Mobile Media:

New Mediations in the Urban Space

By

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Abstract

The development of Information and Communication Technologies during the second half of the twentieth century established an accelerated process digitizing cultural objects, transcoding analog information into digital data. As the speed of digital networks increases exponentially and the Internet spreads out beyond its imagined scope, we enter the information age and the process of globalization is consolidated. Digital media has become the central nervous system of contemporary society, and the recent popularization of mobile media has intensified the dynamic process of mediation and communication in post-modern society to the point of a paradigm change: from the monopoly of mass media culture, to decentralized transmissions in a post-mass media era.

These technologies shift the place of mediation, affecting the way society explores, perceives, and interacts with the physical space. As a result, mobile media become an important interface in the production of social space: a new type of hybrid space, composed of digital layers that overlap the physical environment, is produced. Some commentators claim that this raises serious privacy issues, pointing toward a world of absolute surveillance and social control. Conversely, tracking, control and surveillance are actions taken in the digital layer in order to interact with physical places, which can empower people, enhancing direct participation in society, as well as encouraging (re)appropriation of private and public spaces.

This thesis builds on sociological approaches and media studies theories to understand how intensive use of wireless communication systems in conjunction with digital networks enables massive participation in the production and distribution of information, resulting in a decentralization of social mediation processes. In other words, it exposes how mobile technology, its social relations, and the relationship with the material and symbolic world in contemporary society, is reforming mass media and redefining our perception and experience in everyday urban life, and reinforcing the importance of space and place in the development of sociability and the construction of people's identity.

Dedication

To Ruth and Kleber.

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Introduction

As part of the process of globalization, the development of Information and Communication Technologies (ICTs) during the second half of the twentieth century, especially the personal computer and the Internet, established an accelerated process digitizing cultural objects, transcoding analog information into digital data. The speed of digital networks increased exponentially and the Internet spread out beyond its imagined scope, influencing the consolidation of a global society: in the information age, digital media has become the central nervous system of contemporary society. Thus, with the proliferation of digital devices, new forms of social relations have been emerging, affecting economical and political issues, as well as personal relationships. In order to not be overwhelmed by such new technologies, researchers have most often attempted to identify and isolate different components of digital media to understand how they operate, focusing on a myriad of aspects, such as the democratization of information, decentralization of communication, privacy and surveillance, social mediation, new economic paradigms, video games, cyberculture, and so on.

The recent popularization of mobile phones and social network platforms in the 2000s intensified the dynamic process of mediation and communication in post-modern society to the point of a paradigm change: from the monopoly of mass media culture, to decentralized transmissions in a post-mass media era. As Lemos (2010) states, post-mass media is composed of open communication networks that expand beyond traditional channels and operate according to the three basic principles of cyberculture: (1) decentralization of emissions, (2) bidirectional connection, and (3) reconfiguration of institutions and cultural industry. Therefore, mobile media — the convergence of mobile devices, digital networks, and pervasive computing — shifts the place of mediation, enabling information production and consumption in transit through physical space.

As we experience the world not only through our sensorial apparatus (sight, hearing, taste, smell, and touch), but also by means of social-cultural products (language, art, power, knowledge, and technology), mobile media have become an important interface to or in public space due to their technical capability to wirelessly connect to other devices, track geographic position, capture audio-visual information, and broadcast data. In this context, mobile media affect the way society perceives, conceives of, and interacts with physical space, allowing both the user and the environment to communicate with each other. For instance, web mapping services, such as *Google Maps*, provide rich information about the user's location, enabling them to navigate and explore the space around them; built-in cameras in conjunction with store-to-share services like *Flickr* and *Instagram* let users imprint their own identities onto places; geo-locative platforms, like *Yelp* and *Foursquare*, help people browse for places of interest, such as restaurants, bars, and stores; and social networks, such as *Facebook*, *Twitter*, and *Google+*, allow people to interact with each other and tell stories about their life.

As a result, mobile media add new layers of information to space, extending our senses and awareness in both the digital world and the physical environment. A new type of space is produced: a hybrid space, composed of digital layers that overlap our physical environment, introducing new forms of interaction with cyberspaces, as well as encouraging reappropriation of private and public spaces. As noted by Lemos (2010), mobile media is not seeking to overcome the real, or to put an end in physical places, but to "put the emphasis on control, territorialization [and] production of content bound to objects and places" (p. 409). Hence, tracking, control, and surveillance are actions taken in the digital layer by actors, both ordinary people and professionals, in order to interact with physical places.

Consequently, mobile media practices imply a persistent tension of mediation between different agents regarding to not only information consumption and production, but also production of public and private space. By focusing on the current methods that people have employed to interact with space, I attempt to expose how these increasingly open, collaborative, and customizable media are changing the balance in social power relations. The goal is to show how

urban computing and locative media practices allow a wider participation in the production of space.

My thesis focuses on the emergent use of mobile devices as an interface with public space in an attempt to better understand how, contrary to the argument that these devices withdraw users from space, mobile media can be used to change the balance of the production of space. While it is important to note that the use of technology to interface space is not new (*e.g.*, books and personal music devices), we should also acknowledge the changes that emerge with newer types of mobile technologies, particularly smartphones.

Today, the smartphone is an important technology for interfacing and mediating our experience of space due to its rapid expansion and high penetration in society. As a phenomenon, the mass adoption of smartphones began in 2007 with Apple's iPhone and others devices using Google's Android operating system. These devices added a number of functionalities to old mobile phones, including a Global Positioning System (GPS), digital compass, accelerometer, light sensor, camera, Wi-Fi connection, audio and video capturing tools, and a tangible user interface. Because smartphones embed so many tools, they can be used for any purpose and by a wider target audience. Moreover, new economic and cultural ecosystems were created around these mobile devices, allowing developers to use dedicated Software Development Kits (SDKs) to produce applications that can take advantage of a smartphone's built-in features. These types of functionalities, once only available in desktop computers, expanded the engagement potential of mobile devices allowing users to interact with not only other people, but also with the physical and virtual space: the smartphone added mobility to the digital world.

Working under the assumption that the intensive use of wireless communication systems in conjunction with digital networks enables massive participation in the production and distribution of information, resulting in a decentralization of social mediation processes, I look for indicators of how relations between mobile technologies, urban space, and everyday life are being actively reconfigured in the process: if mobile media are transforming mass media culture,

they are certainly reforming and redefining our perception and experience of urban space in everyday life. That is, mobile media are an emergent instrument with the potential to increase the capillarity of social involvement, enhancing direct participation in society, and, more specifically, reappropriating urban space for different meanings. Ergo, the usage of mobile technologies, their social relations, and their relationship with the material and symbolic world in the contemporary society, produces a new format of space: a hybrid space framed with elements from both digital and real space, or as Lemos (2010) calls it, an informational territory — a digital information flow that intersects urban space and cyberspace. Mobile media reinforce the importance of space and place in the development of sociability and the construction of people's identity.

I draw on the social space theory and the sociological definition of space and place to understand and account for the complexity of human relations to and within space. As Lefebvre (1992) asserts, each society produces its own space based on its own rules, culture, and system of production. Space then, is not a prior, neutral, or a passive canvas for social relations, but an active force that reflects values, ideologies, and power structures. So, the space produced through mobile media is nothing more than the result of these forces, which affect and are affected by different social actors. As in the case of our capitalist society where we produce spaces of consumption, the digital hybrid space represents an extension of the same logic with some additional elements, for example the ability to attach information to places and receive place-specific information. My thesis seeks to build on this approach to understand everyday life in the 'networked city,' especially in terms of how emergent technologies stand to reshape our experiences of spatiality, temporality, and embodiment.

In addition to the sociological discussion, building on the media studies approach, as well as on observations of common mobile media practices, my thesis strives to show how the evolution of ICTs is leading to a crisis of mediation authority: the implosion of the mass media culture established during the twentieth century. Through the contradictory logic of capitalism we not only created an extraordinarily centralized apparatus of information production and distribution (including practices of manipulating the truth and distorting reality), but also developed a unique

decentralized system based on multiple sources connected through digital networks. This is a remediation process, as Bolter and Grusin (2000) call it, where new digital media is absorbing, if not replacing entirely, mass media culture. This new paradigm shifts mediation from a 'one-to-many' direction to 'many-to-many,' so that, instead of a static and hierarchical organized flow of information, communication becomes multidimensional: made of dynamic and decentralized network connections between many sources.

Ultimately, I aim to present the argument that mobile media can be a point of inflexion between a long-established and well-defined urban attitude of ignoring the space around us, and a new form of expression that actively explores, transforms, and customizes hybrid spaces. I draw out the idea that hybrid urban spaces and social behaviours are increasingly expected to be more expressive and more participatory, but not without a cost. The intense use of mobile technologies generates tensions and contradictions between social agents: people use mobile media as a way to coordinate decentralized actions in order to resignify places and territories; at the same time they are surveilled by corporate interests, feeding the hegemonic power with their personal information (preferences, location, mood). Ergo, mobile media are highly surveilled and controlled by those who own the infrastructure of information and communication, ultimately dominating our sensorial engagement with the world and maintaining social and property relations.

1. Spatial Turn

For Mitchell (2011), the twentieth century witnessed the convergence between geography, history, and the humanities. The **spatial turn**, as some scholars have been calling it, is a "response to, and ongoing dialogue with, the eighteenth-century emergence of geography, geology and history as separate disciplines" (Mitchell, 2011, p. 72). So, the concept of *space* and *place* that I mention here goes far beyond the definitions used in cartography or geometry. Instead of just

locating a point or shape on a map, space and place emphasizes and, in some way, connects geographic locations to culture and human psychological aspects. As Deleuze proposes: "the world is made up of superimposed surfaces, archives or strata" (as cited in Mitchell, 2011, p. 71), and the digital is now one of its dimensions.

This interdisciplinary initiative requires rethinking not only theoretical arguments, but also research practices. On the theoretical side, such a study must reveal social relations and 'spatio-temporal multiplicity.' In order words, for Prieto (2011), it has to emphasize the social representation of the space and the fact that institutionalized power shapes the information and restricts our access to counter-hegemonic forms of knowledge. Therefore, rather than being seen as a neutral environment, **space has to be understood as socially produced** (Lefebvre, 1992). On the other hand, research practices have already been transformed by recent developments in geospatial technology. Since the 1990s, Geographic Information Systems (GIS) have been used to capture, manage, analyze, and display all sorts of geographically referenced information. Whereas GIS has been criticized for its strong quantitative approach, some scholars have found that "mapping phenomena and cultural objects provides additional insights not previously known" (Harris, Bergeron, & Rouse, 2011, p. 227). In the last 10 years, many other tools were also made available, offering geospatial exploration to the general public: if we ever thought that we had explored the whole planet, *Google Maps* proves that there are many other ways to see and experience space.

To study social space, Harris *et al.* (2011) suggest the adoption of the sense of 'being there' and the affordances of immersive technologies: visual-cognition, built on top of highly interactive and dynamic graphics, "create[s] mental models that transform the user from passive observer into an active participant controlling the way in which complex information is displayed" (p. 232). Video games, having powerful graphical engines capable of generating impressive photorealistic environments at high speed, are one way to accomplish this. Although they are focused on entertainment, new research is experimenting with game design and interactive technologies to produce serious games and immersive learning simulations.

Nonetheless, video games are not the only digital tools to study and create spatial storytelling. Harris *et al.* (2011) focus only on immersive three-dimensional features, missing other technologies that could be very useful to explore, analyze, and comprehend spatiality and human behaviour. For instance, (1) **augmented reality interfaces** blend the virtual and the real world, delivering similar experience as games; (2) **mobile media**, which is the object of this thesis, enables engagement between the user and space through technology (*e.g.*, smartphones) and digital networks, producing new opportunities for territorialization and storytelling; and (3) **social network platforms**, a rich resource for geolocated information.

