an experience that meanings can arise. Particularly in this respect, ANT appears a useful method of how to study such fluctuating phenomena. Binding these two aspects together then – the performative and the transformative – I suggested that one can now also examine aspects of how connections are made that create the specific experience, or in other words, to focus upon the rhizomatic structure that is characteristic to performance cartography in mobile mapping applications. The framework I suggested, it follows, also studies duration, for it specifically concerns the connections made in the moment of the here and now – which is not characterised by quantitative matters, but by qualitative matters such as social confirmation, enjoyment and flow. To study mobile map-related activity from the perspective of performance cartography then, as is here posed:

i) Centralises the *embodied* user as an active entity within the process of map making;
ii) Acknowledges and analyses the performative character of both the user and the mapping device;
iii) Acknowledges and analyses the transformative nature of the relationship between the user and the device;
iv) Focuses upon appropriation possibilities, especially with regard to the mobile character of the mapping application;
v) Needs to focus upon operations with regard to memory – and how the staged memories intersect with the performative nature of the memory of the user.

When taking again the future vision of Microsoft into account that sketched a future vision of a certain society in which technology is transparent but windowed at the same time, transferrable, and embodied – both by ordinary objects and humans – Layar can certainly be seen as an application which (implicitly) carries out the desire of being 'anyplace, anytime, anywhere and by anything'. Given its huge success, it is yet to wait for further applications that carry on with this idea. Nevertheless, it needs to be emphasised that we are here witnessing a baby-phase of this technology, for it has often shown that the technological malfunctions sometimes lead to dissatisfaction. GPS, for instance, does not work well indoors, or might not be accurate enough – the information given is then not of relevance to the user at all. But the most important feature that Layar carries out it stresses the *nearby* surroundings of the user, in which the 'global village' actually becomes local again – but made possible by the global.

FOR FUTURE DISCUSSION

Due to time limitations, a couple of choices have however restricted the outcomes of my research. As the reader may have noted, I have questioned three actual users of Layar to gain more insight into how users might perceive the application. In these conversations, they gave me a more thorough understanding of how I could value Layar. In future research where it also concerns user experiences, I would definitively recommend a complementary qualitative study with more users, for i) two heads are better than one, and ii) interviewees give the opportunity to reconsider the framework one has already used – through questioning actual users one can get insight into processes one would otherwise maybe not consider. The focus would then be laid more upon (possible) user interpretations – valuable to the creators of Layar and layers. A personal captivating angle would also be to study it from the perspective of performative play, and consequently deal with how the user 'plays' with what is offered to her.

With regard to the notion of embodiment, I have only discussed the matter of memory in the realm of the cognitive mostly. I have stressed the intersection of the virtual, physical and cognitive in this matter – for the three always work together, especially when (re)activating and creating memories – but I have not put the matter of memories carried out by the entire body at the centre, or body parts, for several studies have shown that memories are not just located in the human mind only (Bergson 1911 [1896]; Casey 1984; Kott 1992). To better understand the notion of embodiment, it would therefore definitively be worth examining this relationship more thoroughly to learn more about appropriation principles that concern the whole body. Moreover do I recognise the need to further examine the way the physical body forms an entity in the creation of perception and hence how the body operates as a 'tool' to appropriate experiences. Throughout this thesis, I have argued that the body too shapes perception, but when taking on a retrospective perspective, this would definitively be a very interesting subject to further elaborate upon.

Additionally would it be interesting to focus upon more parameters than I have done in this thesis (mapping/navigation – performance – embodiment – memories), such as the way design can evoke certain behaviour, or how design can create emotion, thus focusing more upon the *emotional* experience users have when interacting with a map. Another interesting aspect would be to study the social use of mapping applications, for Layar already demonstrates a somewhat basic implementation of social usages – for instance through Tweets layers – but during my conversation with Groenhart, he also implied that Layar wants to embed more social features into its mobile map. For me it was a clear choice not to focus upon economical and political structures, for I mainly dealt with the creation of the user experience in terms of (cultural) performance, but it would certainly be very fascinating to examine how user experiences are both opened and restricted by choices made by others – thus focus upon the field in which Layar operates.

Interviewee C has declared that Layar did not reach his expectations; sometimes due to technological malfunctions and false references – hence a matter of technological performance – but also because he could not find something of interest to him (interview 2010). Interviewee A too states that she would love to experience more layers and that her dream layer would be to look through buildings to see what located in it. Maybe the latter – the matter of interest – is partly due to the Dutch climate; often this has been typified by its sober and steady character as opposed to for instance Korea where they are very eager to try out new products. Note however that this is just a loose guess for which no evidence is given in this thesis. But to focus upon the matter of technological malfunctioning again, it is indeed true that I did not highlight the matters of malfunctioning or a somewhat poor representation of elements; sometimes the graphics remind me of early computer games with its angular and not very 'realistic' (where I refer to the willingness to believe the image, not to state whether or not it looks like reality) images. I have two reasons for this choice: firstly because I mainly wanted to focus upon how the application can evoke engagement from the user and secondly because applications such as these are still in a developmental phase: the overall network of capabilities of technology, economics, society and politics limit the possibilities to deliver a perfect technological performance. Hence I definitively see great possibilities for this technology – of which some of them I already observe! – but only time can tell how this mobile mapping application will further develop itself.

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APPENDIX: INTERVIEW QUESTIONS

DATES

Interviewee A: email conversation March 27 2010

Interviewee B: email conversation April 1 2010

Interviewee C: personal conversation April 5 2010

QUESTIONS (GENERAL)

- Which platform does your phone operate on?
- How often do you use Layar and why?
- Do you consider Layar as a useful application? Why?
- Do you consider Layar as an application for entertainment objectives? Why?
- Do you enjoy the fact that you are 'part' of the map, rather than looking at it?
- Do you consider the information that is offered to you to be relevant?
- How do you value the time necessary in order for the program to load itself?
- How do you value the type of layers you can now choose from?
- Do you think that you as an user have enough opportunities to meaningful engage with Layar?
- Are you satisfied with the performance capabilities of Layar?
- Do you think Layar is a user-friendly application?
- Which layer would you definitively add to Layar?