Nonetheless, a critical analysis has to accompany the study of these new technologies. Media technology evolved not only based on technical problem solving, but also on ideology and political momentum — "in no way is this a history of communications systems creating a new society or new social condition" (Williams, 1974/2003, p. 295), but there is clearly intentional direction in its development. Consequently, there are "difficulties to separate the layers of meaning that are embedded in any landscape, space, or place, and recombine them in ways that are meaningful within the context of experiencing landscapes in digital environment" (Harris et al., 2011, p. 233). Whereas the technology is able to interface with any environment, the representation of the space is, as Lefebvre (1992) asserts, always historical, political, and socially produced; therefore subject to intended and unintended distortions.

2. Chapter Summaries

2.1 Chapter 1: Spatial Turn

As mobile media presuppose mediation in movement across the space, blending digital data with physical environment, the very notion of space has to be taken into consideration. Nonetheless, *space* (and its companion *place*) are loose terms that comprise definitions ranging from concrete

physical locations, to the abstract notions belonging to a certain region. To build the grounds for a discussion about mobile media, this chapter uses a sociological perspective to examine the concepts of *space* and *place*, address social components of space, and demonstrate that space is the practiced place.

Rather than a concept that describes a mere physical location, space has to be understood in its multidimensionality: a juxtaposition of social spaces in real places, which sometimes do not match with each other, producing *heterotopias* (Foucault, 1984) such as the cyberspace established by digital media. My intention is to expose how Lefebvre (1992) conceptualizes space in the way that it is shaped as a reflection of a given society. However, scholars do not always use the same definitions of space and usually disagree about spatial relationship concepts, particularly *space*, *place*, *community*, *mobility* and *mapping*. Lippard (1998) and De Certeau (2002), for example, contradict each other by using place to describe space and vice versa, recasting the meaning to fit in their particular notion of space. Clarifying the nuances and distinctions between these terms is central for understanding how people conceive, perceive, and live the space, and is key in grasping how mobile media are shaping our experience of hybrid spaces.

Since the infrastructure that supports mobile media functions and the majority of producers and consumers are in the urban space, this chapter also defines what constitutes a city. Using Mumford's (1937) typology of urban spaces and following Sassen's (2006) concept of global cities, I strive to show that high-density places increase the speed of society, producing alternative modes of living and innovative ways of perceiving space. Mobile media will build on urban infrastructure to introduce a new way not only to interact with an urban space, but also to reappropriate and virtually augment the city.

2.2 Chapter 2: The Crisis of Mass Media

Prior to discussing the current state of mobile media, we must first understand what comprises Information and Communication Technologies (ICTs), how they evolved, and their impact in our society. I have divided this chapter into four sections in order to describe how mass media

developed during the twentieth century from mechanical to electronic form, extending human capability to communicate and deliver information. Through a genealogical analysis, I hope to show how mass media succeeded at becoming a powerful social regulator during the twentieth century, but started to collapse in the face of new digital media.

The first section focuses on mechanical reproduction machines, and their capacity to store and reproduce audio, image, and movement. The invention of the gramophone and the development of cinema, for example, established the standardization of information (Kittler, 1999), which enabled production of art in great scale and had a large impact on the democratization of art consumption (Benjamin, 1936/2008b).

The constant evolution of broadcast techniques is the topic of the second section. With the ability to reach massive (global) audiences, radio and television began the mass media culture that we know today. Since these technologies enable transmission of information in real time, mass media affected the whole planet with the project of transparent mediation, delivering to spectators the illusion that what they see is authentic. Nevertheless, McLuhan (1964/1994) reveals that the content of every medium is another medium, which makes us completely unaware that we are being mediated. In fact, mass media was so overheated in the 1970s that Baudrillard (1983) saw a rupture in the notion of truth and reality, arguing that mass media mediate every aspect of our life.

Nonetheless, mass media encounter challenges posed by digital technologies and new social paradigms. The third section emphasizes the process of media convergence through the development of computational power, information digitization, and the advent of decentralized networks — the Internet deeply affects not only production methods but also the way people access and consume information. Bolter and Grusin (2000) propose that this is a *remediation* process, that is, just a new cycle of mediation where new media reform previous media. Beyond technological advancements, digital media also break with the established mass media logic. Drawing on Deleuze and Guattari's (1980/1987) concept of the *rhizome*, I strive to demonstrate

how the Internet is the image of a networked society, shifting mediation from a 'one-to-many' direction to a 'many-to-many,' resulting, therefore, in an authority crisis in mass media culture.

Finally, in the fourth section I discuss recent developments in digital technologies and their effects on social communication: broadcast decentralization exposes multiple facets of our society once hidden by the filters of mass media agents.

2.3 Chapter 3: Mobile Media and Spatialization

As a consequence of the mass media crisis, new methods of mediation have been emerging with the digital technology revolution. Following the post-mass media paradigm, mobile media use wireless communication systems in conjunction with digital networks to enable massive participation in the production and distribution of information, resulting in a decentralization of social mediation processes. From this perspective, I describe how these increasingly open, collaborative, and customizable media interfaces have been used to interface public spaces, examining the relationship between mobile media and urban space.

This chapter first establishes what comprises mobile media, making the distinction between *portable* and *mobile* technologies, highlighting how mobile devices allow active participation as opposed to the restrictive functionalities of portables. The emphasis is on smartphones, ubiquitous technology in the modern urbanscape, and their affordances to shift perception of space and place: if in the past books and personal music players allowed some interference in the immediate user's surrounding space, today smartphones expand these interactions and enable active participation in the production of space.

Drawing on Farman's (2011) and Silva and Frith's (2012) theories of mobile interface, this chapter examines the relationship between mobile media and everyday life in urban space. I use Lemos' (2008) classification of locative media to explore the current methods people have employed to interact with space: **mapping and geo-localization**, **urban electronic annotations**, **location-based mobile games**, and **smart mobs**. As a result of these activities,

new layers of meaning are added to the space, producing resignification of places by a specific group of people, as well as public reappropriations of space.

2.4 Conclusion: Responsive Attitude and the Near Future

Finally, keeping with my thesis goals, the conclusion provides some clues of how urban computing and locative media practices allow wider participation in the production of space. Mobile media have been shifting cultural practices and have already changed how we experience the city and shape our urban culture. From the ***blasé* attitude** described by Simmel (1903) in the dawn of the twentieth century, where people sought to enclose themselves in their own comfortable space, we began to move toward a more **responsive attitude**, where we have not only the means of direct interaction with our environments, but also more control and power to make social changes. Nonetheless, this shift in the balance of social power relations comes with a contradiction: freedom to participate in exchange for content surveillance, which generates tensions between social agents and raises concerns about location privacy and reinforcement of power relations. The questions of who owns the data, who has access, who controls, and what we can do with such (big) data becomes a (big) issue for both those who provide a service and for those who use it.

Chapter 1: Space and Place

> From the standpoint of the mirror I discover my absence from the place where I am since I see myself over there.
>
> ~ Michel Foucault

How does one answer the question *where are you?* There are, in fact, many different ways: using spatially relative references (*in front of the station*), time (*one hour from downtown*), distance (*10 km from the school*), geographical conventions (latitudes and longitudes: *10° W, 37° S*; postal codes: *T5K 2L8*; place names: *Edmonton, AB, Canada*), or even very personal references (*at home*). With different degrees of fuzziness, the spatial descriptions use terms that ranges from exact locations on the earth's surface to social-cultural produced places with no physical boundaries. These terms are used in everyday life to distinguish and describe social spaces, which, according to Lefebvre (1992), express and constitute spatial practices, that is, specific uses of spaces.

Indeed, the terms space and place go far beyond the definitions used in cartography and geometry. **Space is socially produced** (Lefebvre, 1992) rather than being a neutral environment. In this case, we should consider space and place not only by their physical aspects but also by their abstract and immaterial properties. However, we cannot understand places as a mere mental process of attributing meaning either. Davidson, Park and Shields (2011) argue that places emerge from the "dynamic relationships between humans, things, and environments" (p. 6), producing affective attachments among them. We often recall emotions and experiences not even by a name, but in relation to places and situations. Besides serving as functional locations for events and everyday life, places produce affective attachments to people, events, things, time, and also other places. Thus, instead of simply locating a point or shape in a map, space and place must

emphasize and, in some way, connect the geographic location to a myriad of human phenomena: culture, society, institutions, built environments, and so on.

The noun *home*, for instance, not only indicates a location where one permanently lives, but also reveals emotional bonds. The sense of belonging, for example, indicates psychological states, such as the place one feels safe and protected (*e.g.*, close to their families, inside their houses), as well as social and cultural conditions, such as where one was born and raised (*e.g.*, a neighbourhood, a city, a nation). The same can be applied to built environments, whether large (planned cities) or small (classrooms). At a first glance, shopping malls, for example, are just a marketplace where middle class people spend their earnings. However, according to Shields (1989), shopping malls are a simulacrum of a true urban vitality, in which every architectural aspect is strategically designed to persuade shoppers and enhance the chances of consumption. Similarly, Banff, the city and park in Canada, was recoded from its original unknown wilderness space to a familiar and European identity — all signs of previous occupation were carefully erased, transforming the place into what the advertisers called the "Swiss Alps in North America" (Shields, 1991). These built environments connect their locations with social and cultural desires: it is a hyperreality where everything looks real and therefore it is real. Instead of providing a reproduction that provokes a wish for the original, the reproduction already fulfills all our desires for the original, so we do not need the real anymore. Therefore, as Shields (1989) argues, they are pre-conceived spaces intending to deliver an intense experience of freedom, but are in reality tightly ritualized and highly controlled.

Spatial locations are reappropriated and repurposed all the time according to their social use and everyday practices. A public square, for instance, can serve as an urban leisure space for a city dweller, be transformed into a stage for political conflicts in a moment of crisis (*e.g.*, *Tahrir* Square, Egypt), or carry memories from past struggles (*Tiananmen* Square, China; *Place de la Bastille*, France). Coffee shops are another example: besides serving coffee and snacks, they are places of relaxation, inspiration, socialization, and are sometimes where revolutionary plans are made (Grafe & Bollerey, 2007). They also became one of the many windows to the virtual world

in the 1990s with cybercafes. The social use of media technology, which I will examine in more details in the next chapter, also acts like a lens through which we perceive space: movie theatres transform a two-dimensional wall into a three-dimensional space, and a television brings images from remotes places into the living room. Ultimately, mobile media, which I will discuss in more depth in the third chapter, shifts, transforms, and augments real locations by mixing real and virtual spaces.

As illustrated, a myriad of social-cultural features are embedded in space and place. It is important, though, to consider these two terms as separate entities that are interrelated. In this chapter, I use De Certeau's (2002) notation in which *place* is where the elements are in relation with each other, defining a location where the rules of the 'proper use' are applied. In contrast, *space* is the result of the intersection of operations performed by an agent, or agents, within and through places. For De Certeau (2002), space "occurs as the effect produced by the operations that orient it, situate it, temporize it, and make it function in a polyvalent unity of conflictual programs or contractual proximities" (p, 117).

This chapter addresses the social component of space and will demonstrate that **space is the practiced place**. Although my focus is not to redefine the concept of space, the goal is to build the grounds for a discussion about mobile media. As the use of mobile media happens in space, blending digital data with physical environment, the very notion of space has to be taken into consideration. So, the first part of this chapter examines the concepts of space and place using a sociological perspective to demonstrate how Henri Lefebvre (1992) conceptualizes space in the way that it is shaped as a reflection of a society. Further, I will argue that place is not a mere physical location, but a juxtaposition of social spaces in real places, which sometimes do not match with each other, producing *heterotopias* (Foucault, 1984), such as the cyberspace established by digital media.

It is not unusual to find contradictions, and some times disputes among scholars, regarding the terms *space* and *place*. Lippard (1998) and De Certeau (2002), for example, contradict each other

by using place to describe space and vice versa, recasting the meaning to fit in their particular notion of space. Hence, the second part of this chapter will focus on describing how different authors use these terms, and introduce the concepts of *community*, *mobility*, and *mapping*, which are fundamental for understanding how people conceive, perceive and live the space, as well as grasping how mobile media are shaping our experience of hybrid spaces.

For the modern Western society the ultimate space is the city: super dense urban spaces operating in a network of both material and immaterial commodities (Sassen, 2006). Since the infrastructure that supports mobile media as well as the majority of its producers and consumers are within the urban space, we must define what a city is. Thus, in the third section, I use Mumford's (1937) city typology to explore the concept of a city, its relationship with its citizens, and what it means to live in a city. Their high density and complexity increase the speed of society, producing alternative modes of living and innovative ways of perceiving the space, which eventually challenge and shift a city's dynamic (Lynch, 1964; De Certeau, 2002). One of the newest symptoms of change is the adoption of digital media, in particular mobile media: it introduces a new way not only to interact with the city, but also to reappropriate and virtually augment the urban space.

1. Space

After a long period of society's obsession with time and history in the past, particularly in the nineteenth century, the twentieth century saw the focus change to space and place. For Michel Foucault (1984) we are living an epoch of simultaneity, in which everything is juxtaposed; the relationships between sites have become more important than the structured elements connected through time.

Whilst there is no conclusive definition of space, the concept has a myriad of contrasting meanings across many different disciplines, from geography to literature. For example, "Descartes brought to an end the Aristotelian tradition which held that space and time were among those *categories* which facilitated the naming and classing of the evidence of the senses" (Lefebvre, 1992, p. 1). Lefebvre argues that previous attempts to define space had their own agenda with powerful ideological tendencies. They consist of a very precise way of reinforcing the ideas of the dominant class, resulting in a particular "theoretical practice," producing a mental space with no apparent ideological value. Perhaps this is exactly what Foucault (1984) meant when he said that the theory of space is still not entirely "desanctified."

1.1 Social Space

Lefebvre seeks a "science of space" that bridges the gap between theory and praxis, between mental space (the space of the philosophers and epistemologists) and real space. For Lefebvre (1992), the concept of space must:

> **Represent the political use of knowledge**, that is, how space embodies production relations (in the case of the modern Western society, "neocapitalism");
>
> **Imply an ideology designed to conceal that use** —a blurred ideology with no flags and that is supposedly disinterested, almost indistinguishable from knowledge, designed to hide its principles, but carries its own intrinsic conflicts;
>
> **Embody a technological utopia within the framework of the real**, which means that the future vision of the space will always observe the rules of the existing mode of production and its current level of technology.

Consequently, space should not be considered in isolation. It is neither a mere abstraction (a delineated area on a map), nor a concrete material. In other words, as put by Foucault (1984), "we do not live in a kind of void, inside of which we could place individuals and things" (para. 9).

Rather, Lefebvre (1992) proposes that (*social*) *space is a* (*social*) *product*. That is, social actions produce social space embodying social relations. A city, for example, — including its relationship with other cities, its social dynamic, its dwellers and their lives, and its products and production relations — is a space. Thus, we are constantly confronted by an indefinite multitude of spaces, each one contained within or piled upon another: geographical, economic, demographic, sociological, ecological, political, commercial, national, continental, global, and so on.

What Lefebvre (1992) proposes is that we consciously produce space and, as with other such conscious social products (culture, knowledge), that space is used as a means of social control by the hegemonic power. Lefebvre's theory generates important consequences: (1) **natural space disappears**, (2) **every society produces its own space**, (3) **knowledge is reproduced in space exposing its process of production**, and (4) **the history of space is not a causal chain of historical events**.

While most of the time people perceive a space as neutral, or even empty, Lefebvre (1992) argues that it is just an illusion of transparency, a dissimulation of a well designed space created exclusively to be an invisible mediator between mental activity and social activity. They are built upon social codes, which means that they always signify something, even if one cannot decode the meaning. However, spaces can also fail to explicitly signify anything, especially those overburdened with meaning: "'oversignifying' spaces serve to scramble all messages and make any decoding impossible" (Lefebvre, 1992, p. 160).

Space then, is not a prior, neutral, or passive canvas for social relations, but an active force in defining them. Each society, or, more precisely, each mode of production, along with its specific relations, produces a space — its own space. Therefore, a space reflects values, ideologies and power structures of a society as it re-inscribes and legitimizes them. Capitalism, for instance, replicates itself through a variety of channels, including social construction of space such as architectural design, physical construction (buildings, monuments), and marketplace as a site for exchange of commodities. The ultimate goal is the perpetual reproduction of the established

social relations of production, ensuring legitimization of its own ideology while delegitimizing other perspectives. In this sense, conditions of daily urban life become key for the evolution of revolutionary politics, such as Marxism and the current protests against Capitalism around the world, including the **Arab Spring** (Middle East), **Occupy** (North America), ***#vemprarua*** (Brazil), among others.

Nevertheless, Lefebvre (1992) indicates that in order to claim to be 'real,' any 'social existence' has to produce its own social space, otherwise it would become folklore or even disappear — perhaps this is what happened to what is called 'Socialism.' Lefebvre (1992) argues that Socialism did not achieve its full potential because it did not produce a new space, its own space: "what is an ideology without a space to which it refers, a space which it describes, whose vocabulary and links it makes use of, and whose code it embodies?" (p. 44), asks Lefebvre. Although the question makes sense, he admits that it also implies that we, limited and confined with our Western concepts as tools, are unable to fully comprehend other modes of production, such as the Asiatic, due to both our lack of understanding of how these spaces operate, and the difference between these spaces and our own.

If we are aware that space is a product, we can certainly reproduce and expose this knowledge in its process of production. Lefebvre (1992) defends that both products located in space — object and discourse — supply information about the process of space production. They are, however, pieces of a puzzle: each piece cannot reduce and represent the whole picture, but, if concatenated, they might reveal the global space in its totality. Hence, the concept of a space is made up not only by the analysis of its parts, but is also caused by and a consequence of a theoretical understanding. Ultimately, objects and places can provide clues to, and testify about, their production process, but are not sufficient to explain their global aspects. We must shift our attention to the actual production of space, that is, the ideological process that is both the foundation and outcome of the produced space: it is a dialectical operation where the "theory reproduces the generative process ... from within, not just from without (descriptively), and globally — that is, moving continually back and forth between past and present" (Lefebvre, 1992,

p. 37). Accordingly, the historic consequences and significance of a particular site are inscribed in space — the space is always past and present, now and then.

Built between 1907 and 1913, the Legislature Building in Edmonton (Fig. 1.1), is an example of how the process of production (concept) is as present as the concrete portico supported by six massive columns (objects). It was built not only to be the center of political power in Alberta (Canada), but also as a symbol of both the presence of the state and democracy. The architectural project, inspired in the State House of Rhode Island (USA), suggests power, permanence, and tradition. The production process and the product are, therefore, two inseparable aspects of the same space.

Hence, if space is produced and there is a productive process, then there is also a historical process. According to Lefebvre (1992), the history of space is neither a casual chain of events nor a sequence of ideology, socioeconomic structures and institutions. The movement from one mode of production to another implies the constitution of a new space, though its history cannot

Figure 1.1: Legislature Building in Edmonton, designed in Beaux-Arts style to be the centre of power of the province of Alberta, Canada.

be limited to special moments such as formation, establishment, decline and dissolution of a given society. It must be understood, instead, in its global aspect, "with modes of production as generalities covering specific societies with their particular histories and institutions" (Lefebvre, 1992, p. 48).

Considering the four implications discussed above, Lefebvre (1992) proposes that social space contains three interrelated levels:

> **Spatial practice**, which embraces productions, particular locations, and spatial sets from each social formation;
>
> **Representation of space**, that is, the space planned and imposed by the hegemonic power and closely tight to the relations of production;
>
> **Representational space**, where the everyday practice transforms the planned space "embodying complex symbolism, sometimes coded ..., linked to the clandestine or underground side of social life" (p. 33).

Spatial practice is the dialectical interaction that propounds and proposes the spatial relations — that is, space practice is the synergy between the production and use of particular locations. De Certeau (2002) identifies this dialectical interaction as relationship between the 'proper' use of things and the ordinary usage: it is exactly this tension that defines places and regulates life. This is the case in Western society, under the logics of capitalism, where the spatial practices embody paradoxical relations between the private and the productive life. Although they seem to be integrated, there is an extreme segregation between these places, ultimately implying a lack of coherence.

Representations of space, created by scientists, planners, urbanists, technocrats, and social engineers, "all of whom identify what is lived and what is perceived with what is conceived" (Lefebvre, 1992, p. 38), is the dominant space in any society. For De Certeau (2002)

this is the *strategy* that the constituted power uses to define what is proper, serving as the basis for political, economic, and scientific rationality. Its influence in the production of space happens not only through architectural construction, that is, building physical objects, but also as a technique to assign significations to spatial context in such a way that 'representations' will not disappear into the symbolic or imaginary realms.

Representational space, on the other hand, is produced by everyday life through ordinary people's experience, perception, and action. Lefebvre (1992) describes it as the dominated space, though it is also the space of reappropriation, where symbolic meanings overlay the (planned) physical space. As opposed to verbal signs, representational spaces use more or less coherent systems of nonverbal symbols and signs (music, art, performance, protests). For De Certeau (2002), representational space is also the space of *tactic*, where people customize, adapt and transform the 'proper' logic of things. People subvert space "not by rejecting or altering them, but by using them with respect to ends and references foreign to the system they had no choice but to accept" (De Certeau, 2002, p. xiii). The practice of everyday life creates small modifications of and within the dominant culture in order to make it suitable to the user's own interest. De Certeau (2002) suggests that these fragmentary transformations do not occur by chance, but that there must be logic in these practices. They do not lack ideology or rules; they are governed by some set of principles connected to the consumer's activity, culture, tradition, agency and anxiety.

Finally, Lefebvre (1992) sees these three levels of spaces as a triad: *perceived*, *conceived* and *lived*. Spatial practice presupposes the use of the body in the physical space, in which we use our sensorial organs to perceive and interact with the space. Representation of space is conceived from accumulated scientific knowledge, disseminated with a combination of ideology. Representational space is lived and experienced through the symbolic system and the apparent immediate intervention of culture.

1.2 Space Non-space

Spaces are always related to the body and to all other spaces. Nevertheless, some sites hide and even contradict this relation. One of these sites is called utopia: 'sites with no place' where the relations with the real world are inverted, generally presenting themselves as a perfect form of the society. Foucault (1984) proposes that utopias, in some way, can also be enacted in real space, though they are very different from all other sites reflected by them. In this case, utopia becomes *heterotopia*, a place where the relationship between human dimensions cannot objectivity seen in the real space, but it is present through sensorial dimensions in the human experience, even if it is contradictory and make no sense a priori. According to Foucault (1984), a heterotopia follows a set of six principles:

It is common to all cultures in the world, though not constant and homogenous. Foucault exemplifies with two categories of heterotopias: crisis and deviation. It seems that the prior prevails in the so-called primitive societies, as "there are privileged or screed or forbidden places, reserved for individuals who are, in relation to society and the human environment in which they live, in a state of crisis" (Foucault, 1984, para. 15)— for example, adolescents and the elderly. In the modern western society, these spaces have been replaced by heterotopias of deviation, "those in which individuals whose behaviour is deviant in relation to the required mean or norm are placed" (Foucault, 1984, para. 16), such as psychiatric hospitals, prisons and retirement homes.

Each society defines a precise function for its heterotopias. The cemetery, for instance, was (physically located at) the heart of the city in the eighteenth century, when there was a strong belief in resurrection. It is a space that has connections throughout society, since the families have their relatives buried there. However, in the beginning of the nineteenth century, a cemetery was considered a place of illness and was moved to the boundaries of the city. Consequently, cemeteries ceased to be the sacred heart of the city and became 'the other' city, where families have their small and dark resting place.

A single real place is capable of overlapping several incompatible sites. The theatre and cinema are certainly the best contemporary examples. They transport the audience to different spaces by successively overlapping different places, often not connected to each other, on either stage or screen.

Heterotopias are often tied to time frames. Take the example of museums or libraries: they are places of accumulation that strive to establish an archive, enclosing all epochs in one place. According to Foucault (1984), they are places "in which time never stops building up and topping its own summit" (para. 22). On the other hand, there are also heterotopias connected to flowing and transitory aspects. Festivals and fairs, for instance, occupy an empty space in the city for a brief period of time. The transitory condition of transportation and mobility, such as bus stop, airports, and train stations, can also be considered heterotopias of the flow.

They are at the same time isolated and penetrable. That is, generally heterotopias are not easily or freely accessible like a public place. This is not to say that there is a gatekeeper; everyone can get inside these heterotopic spaces. Nonetheless, as put by Foucault (1984), "either the entry is compulsory, as in the case of entering a barracks or a prison, or else the individual has to submit to rites and purifications" (para. 25).

They act as a way to either expose or replace real spaces. In the first case, an illusion is created to uncover the very truth of every real space. Foucault points out that perhaps that was the role played by old brothels, in which the false illusion of freedom revealed the contradictions in the social private life. The latter is a heterotopia of compensation, where the space produced is as perfect as our messy real space. The colonization of new territories are examples of these spaces: on both Puritan societies living in North America and Jesuit colonies in South America, "Christianity marked the space and geography of the American world with its fundamental sign" (Foucault, 1984, para. 27).

Foucault (1984) believes that "our experience of the world is less that of a long life developing through time than that of a network that connects points and intersects with its own skein" (para. 1). Ergo, the same intrinsic levels described by Lefebvre can be found in heterotopias. They are social spaces that overlap real spaces, though they are not the consequence of the collapse or exhaustion of a given place. Rather, heterotopias can be seen as new spaces being lived, as in the case of a performance enacted in a public place, for example modern "smart mobs" and the intense use of augmented realities by digital technologies, which I will discuss in the third chapter. They can also be seen as conceived spaces, such as shopping malls. When Shields (1989) describes how built environments (*e.g.*, shopping malls) are conceived, he was surely picturing a heterotopia: it is a hyperreality where everything looks real and therefore it is real. Instead of providing a reproduction that provokes a wish for the original, the reproduction already fulfills all our desires for the original, so we do not need the real anymore.

2. Here and There

The terms used to describe the concept of space are no less a convention than the concept itself. *Space* and *place*, the most abstract of them, are the cause of some debate among scholars, sometimes producing inconsistencies and problems in understanding. The same happens with more specific, but no less conceptual, terms such as *community*, *mobility*, and *mapping*. Authors may sometimes contradict each other, recasting the meaning to fit in their particular notion of space. This section will explore how some authors describe and use these terms, in order to establish the grounds for the discussion about mobile media and space in the third chapter.

Place and space do not exist separately from one another. Rather, they exist in parallel, and even rely on one another to signify locations; they intersect, envelop, and consume each other. Although in everyday life these terms are synonyms and generally can be used to specify a location, scholars use them to define particular aspects of lived spaces. De Certeau (2002), for

instance, distinguishes space from place, arguing that *place* is where the rules of the 'proper use' are applied and the location is defined. It is also where elements are in relation with each other — these elements do not overlap, but instead rely on one another. In contrast, *space* is a geographic location with coordinates, emerging "when one takes into consideration vectors of direction, velocities, and time variables" (De Certeau, 2002, p.117). Thus, space is the intersection of predefined places by the operations of movement and human interference: town planners define streets as a place to become a space through human activity such as walking, for example.

With another point of view, Lippard (1998) defines *place* as the union of *spaces* (physical or experimental) and culture. This hybrid and social space is produced by the combination between nature, historic moments, and human activity. Lippard's (1998) argument involves two other important concepts: the *landscape*, and the *local*. Landscape is, at a very basic level, everything that one sees around, especially for outsiders. Hence, foreigners could only comprehend a landscape when they enter a new place, though this action makes them one of the ingredients in an existing hybridity, which in consequence slightly changes the placement question. According to Lippard (1998), this is exactly what all local places consist of. As place is a hybrid construction made by those who live inside, people from varying places could have different feelings and connections with the local, which can range from a utopian dream to a cruel reality, or may never be acknowledged at all. Lippard (1998) defends that local is "the intersections of nature, culture, history and ideology" (p. 7), and contains the concept of place: a portion of space that is known and familiar when seen from inside, connecting personal memory and histories.

Lemos (2010) has another perspective in which places are configured based on the dynamic relationship between *territories* and *territorialization*. Territories are areas of control, not necessarily physical, but usually with boundaries, where mobility and flow come into existence. Surveillance is a form of monitoring and tracking movement within territories to keep the boundaries. Territory is, therefore, the space where action happens — the practiced space. Territorialization, on the other hand, is the act that signifies a place. In other words, it is the representation of space, where producers conceive and dictate the 'proper use' of the space.

Furthermore, Lemos (2010) defends that a territory's significance rests on the tension between borders, between what is inside and what is outside. Thus, territory becomes a communication problem defined by social relations— limits, access, control, and exclusions. Communication is always a relation between two or more parts implying an understanding, comprehension, agreement, or the opposite: "communication is a process of deterritorialization within the borders, as well new territorialization within territories" (Lemos, 2010, p. 409). Therefore, we can translate the concept of place as the whole location that humankind acts on, and space as an 'event' that occurs in places, which is produced by territories and permeated by its internal dynamics.

Finally, place and space are distinct concepts with regard to material and immaterial (virtual) aspects. This distinction made by Lefebvre (1992) identifies two kinds of space: social and physical. *Social space* is defined as a set of relations between things that "overlay physical space, making symbolic use of its objects" (Lefebvre, 1992, p. 39). *Physical space* is the geographic location and material that exists within a place. As a result, places have spaces and spaces can exist in places or spaces.

De Certeau (2002) goes further and defines space as the intersection of places (locations) by the operations of movement. In other words, *space is the 'practiced place,'* where the walkers appropriate the urban geometrics (places), transforming them into a space. Thus, the constant (re)appropriation of spaces and places produces a persistent cycle, transforming places into spaces or spaces into places (De Certeau, 2002; Lemos, 2010). Lippard (1998) adds that place can also be filled with emotions and illusions — particular experience transforms specific sites. Hence, everyday social activities and practices produce experience in place, which form communities and constitute a collective meaning of a place.

2.1 Community

Generally, we tend to say that culture defines spaces, though Lippard (1998) defends that a space also defines and gives meaning to culture. According to her, the meaning of *land* for non-land-

based people goes beyond the physical location: it is an idea, which includes ideology and metaphor to the physical sites. The result is a separation between nature (location) and humankind (culture) by means of technology. On the other hand, land-based people live on and have their emotions attached to the land. In Lippard's (1998) words: "land is an amalgam of history, culture, agriculture, community, and religion, incorporating microcosm and macrocosm — the surroundings further than the eye can see, and the living force of each rock, blade of grass, small animal, or weather change" (p. 14). Nature is, therefore, indivisible: "no matter how far culture will go to destroy its connections to nature, humankind and all of our technology, good and bad, are inextricable parts of Nature" (p. 11), concludes Lippard (1998).

Lippard (1998) asks: "If place is defined by memory, but no one who remembers is left to bring these memories to the surface, does a place become noplace, or only a landscape?" (p. 23). While memory is our capacity to remember the history and make meaningful connections with past experiences, social memory is not only present in one's thoughts, but can also be imbued in the space itself. Although she argues that every place is a landscape (a place without meaning or an empty space) for outsiders, the same place contains and reflects aspects of social practices of the local society, which can transmit memories and stories from a culture that no longer exists. Nostalgia could recover or re-enact spaces from the past, bringing back forgotten places.

Thus, the term community signifies the relationship between people and a certain place. Note that this is neither humankind acting upon a location (assigning meaning to a place) nor the imposition of the place's aspects over a group of people. Rather, a dialectical relationship composes a hybrid and multilayered interconnection of stories that cannot be seen in a linear fashion. Lemos (2010) believes that "community is a social pre-urban form, and only remains today in identity aggregation and subculture, as a reaction against the societal breakdown" (p. 415). Indeed, De Certeau (2002) and Lippard (1998) agree that community is the 'practiced space' where dwellers appropriate urban geometrics (places) in an attempt to create meaningful spaces for themselves.

2.2 Mobility

Tiessen (2008) states that mobility "has become a most suitable trope for our time, an era accelerating at what seems to be ever faster rates of speed, an era penetrated by pervasive and proliferating technologies and riven with the effects of neoliberal economics" (p. 112). Though mobility is a trend receiving particular attention from social and technology theorists, the concept is not new. Leibniz (1646-1716) observed once that all things "are, like 'rivers, in a perpetual flux; small parts enter and leave them continually,'" suggesting that "'the very substance of things' consists in 'their force to act and be acted upon'" (as cited in Tiessen, 2008, p. 114). As an inherent human condition, mobility brings together communicative, technological, geographical, economical, cultural, and social issues.

The contemporary emphasis on mobility reflects the sense that today's cities exhibit more of just about everything: they move at greater speed, their inhabitants travel further, they absorb and produce more varieties of analog and digital information, they (in many instances) welcome more immigrants, they are crossed by ever more goods and services: focusing on quantity rather than on quality. Mobility is multivalent and can be described as a set of flows, such as vehicle traffic, everyday work, and exchange of information. Lemos (2010) classifies mobility in three categories: (1) **physical or spatial** (*e.g.*, material transportation), (2) **virtual or informational** (*e.g.*, media), and (3) **cognitive or imaginary** (*e.g.*, thoughts, beliefs, dreams). He also describes three types of interactions among them: (a) **replacement**, that is, when one erases the other (*e.g.*, digitization of physical documents); (b) **complementariness**, that is, using one category to get to another (*e.g.*, food delivery), and (c) **additivity**, when two categories occur at the same time (*e.g.*, transmission of ideas and ideologies through media discourse).

Mobilities can be interrelated, with interdependent trajectories within a network, moving across space and time, and their content can be material (car, trains, goods, people, values) as well as immaterial (ideas, memories, values, emails). The relationship among the material and immaterial is often disrupted when their speeds are different. An idea, for instance, may never

flourish due to material constraints; an infrastructure improvement could never arise because of a disadvantaged political paradigm. When we move through space, we create what Tiessen (2011) calls *desire lines*. He explains the concept following De Certeau's (2002) approach of strategy and tactic: "desire lines are identified by architects or urban planners as those footpaths we all contribute to when our strolling deviates from the preplanned directional imperatives such as paved walkways" (Tiessen, 2011, p. 127-129). Nevertheless, he also admits that desire lines are more complex than the simple individual desire to forge them. Rather than just human agency, they are a result of the relationship between the agent and the environment —what Deleuze and Guattari (1980/1987) call an *assemblage*.

2.3 Mapping

Harpold (1999) observes that all cultures record their experiences using maps, especially for managing spatial and political complexity. We commonly see maps as representations of physical location without noticing their specificity and conventionality. Nonetheless, they are full of heuristic methods, persuasive interests, and hegemonic ideology layered on top of political and economical formations in order to perpetuate a dominant discourse. Maps depict a selective distortion of the information available to those who design them. Mark Minmonier observes that maps "mislead their users, if (1) the maps are to be legible at all, and if (2) the maps are to address the specific purposes for which they were designed" (as cited in Harpold, 1999, para. 11). The first condition has to do with the limitations of the map support (paper, screen) and the human eye: details have to be omitted or altered in favour of legibility. The second condition has to do with the intentionality of the map: the distortion could improve the efficacy toward a particular end. The Mercator projection, created in the sixteenth century, is helpful for sea navigation, although it distorts regions near the poles, making the Greenland much bigger than Brazil, for example.

The bounded shapes of cartographic representation are conventions, historically determined signs, rather than visual analogues of real terrains. Natural barriers such as mountains and rivers are not respected and normally fixed or erased by political strategy, technological intervention,

or military conquest. The geometric mosaic that constitutes the political map, for instance, is a convention of signs that we learn to recognize as the representations of the nations. Thus, "users of maps depend on them to discover unities and identities across space and time that are meaningful first of all **because they are mapped that way**" (para. 17), argues Harpold (1999).

Cartographic conventions create misrepresentations, which are tied to an "unrepresented structure of established and emergent political economies that is mistaken for the given" (Harpold, 1999, para. 18). Nonetheless, Harpold (1999) points out the possibility to act against the traditional methods of map-making with counter-mapping actions. As Kevin Lynch (1964) states, the boundaries and identity of a region are not singularly defined by the constituent power, but culturally produced by its dweller. Thus, instead of using institutional political conventions, different results could emerge if people designed their own maps using contextual information, which I will demonstrate in the third chapter.

3. Downtown

To put together all the main concepts discussed above in a tangible way, this section explores how they interact in a highly complex and dense space: a city. An urban space not only materializes in buildings, houses and streets, producing a unique image of its own space, but also aggregates a myriad of immaterial interactions, such as cultural and social activities, generating a fertile and dynamic environment for human relations: it is where people cluster, organize and act to establish new forms of sociability, identity and values. Most important for this thesis, though, is that the city has the infrastructure that supports mobile media as well as the majority of its producers and consumers. It is important then to establish the modern concept of cities and what their roles are in the contemporaneity.

To a shallow examination, a city is nothing more than a limited and densely populated area with permanent structures where groups of people, not necessarily related to each other, live in communities and support themselves through economic organizations. Cities have two essential characteristics: **physical aspects**, such as a fixed site, durable shelters, and permanent facilities for assembly, interchange, and storage; and **social features**, such as division of labour, which regulates not only the economic life, but also cultural processes. The city is, therefore, an institutional process operated through networks of material and immaterial relations. For Mumford (1937), "it is in the city, the city as theater, that man's more purposive activities are focused, and work out, through conflicting and cooperating personalities, events, groups, into more significant culminations" (p. 94).

As an institution, the city replaces personal face-to-face interaction making citizens themselves multi-faceted. It is in the city that the individual self almost disappears in favour of a wider participation in collective life. As put by Mumford (1937), "what men cannot imagine as a vague formless society, they can live through and experience as citizens in a city" (p. 94). Hence, a city's physical space (buildings, paths, bridges, monuments, parks) is both a symbol of society's achievement and the foundational canvas where the urban social space (culture, economy, politics) is drawn. Nonetheless, Mumford (1937) affirms that, "when the physical environment itself becomes disordered and incoherent, the social functions that it harbors become more difficult to express" (p. 94). In consequence, people assume a *blasé* attitude, a phenomenon described by Simmel (1903) resulting "first from the rapidly changing and closely compressed contrasting stimulations of the nerves" (p. 413). That is, the intensity and fast pace of urban centres produces contradictory events in which people become incapable of experiencing new sensations with the appropriate energy.

3.1 The Urban Space

Mumford (1937) argues that social aspects have to be seen as precedent to the city's material infrastructure: "the physical organization of a city, its industries and its markets, its lines of

communication and traffic, must be subservient to its social needs" (p. 94). Thus, to understand what a city is we must consider not only its physical properties, such as landscape and architecture, but also its immaterial aspects, such as its social dynamics, culture, economy, urban processes, tensions, and contradictions. Using Mumford's typology, we can delineate the concept of city around five elements:

Environment – a city is not qualitatively different from agricultural spaces, since both are socially constructed in which humans transform and control nature, usually by producing permanent structures. This perspective shows that the city is nothing more than an urban village, where the landscape is transformed for human living.

Density – Mumford acknowledges the city as a social space in which "the density of social activities and material artifacts gives a new speed and intensity to life" (Steinberg & Shields, 2008, p. 6). That is, the concentration of people creates greater possibility of interchange and new combinations of relationships, by consequence accelerating the society. Although there are structural problems concerning the size and density of the urban space, dense places are crucial for capital production and consumption, as well as political and social infrastructure.

Hearth – A city's architecture and urban formation are repositories of memories and meaning. Thus, its buildings and pathways imprint and preserve the culture and history of a particular society.

Complexity – Mumford compares a city with a symphony: "specialized human aptitudes, specialized instruments, give rise to sonorous results which, neither in volume nor in quality, could be achieved by any single piece" (as cited in Steinberg & Shields, 2008, p. 7). In the same fashion, the city is a place of social and technological innovation, leading to intense specialization, which pushes for further innovation. Urban space becomes central to raising productivity and the overall 'progress' of society.

Hub – Mumford (1937) sees the city as a cosmopolitan hub, also referred by Lefebvre (1992) as social centrality. Urban places leave behind old traditional values and embrace different (sometimes strange) alternatives modes of living. Cities become nodes in a network (Sassen, 2006), where the flow of people, commodities, and ideas are always transforming and reforming identities and cultures.

The city is the utmost achievement of humankind upon nature. Its permanent physical structures favour social densification enabling complex social interactions. It is through urban space that different groups of people have the opportunity to establish not only new social relationships, but also to free themselves from traditional values. Consequently, cities produce their own space, the urban space, crucial for capital production and consumption. The city is, therefore, the practiced space of modernity, where every block is conceived (representation of space) for determined purposes, but also lived (representational space) according to the diversity of its dwellers.

3.2 Global Cities

In a broader view, the city is also an actor in the construction of spaces, especially in the contemporaneity. Sassen (2006) argues, "the formation of inter-city geographies is contributing a critical infrastructure for a new global political economy, new cultural spaces and new types of politics" (p. 27). The inter-city geographies are also known as *global cities*, easily identified not only by their dense material aspects, such as the flow of people and goods, but also by their immaterial production and exchange, such as the financial trading network. These cities become strategic political-economic nodes in a multidirectional worldwide network, often revealing intrinsic contradictions of capitalism. New York, for instance, leads the financial trade on coffee but does not produce a single bean.

Shields (2011) claims that places have relations with other places: "they are all embedded in a network or spatialization that casts places in a qualitative light" (p. 105). Many of these global cities and trade networks have long existed, though Sassen (2006) defends that they have been proliferating and increasing in complexity in the last 30 years. In these cities, the interaction of

centrality, density and productivity are essential to support and develop a "set of activities for the management, service, design, implementation and coordination of the global operations of firms and markets" (Sassen, 2006, p. 27).

The establishment and development of global processes and markets have massive consequences for large urban spaces. These cities are characterized by their high profile infrastructure in (1) **architecture and urban planning**, with state-of-the-art office districts, airports, hotels, services and residential complexes, producing a very homogenized urban landscape; (2) **transportation and transit**, with a well served public transportation systems like subway, train, bus, and airplane; (3) massive spending on **information technology** focusing on public surveillance and digital networks; and (4) **culture**, especially with strong investments in tourist destinations, such as museums and monuments. The massive scale of these urban systems is very self-centered, in which every space has a specific function with a 'proper use,' challenging representational space and favouring the representation of space.

It is curious though, that in the digital age, when technology has granted remote communication allowing massive infrastructure dispersal, concentration of top level resources becomes extremely intense in a limited number of places: a network of about 40 major global cities. Certainly, these cities also concentrate a big portion of the digital infrastructure, embedding technical artefacts in urban places (buildings, traffic systems, houses, over and under ground), gradually transforming them into actors in the networks through which we move. However, whereas Sassen (2006) refers to global cities, in a very specific way, the result of this process is also true for all cities. The city becomes the potential site "where all these systems can become visible, a potential further strengthened by the multiple globalities — from economic to cultural to subjective" (Sassen, 2006, p. 29).

In spite of the increasing demand on urban space by powerful actors, causing general displacement (especially with privatization of public spaces and process of gentrification), urban space becomes politicized in the process of rebuilding itself. The movement for access and

fairness materializes itself in the city: accessibility, public space (not only public access), good neighbourhoods, public transportation, and, above all, the right to a city.

3.3 Urban Reappropriations

According to Lynch (1964), cities have a stable outline over time, but that outline changes everyday in its details. There is no final result, he argues, just a succession of stages in which control is only partial. Although Lefebvre (1992) asserts that there is a conceived level in the production of space, that is, a strategy of 'proper use' that governs the space, De Certeau (2002) and Lynch (1964) agree that the image and experience of the city cannot be fully controlled. It is rather a mirror of its inhabitants' perception of the city: "the visual sensations of colors, shapes, motion, or polarization of lights, as well as other senses such as smell, sound, touch, kinesthesia, sense of gravity, and perhaps of electrical fields" (Lynch, 1964, p. 3). All these sensorial orientations produce a mental image of the city, which is fundamental in giving us a notion of direction.

For De Certeau (2002), ordinary people experience the city by walking: they write, or create small interferences in the proper path, but are not able to read, or consciously understand what they are doing. The only way to see the "stories" people are telling is from the rooftop of a high building — the bird's eye gives the necessary perspective to see how the city is produced by many small interferences in the public space. Millions of tiny little stories, inaudible to a consumer-producer, but that constantly change the city. Pedestrians try different paths, creating shortcuts, suppressing barriers, and avoiding surveillance. It is almost an act of resistance against the structured power, a voice from below in opposition to repression. Ultimately, it "seems possible to give a preliminary definition of walking as a space of enunciation" (De Certeau, 2002, p. 98): geometric urban spaces can be understood as the 'grammar,' or the 'proper use' of the city, which is used by people to *write* in space; 'walkers' leave their traces in the city as a manifestation at the symbolic level, sketching their own rhetoric style. In De Certeau's (2002) words:

> The long poem of walking manipulates spatial organizations, no matter how panoptic they may be: it is neither foreign to them (it can take place only within them) nor in conformity with them (it does not receive its identity from them). It creates shadows and ambiguities within them. It inserts its multitudinous references and citations into them (social models, cultural mores, personal factors). (p. 101)

According to Lynch (1964), the process of production of these stories is comprised of three components: **identity**, **structure**, and **meaning**. The first component requires distinction and identification of different entities. The structure defines the space or pattern relationship between the entity, observer and other objects. Finally, the observer fills the entity with meaning (emotional or practical), creating a picture of the environment. Accordingly, the coherence of the image has less to do with the physicality of the place and more to do with an abstract feeling, which gives "identity and organization through long familiarity" (Lynch, 1964, p. 6). Although each person pictures the city in a unique way, the general perception is built from many individual stories, the small modifications created by everyday life as De Certeau (2002) notes, which produce the public image of any given city.

Thus, the practice of everyday life creates small transformations of and within the dominant culture in order to make it suitable to a user's own interest. De Certeau (2002) argues that these fragmentary transformations do not occur by chance, but there must be logic in these practices. They do not lack ideology or rules; they are governed by some set of principles connected to a consumer's activity, culture, tradition, agency, and anxiety.

4. Summary

I would like to return to my initial rhetorical question: *where are you?* The way one answers this question always has a cultural bias. Since we understand space as a social product of our society, a

place exists through its meaning. Even the most objective and precise location systems, such as a map's latitude and longitude coordinates, are based on social distortions. For instance, in Western society *North* is a metaphor for up, better and developed. Maps are designed to show Europe, North America and Asia on the top, and South America and Africa on the bottom. This choice has further subjective implications producing a domination relationship: North is civilized, rich, developed and erudite, as opposed to the savage, poor, underdeveloped, and ignorant South. The famous illustration by the Uruguayan modernist plastic artist and art theorist Joaquín Torres-García (Fig. 1.2) shows South America's map upside-down, inverting the Western world's view: the south pole is on top, making its counter part north be on the bottom. This simple transformation deeply affects the way we perceive and move in space: territories can be contested, different commercial routes strategized, new relationships developed with geographic shapes (Italy's outline map would not resemble a boot, for example).

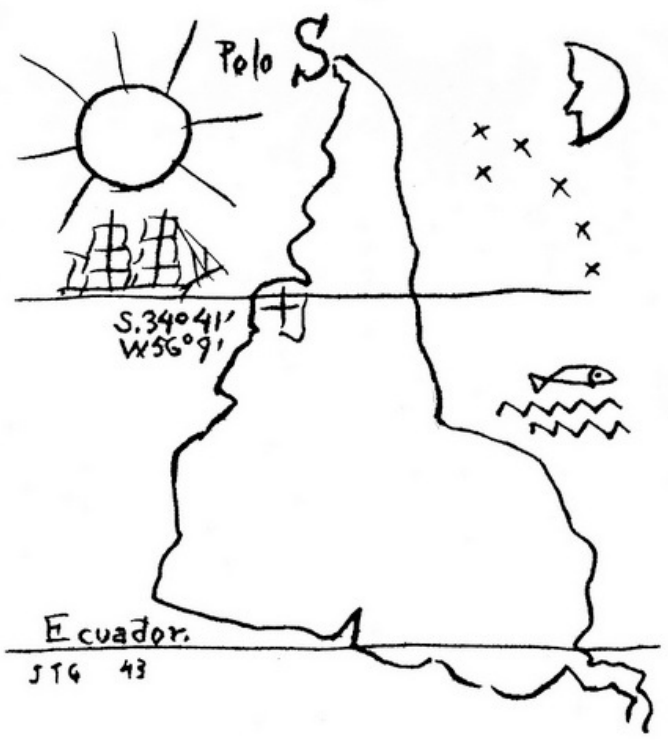

Figure 1.2: *América Invertida*, 1943. Paint on paper. 22 x 16 cm. Joaquin Torres Garcia (Montevideo, Uruguay, 1874-1949). Fundacíon Joaquin Torres Garcia, Montevideo.

Ergo, instead of simply locating a point or shape in a map, space and place must emphasize and, in some way, connect the geographic location to a number of human experiences, such as **psychological** (*e.g.*, sense of belonging in relation to a house, city, or country), **cultural** (*e.g.*, spiritual ritual and purification at sacred places), **social** (*e.g.*, the various roles that a coffee shop can have in the society, from a place to relax and drink coffee, to a window into cyberspace or a sale point for illegal drugs), **political** (*e.g.*, civic manifestation on the streets), and **institutional** (*e.g.*, school and apprenticeship). As Lefebvre (1992) proposes, space is a social product, just like culture and knowledge. Space is also means of control, surveillance and violence used by the hegemonic power to keep the status quo unchanged — it represents the political and resistant use of knowledge.

Each society produces its own space based on its own rules, culture and system of production. The three interrelated levels proposed by Lefebvre (1992) reveal how space affects and is affected by different social actors. **Spatial practice** entails the specificity of each physical location and its social formation. Though it does not create or define a place, the synergy between these elements regulates life, which is exactly how people perceive the space. The **representation of space**, closely attached to relation of production, is conceived by dominant hegemonic power (through urban planners, politicians, scientists, and so on), by means of *strategies* (De Certeau, 2002) to define what is 'proper' to each space and to assign meaning to a place. **Representational space** is not only the dominated space, but also the lived space, where people's everyday life constitutes *tactics* (De Certeau, 2002) for a constant reappropriation, transformation, and change of uses and proper meanings of space.

Lefebvre argues that each person creates her own space in which she belongs and which she owns at the same time. People experience the world in a practical-sensorial way, perceiving it through smells, tastes, touch, hearing and sight, producing "a space which is both biomorphic and anthropological" (Simonsen, 2005, p. 4). Thus, one is not outside a space, but always carries the space and its mode of production. Space is not an object, or static; rather, it is dynamic and in constant interplay with other spaces.

Space and place are, therefore, inseparable: *place* is where the elements are in relation with each other defining a location where the rules of the 'proper use' are applied; *space* is the result of the intersection of operations performed by an agent, or agents, within and through the place. Space and places are social manifestations, planned or unintended, produced by human agency, resulting in a relationship between the agent and the environment. This relationship is more complex than an individual desire to forge it. Rather, it is shared and multidimensional, oftentimes contradictory, forming what Deleuze and Guattari (1980/1987) call *assemblages*.

Consequently, the relations among agents in a given environment also produce another synergy: local communities are composed of multilayered, interconnected stories. Dwellers act in a way to transform their place into something meaningful for them, though not always with common goals. Again, this is not necessarily a material object — it does not need to shift physical landscape. A small gesture, such as a walk in the city, or a simple cultural expression, is enough to rearrange the practice of space.

Nonetheless, it is in the urban space, the ultimate portrayal of modern capitalist Western society, with its production relations and social contradictions, that these transformations are more intense. Global cities, strategic nodes of the contemporary economy according to Sassen (2006), concentrate both material infrastructure and immaterial production aiming to support the unsustainable financial trading network of global commodity chains. The (urban) space produced by these institutions becomes more important than human relations, creating social distortions and cultural displacement. Consequently, as Lefebvre (1992) argues, "the combined result of a very strong political hegemony, a surge in the forces of production, and an inadequate control of markets, is a spatial chaos experienced at the most parochial level just as on a worldwide scale" (Lefebvre, 1992, p. 62-63).

In the beginning of the twenty-first century the production of space is, therefore, concentrated in urban spaces and "subordinated to a centre or to a centralized power ... which works as power's proxy" (Lefebvre, 1992. p. 9). It is the digital infrastructure in these cities, which is considered the

core asset to economic globalization, that reveals itself as potential instrument in the process of space reappropriation. Mobile media, which I will discuss in more depth in the third chapter, produce a digital layer that crisscrosses and overlaps the physical landscape, introducing new ways not only to interact with the city, but also to reappropriate and virtually augment the urban space, ultimately creating new forms of heterotopias (Lemos, 2010). This 'cyberspace' is the new territory in which communities are quickly formed and dissolved with great diversity of interests: political, economic, cultural, personal, and above all, social.

Chapter 2: The Crisis of Mass Media Culture

During the twentieth century, mass media developed from mechanical to electrical form, extending the capability of society to communicate and deliver information. By standardizing, storing, and broadcasting information on a massive scale, radio, film and television had social and cultural consequences. Since the beginning mass media has been controlled by the *bourgeoisie* (a small number of groups of people — usually families — with financial and political power), who use it as a way to keep control of the means of production (Baudrillard, 1983; Benjamin, 1936/2008b; Enzensberger, 1970/2003; Nichols, 1988/2003). In fact, Enzensberger (1970/2003) observes that "monopoly capitalism develops the consciousness-shaping industry more quickly and more extensively than other sectors of production" (p. 263), making the mass media one of the engines of western society.

With recent new technological development, mass media has encountered challenges posed by digital technologies and new social paradigms. From the mass media crisis of authority, mobile devices and the Internet are bringing us to a post-mass media era (Lemos, 2010): the broadcast decentralization creates a new mediation logic that expose multiple facets of our society once hidden by the filters of mass media agents.

Though the term *medium* conveys different meanings, here I am referring to it as an interface — a method or a piece of technology — that is placed between humans and the environment as a way to extend our body and senses. During the electric revolution, the meaning of *media* has changed. More than just processes, or machines, "the media" became social mediators. Media ceased to be just the interface between humans and the environment and began to embody the content within itself. Ergo, I use the term *mass media* in two senses: as a (1) technological device, and as (2) social and cultural agents. Mass media as technology begins with Gutenberg and his movable type printing press, allowing faster reproduction of printed information. This process was accelerated by other mechanical reproduction devices such as the gramophone and film. Ultimately, mass

media technology removed space and time barriers between the information sources and the audience with the introduction of electricity, with which Radio and TV broadcast information to a broader and dispersed audience around the globe. On the other hand, the term mass media can also be understood as cultural and social agents. In this case, I follow André Lemos, who defines mass media as a "centralized flow of information with an editorial control by big companies in the process of competition funded by advertising" (Lemos, 2010, p. 403). Other authors also use terms like "mass media agent" and simply "the media".

The focus of this chapter is neither to expose the entire evolution of media, nor the whole history of mass communication. My goal instead is to follow the genealogy of media technology in order to investigate not only its technical transformations, but also the cultural and social logic embedded in mass media society. I built this chapter on the metaphor of the cycle of seasons, from the spring of mechanical reproductions technologies, passing through the accelerated developments with electricity and broadcast capability in the summer, the eruption of mass media crisis in the fall, and finally the promises and uncertainties of new technologies during the winter. Understand the genealogy of mass media is fundamental to comprehend how new technological devices, particularly mobile devices, shift the logic of social mediation, and consequently change our interactions and relationships with space.

In the first section I explore media technology in its earlier stage: mechanical reproduction — the evolution of writing and reading through the advent of the typewriter, the invention of the gramophone, and the development of film, to store and reproduce audio, image and movement. It is the moment of standardization of information (Kittler, 1999) and popularization of media technology, which directly affected works of art and politics (Benjamin, 1936/2008b).

The second section exposes the interrelations between different media. With the introduction of electricity and the constant evolution in broadcast techniques, mass media gained momentum, and different theories were proposed to understand and explain mass media effects. Benjamin (1936/2008b), for instance, notes that the hegemonic power uses mass media to maintain

economic relations. To solve this issue, Enzensberger (1970/2003) proposed a socialist approach in which the proletarian could repurpose mass media in order to become free from the mediated oppression, but Baudrillard (1972/2003) quickly refutes his ideas arguing that every aspect of our lives is mediated, or, as McLuhan (1964/1994) claims, the content of every medium is another medium, which make us completely unaware that we are being mediated.

The electronic revolution is the topic of the third section. Information digitization unifies all media in a process of convergence, deeply affecting not only production methods but also the way people access and consume information. Manovich (2001) defines the main principles of digital media (numeric representation, modularity, automation, variability and transcoding) and argues that it has its own language and practices. Bolter and Grusin (2000) see the novelty but assert that this is just a new cycle of mediation, proposing that every medium reforms previous media in a process that they call *remediation*. Beyond technological advancements, digital media also breaks with the established mass media logic. Drawing on Deleuze and Guattari's (1980/1987) concept of *rhizome*, I hope to demonstrate how the Internet is the image of the networked society, shifting mediation from a 'one-to-many' direction to a 'many-to-many,' resulting, therefore, in an authority crisis on the mass media culture.

Finally, in the fourth section I conclude that recently developed digital technologies are opening the way to new forms of mediation. With the proliferation of computers, digital media could lead to information democratization and disruption of the classical sense of mass media. Scholars are calling this period 'post-mass media' (Lemos, 2010), in which the main feature is the decentralization of means of accessing, producing and distributing information.

Nevertheless, it is necessary to avoid technological determinism. Williams (1974/2003) points out that we often say that technology 'led to' cultural and psychological conditions. Technology is not the cause, but a "by-product of a social process that is otherwise determined" (Williams, 1974/2003, p. 293). Therefore, technology acquires effective status when it is used for purposes already contained in a given society. Thus, the social condition is the pivot point to explore the

rise and the crisis of mass media. Media technology evolved based not only on technical problem solving, but also on ideology and political momentum — "in no way is this a history of communications systems creating a new society or new social condition" (Williams, 1974/2003, p. 295), but it is clearly intentionally directed to its development.

1. Spring: *and so they are born.*

Technical developments during the nineteenth century gave birth to different media tools. New methods and machines were invented to assist us to produce information, separating the message from our body into three different channels — sound, image and movement, and text: the telegraph, the telephone, the gramophone, photography, and film share the common intentions to improve and extend human capabilities. Although some of them were not directly connected to communication in the beginning, they ended up providing a way to speed up information transmission. The telegraph, for example, is a by-product of railroad expansion, which needed a way to control the train traffic. Since this system could carry information in electric impulses at the speed of light, why do not use it to transmit more complex messages than simple signs of "stop" and "go"?

According to McLuhan (1964/1994), technology is a way we extend ourselves. That is, we develop machines and processes not only to improve and amplify a human's perception of the world but also to enhance methods of production and consumption. The car, for instance, extends our capability to move. The increasing speed of means of transportation eventually changes our perception of distance. Similarly, media technologies extend our senses in the same fashion: the spoken word gave us the capability to communicate our thoughts, while the written text preserves them in time; the telephone and the radio collapse time and space all together allowing instant voice communication. Thus, from the spoken word to phonograph; roads to airplanes;

money to clocks; print, telegraph, movies, radio and television: all of them extend our body and senses, ultimately speeding up society (McLuhan, 1964/1994).

Every time that a new technology is adopted in large scale, it causes a rupture in social paradigms. McLuhan (1964/1994) claims that a medium can change society's perceptions when it is introduced for the first time. He argues, for example, that remote natives had the same experience as the Western man himself when they were presented with electric light:

> We are as numb in our new electric world as the native involved in our literate and mechanical culture . . . [the] mental breakdown of varying degrees is the very common result of uprooting and inundation with the new information and endless new patterns of information. (McLuhan, 1964/1994, p. 16)

Nevertheless, technology alone is not able to disrupt society. Benjamin (1934/2008a) reminds us that we should not consider the object of analysis in isolation, but rather it has to be inserted in the living social condition context, which is determined by conditions of production (Benjamin, 1934/2008a, p. 80). Following this idea, Briggs and Burke (2005) note that the printing press revolution took a long time to begin in Russia and in the Orthodox Christian's domains in which the formal education was confined to the clergy and the Cyrillic alphabet was used: "the fact the printing arrived so late in Russia [an other countries] also suggests that print was not an independent agent" (p. 14). The absence of a secular and literate population, and the lack of certain favourable social and cultural conditions in Russia, were important obstacles to the advent of print culture in the region, which only began to develop in the sixteenth century, more than 150 years after the advent of printing press. Thus, external forces, such as politics, economy, literacy, and technology, including inventors and technicians that develop the technology in the first place, have to be taken into consideration.

Technology is, therefore, not the cause, but a "by-product of a social process that is otherwise determined" (Williams, 1974/2003, p. 293). Media technology evolved based not only on technical problem solving, but also on ideology and political momentum. They acquire effective status

when they are used for purposes already contained in a given society. However, in any case, technology translates experiences into new forms. It has being increasingly translated into the form of information, "moving toward the technological extension of conscious" (McLuhan, 1964/1994, p. 57), which means that we are able to express ourselves in other forms beyond our body.

1.1 Mechanical Reproduction

1.1.1 Sound (Gramophone)

"Hullo" was the first word ever recorded by the gramophone. The machine, invented by Thomas Edison in 1877, was capable of engraving sound vibrations (analog sound waves) onto a disc for later reproduction. The artificial (re)production of sounds, combined with its analysis, resulted in a new medium. In McLuhan's definition, the gramophone is the technological implementation of our central nervous system to capture speech as it was spoken. However, the gramophone's positive impact in communication was not felt without raising some reaction from scholars. The device captures the surrounding sound without making the distinction between voices and noise. It is a dumb machine that records the events as such, or, in Kittler's (1999) words, it is when "the real takes the place of the symbolic" (p. 24).

1.1.2 Text (Typewriter)

The typewriter did not create a completely new medium product; instead, it transformed the material basis of literature and increased productivity and accessibility. It became a portable printing press, and eventually the first means of interaction with a computer. Nevertheless, some scholars also registered negative impacts. For Heidegger, with the first mass-producible typewriter, created in 1874, the essence of writing was transferred to the machine and "the typewriter makes everyone look the same" (as cited in Kittler, 1999, p. 199). Hence, despite the criticism, the adoption of the typewriter followed industrial production logic: standardization, more efficiency and increased speed.

1.1.3 Image and Movement (Film)

The movie camera has the same principle as the photographic camera: capture the light and record it on a photographic film, though repeating this process a number of times per second. The illusion of movement, enacted when the film is reproduced using a projector, is the key factor — "since its inception, cinema has been the manipulation of the optic nerve" (Kittler, 1999, p. 115). In contrast to sound recording, which strives to perfectly record all the information it captures in sequence, the narrative attribute of film is reached when the producer is able to control image sequence. Furthermore, because film is produced and not just captured, Kittler agrees with Baudrillard's (1983) approach of simulations (which I will discuss later in this chapter) claiming that films tend to be "more real than reality and that their so-called reproduction are, in reality, productions" (Kittler, 1999, p. 145).

Besides its well-known importance to the entertainment industry, film is also used in politics, warfare, sciences, and academic studies. One of the most important relationships made by Kittler is the comparison of the film camera with automatic weapons: instead of killing, the camera fixes objects moving though space. In the same fashion, film technology has been used in war not only to discover enemy's location with attached cameras to airplanes, but as a tool for mass control and persuasion. The strategy is the total use of media instead of literacy to create simulations and deflect the attention from important events: "sound film and video cameras as mass entertainment liquidate the real event" (Kittler, 1999, p. 133).

1.2 Separation of the Message from our Body

Inasmuch as the inventions of gramophone and film extend our senses, the very meaning of media for McLuhan, ears and eyes became autonomous. Kittler (1999) argues that these inventions do not need humans to perform any actions. They record, store and reproduce data, changing "the state of reality more than lithography and photography" (p. 3). The mechanical automatization of the capturing and reproducing process led to standardization of information. In order for a machine to "read" the content of a message, it had to be translated into the

machine's language. For many it resulted in some kind of loss, either aesthetic or to the meaning itself. Calligraphy, for example, is an important aesthetic component of handwriting, but the new process speeds up text production, erasing a form of art and standardizing the appearance of the text. The uniformity brought by the machine resulted in more precision to the text, as well as restrictions to aesthetic representation.

The machines created in the nineteenth century had different purposes, hence data's attributes and channel functionalities vary greatly between media. They are incompatible — as Kittler (1999) states, "electrics does not equal electronics" (p. 2). Consequently, media technologies not only make the message independent, separating it from our body, but also create distinct methods to code and decode messages through a variety of channels. These machines are able to store it and reproduce at anytime: gramophones, for instance, mechanically record the audio from the environment into a cylinder or disc, whereas photography captures the light, and through a chemical process saves the image in a special support. Although these media can be used as complement to one another, they are poorly interoperable. That is, they have to develop an interdependent relationship, where they must be separately produced, but might be consumed together. Ergo, these machines marked the moment in which humankind separated its body from the message in three different channels: sound, image and movement, and text. To communicate ideas we have now to encode and decode thoughts devices — tools that supposedly would help us to remember things easily, transmit ideas faster, and speak to a broader audience. For Kittler, 1999), "machines take over functions of the central nervous system, and no longer, as in times past, merely those of muscles. And with this differentiation … a clear division occurs between matter and information, the real and the symbolic" (p. 16).

1.3 Political use of Works of Art

The early twentieth century saw fundamental political changes with the popularization of mechanical reproduction machines. Not only did information transmission become faster, but also some concepts, especially in the field of arts, went through deep transformations: the very

meaning of art was challenged, leading to a devaluation of artwork. Benjamin (1936/2008b) states "never before have artwork been technologically reproducible to such a degree and in such quantities as today" (p. 28). He notes that any reproduction, even the most perfect one, displaces a work of art and breaks traditional values — the work of art loses its authenticity. As Kittler (1999) exemplifies, the typewriter erases the unique marks of authenticity printed by the author on the paper. It standardizes the writing process and removes all the noise and unique nuances: "writing and soul fall apart" (Kittler, 1999, p. 14).

Benjamin (1936/2008b) claims that reproduction technologies disrupt the traditional value of the work of art. It devaluates an artwork's aura — "a strange tissue of space and time: the unique appearance of a distance, however near may it be" (p. 23). The uniqueness value of the *authentic* work of art based in rituals, first magical, then religious, and later on the cult of beauty, is declining. As soon as artistic production ceases to be driven by authenticity, the entire social function of art changes. Instead of being founded on rituals, Benjamin (1936/2008b) points to a different practice: politics.

One aspect under the political-driven art observed by Benjamin (1936/2008b) is the democratization of both the access to the object and to the means of production. The nature of literature was always predicated on a small number of writers to many readers. With technological reproduction, the number of potential consumers hugely increased, opening the opportunity to turn them into producers. As an expert in whichever specialized work, even the minor capacity, the reader gained access to authorship.

The technological reproducibility of artwork changes the relation of the masses to art. Instead of indifference or hesitation, they have a "progressive attitude … characterized by immediate, intimate fusion of pleasure — pleasure in seeing and experiencing — with the attitude of expert appraisal" (Benjamin, 1936/2008b, p. 36). One of the reasons is that in exhibitions of art (*e.g.*, in movie theatres, museums and art galleries) the experience is shared, creating an imminent concentration of reactions. However, art lovers reacted to this new meaning and experience of

art. Whereas they see a work of art as an object of devotion, the masses see it as means of entertainment.

On the other hand, governments and the hegemonic power began to use media technologies, aiming to control the masses. Benjamin observed these events during the period between wars, when authoritarian governments, especially Nazi-fascism, were in charge in some European countries. Fascists realized that they could use forms of art as a way to organize the newly proletariat masses while leaving intact the property relations that they strove to abolish. Benjamin anticipates one attribute of the emerging mass media: the aestheticization of politics by fascism and the politicization of arts by communism. Capitalism has the same goal and a similar strategy: it manipulates the masses using art merely as a way of entertaining in order to keep property relations unchanged.

2. Summer: *let's go out and play.*

In the beginning of the twentieth century, technology of communication was already evolving to electric form. The telegraph was the first information medium to use electricity, but only managed primitive forms of communication (Morse Code). Although its evolution to wireless transmission was very quick, the telegraph was a *proto* mass medium since it could only transmit information from one point to another, connecting only two people. It simply accelerates information dissemination without reaching a mass audience. In association with newspaper, however, the telegraph can be considered a component of mass media. The breakthrough occurred with broadcast technology, giving the capability for radio and TV to instantly transmit information to a wider and diffused audience.

During electric evolution, the meaning of the term *media* changed. Medium is the intermediary, the technology that is placed between humans and the objects as a way to extend our body and

senses. As asserted by McLuhan (1964/1994), "all media are active metaphors in their power to translate experience into new forms," and now they are "moving toward the technological extension of consciousness" (p. 57). Media cease to be just the link between humans and the object, and instead embody the content within itself — the "*content of any medium is always another medium*" (McLuhan, 1964/1994, p. 8, my emphasis). Therefore, the content of print is the written word; the content of writing is speech; the content of the speech is the process of thought. We are completely unaware that we are being mediated because "the effect of the medium is made strong and intense just because it is given another medium as 'content'" (McLuhan, 1964/1994, p. 18). Mass media agents will take advantage of these effects to maintain property relations and keep hegemonic power. Hence, mediation is not made by machines and their technical process alone: humans, with authority to select and filter information, are part of the mediation process, adding a social component to a technological interface.

2.1 Broadcasting

2.1.1 Radio

Radio is a direct evolution from the gramophone, the telegraph, and the telephone, that wirelessly transmits audio through electromagnetic waves. The radio was rapidly and widely adopted mostly because it is a very low cost medium, so the majority of people could afford to have one. By 1930, there were about 14 million radio receivers in the US alone (Briggs & Burke, 2005, p. 179).

With the power to broadcast information to as many people as possible and erase the distance between the speaker and the audience, the radio quickly got political attention — in 1940, most of European transmissions were in Nazis hands (Briggs & Burke, 2005, p. 174). They realized that they could speak directly to the people instantly and without any intermediary. It is an influential and persuasive social tool, especially because the owner could control the stream of information by selecting and filtering the news. As a result, the microphone became a powerful weapon for social control.

Even though the wireless transmission of information through the air is taken for granted, there are only a number of possible frequencies in which radio can transmit. No radio station is cost free; so, different funding models were adopted, reflecting the main function of the radio in each country. The British wanted to create a broadcast monopoly aiming at quality control. In the US, the radio followed the same ideals as the printing press, so people were free to establish a radio station without state intrusion, which was maintained mainly by advertising. As a result, hundreds of radio stations spread out in that country. Nevertheless, as Briggs and Burke (2005) assert, in general, the content was of the same kind in most countries: live or recorded music programs, soap opera, and news. Thus, independent of the country, government, agency, or period, "the *raison d'être* of all broadcasting was the offer of programmes to a large unseen audience" (Briggs & Burke, 2005, p. 181).

2.1.2 Television

Although the technology was available in 1930, the introduction of television was postponed until after the Second World War with the assumption that it was a luxury product, which only high-income families could afford. However, this theory was proven wrong as TV sales had huge success, especially among low-income families: the number of TVs in the UK reached the mark of one million by the end of 1951, and 20 million in 1952 in the US (Briggs & Burke, 2005, p. 189-191). This is the expansion of the mass audience that was being formed since the radio.

In the US, and in the majority of European countries, TV was clearly following the same path as the radio towards entertainment. The basic programs were very stereotypical, varying from games, interviews, soap operas, and theatre adaptations. As a result, many started to accuse broadcasting companies of continuing lowering standards and "making excessive profit from 'the use of facilities which is part of the public and not the private domain'" (Briggs & Burke, 2005, p. 193). Many critics pointed out that TV content was not only insufficient but in some occasions also distorted in order to manipulate the audience.

The first groups interested in TV broadcasting were the radio networks, since they already had the necessary infrastructure. Aware that the radio networks planned to preserve the content free of charge, the movie industry, after an unsuccessful attempt to push for a paid model for TV broadcast, heavily invested to guarantee TV concessions, including acquiring radio network companies. This movement created large media conglomerates (*e.g.*, NBC, ABC, CBS) forming the mass media agents, which in the near future become the guardian of the "truth of facts". The TV culture in US was growing so fast in the middle of the 1950s that TV companies quickly realized the potential to expand to other countries. Thus, the American TV, not only as a commercial and entertainment medium, but also as means of political and economical domination, spread out carrying cultural and social values — the TV became a hegemonic medium of communication.

2.2 Media as Mobilizing Power

While McLuhan was, in the greater extent, focused on the technological implications of mass media communication, Enzensberger's attention was on the use of broadcast tools. Following Benjamin (1936/2008b), Enzensberger (1970/2003) asserts that media has a great mobilizing power, but it is controlled by the *bourgeoisie*, which uses it as a way to keep control of the means of production. He observes that "monopoly capitalism develops the consciousness-shaping industry more quickly and more extensively than other sectors of production" (Enzensberger, 1970/2003, p. 261). Nonetheless, he believes that media's true essence is socialist: by reversing the circuits and redistributing media equipment, the proletarian class would be able to take their voice back.

The strategy developed by Enzensberger (1970/2003) is to liberate the media, and "return them to their social vocation of open communication and unlimited democratic exchange, their true socialist destiny" (p. 284). He proposes "network like communications models built on the principle of reversibility of circuits," which would make possible a "mass newspaper, written and distributed by its readers" or "a video network of politically active groups" (Enzensberger,

1970/2003, p. 267). He argues that the "contradiction between producers and consumers is not inherent in the electronic media; on the contrary. It has to be artificially reinforced by economic and administrative measures" (Enzensberger, 1970/2003, p. 266). Therefore, media equipment is not just means of consumption, but also means of production. Hence, he suggests that the masses should have the equipment available to produce, distribute and broadcast social movements. In other words, to create an alternative network broadcast in order to show what mass media agents hide.

For Enzensberger, capitalist configuration of media tends to reduce mass media to a mere "medium of distribution," so they must be reformed to become the true "medium of communication." However, his plan, written in the 1970s, could not do much more than a simple distribution of information due to technical limitations and the poor connectivity at that time. According to Baudrillard (1972/2003), the effects would be null without the means to induce social interaction. The simple fact of decentralizing the means of production would only generate more information without any effective communication.

The main point is that we need to restore the possibility of response. Baudrillard (1972/2003) argues that communication has to be understood as something more than a simple transmission-reception of a message. In the present form, mass media is anti-mediatory and intransitive. Hence, by denying the active audience, mass media makes the exchange impossible, becoming the root of the social and political controls. For Baudrillard, Enzensberger's ideas are hopeless. Direct equalitarian distribution of media production is not enough without breaking the monopoly of speech: "speech must be able to exchange, give, and repay itself as is occasionally the case with looks and smiles. It cannot simply be interrupted, congealed, stockpiled, and redistributed in some corner of the social process" (Baudrillard, 1972/2003, p. 281).

2.3 Simulations

According to McLuhan (1964/1994), technology increases society's speed — it moves from the centre to the periphery, expanding and extending its own logic. However, once it overheats, as

with the shift from mechanical to instant electric media, it tends to reverse, transforming the explosion into implosion, disrupting society's dynamic. It changes from centralization to decentralized patterns: instead of connecting centre and margin, it creates new centres.

In fact, mass media was so overheated in the 1970s that Baudrillard (1983) saw a rupture in the notion of truth and reality. He argues that mass media, especially the TV, was mediating every aspect of our life, which became just a simulation with no correlation with reality. According to him, reality has been replaced by systems of signs that encrypt and supplant the real: simulation precedes and determines the real — nothing more than simulations produced from matrices and models, which in turn can be countlessly reproduced. Thus, with the liquidation of all reference to the real, there is no measure against the ideal or negative instance. It is the hyperreal, "produced from a radiating synthesis of combinatory models in a hyperspace without atmosphere" (Baudrillard, 1983, p. 3).

Simulation is the active process of replacing the real, threatening "the difference between 'true' and 'false,' the 'real' and the 'imaginary'" (Baudrillard, 1983, p. 5). While representation is based on the principle of equivalence, simulation starts from the "utopia of this principle of equivalence, from the radical negation of the sign as value, from the sign as the reversion and death sentence of every reference" (Baudrillard, 1983, p. 11). Accordingly, representation tries to assimilate simulations by attesting false representation, whereas simulation absorbs representation itself as a simulacrum. Thus, in order to subvert and replace reality, Baudrillard (1983) sees simulations in four successive stages: (1) simulation reflects the reality, (2) masks and perverts reality, (3) masks the absence of reality, and finally (4) bears no relation to any reality whatsoever (p. 11).

Baudrillard (1983) believes that we are living under the fourth order of simulation, where "illusion is no longer possible, because the real is no longer possible" (p. 38). He asserts that reality is now controlled and orchestrated by the media, who holds the means to code and decode reality. For instance, mass media coverage of so-called historical events, such as strikes, protests,

and any type of crises, can be seen as hyperreal events. The version presented by the media is not connected to any real reference: it is a simulation of what *would* be happening, but not exactly what *is* happening. Baudrillard (1983) states that "all media and the official news services only exist to maintain the illusion of actuality of the reality stakes, of the objectivity of the facts" (p. 71), and, because of this, they become detached from their own goals and objectives, committed to the power effects and mass simulation.

Following this logic, our experiences become mediated through TV tubes and turned into a spectacle. It is impossible to distinguish the model of what people watch on TV or listen on the radio: *Is it real? Is it a representation of the real life? Is it all fake?* Moreover, Baudrillard (1983) asserts that it is also impossible to locate the medium itself, "since *you* are always already on the other side ... 'you no longer watch TV, TV watches you (live)'" (p. 53). It is precisely because of this fuzzy distinction between versions — between true and false, the original and the facsimile — that we are unable to perceive what is in fact real: whatever is mediated is a simulation.

We live in the age of information where every single experience is mediated by mass media, which shapes these symbols as agents of representation, not communication. It creates a new culture of signs, images, and codes, no longer based on referential value, but on exchange value. We have lost the ability to make sense of the distinction between the natural and the simulation, the real and the fake. We consume these signs of status and identity without realizing that they are themselves products of mass media simulations.

3. Autumn: *the sky is falling apart.*

Radio, and then television, prevails as main mass media channels on the period marked by the introduction of electricity and information broadcast. In fact, the technical capability to transmit content instantly over the air brought direct consequences to information distribution.

Nonetheless, technologies of the next generation were already being developed in the middle of the twentieth century, though it was not until the 1980s that the digital (or electronic) media established a process of media convergence that challenged not only the technical supremacy of hegemonic media (TV and radio), but also mass media agents' authority.

If the first mechanical reproduction machines split communication into three different channels (sound, image and movement, and text), digital media collapsed the channels again: computers converted every piece of information into discrete data with no channel distinction and broadcast in high speed through fiber optics, shifting once more the processes of production and consumption in society. Kittler (1999) claims that by using optical fiber network, "people will be hooked to an information channel that can be used for any medium — for the first time in history, or for its end" (p. 1). What was produced and delivered by different sets of channels using the inventions of the end of nineteenth century will be put all together in the same medium by digital media, erasing different constitutions among individual medium. For Kittler, it could erase the very concept of media, though it is less a *media convergence* than *media superposition* caused by the explosion of numerous different source options. It constitutes the multiplicity of the new media technologies, as stated by Briggs and Burke (2005).

3.1 Digitization

3.1.1 Computer

The early digital electronic machines were built to help with calculation in military operation and to encrypt/decrypt secret messages during WWII and the Cold War. Again, the motivation was not to improve communication or even to make profit, but to win the war. Despite the fact that computers are hardware, they cannot be seen as a one-purpose tool. As imagined by Alan Turing (1950/2003), computers are universal machines, able to unify computational processes, as the user can program them for any function.

In the beginning of the 1960s, computers ceased to be considered just calculating machines. Breakthroughs in physics allowed miniaturization of components, such as the transistor, integrated circuits and chips. It quickly made these machines smaller, cheaper, and more powerful, giving birth to the microcomputer, personal computer (PC). The use of PCs widely increased not only for commercial purposes, including the media (newspaper, radio, audio and video recording, TV, and all other forms of telecommunications), but also for domestic activities, transforming every aspect of production and consumption in society.

3.1.2 Internet

The Internet was conceptualized at the end of the 1960s as a computer network aiming to connect hi-tech universities in order to facilitate communication and share research information. It was built in such a way that the network "could survive the removal or destruction of any computer connected to it, indeed, even to the nuclear destruction of the entire communication infrastructure" (Briggs & Burke, 2005, p. 244). It was crucial that the network infrastructure was built in a way that any computer could join the system, something totally different from the already established communication systems, which from the perspective of the participant universities meant better access to information. Yet, at the end of 1980s, access to this network was very restricted, centralized in big servers controlled by the US universities.

In 1989, Tim Berners-Lee envisioned the *World Wide Web*, a way to remotely connect computers opening the possibility to democratize and release information exchange. He hoped to preserve the web as free and open, transforming a powerful communication system, which only the elite could use, into a mass media. Thereafter, with commercial exploitation, a network once dedicated to academic research became a public accessible network — the *Internet*.

3.2 Digital Media

Digital media has been shifting cultural production and changing other media. Manovich (2001) calls it "the meta-medium of the digital computer" (p. 6) and agrees with Bolter and Grusin, arguing that "the computerization of culture not only leads to the emergence of new cultural forms such as computer games and virtual worlds; it redefines existing ones such as photography and cinema" (p. 9). He proposes that the visual culture of a computer age "is cinematographic in its appearance, digital on the level of material, and computational ... in its logic" (Manovich, 2001, p. 180). Manovich (2001) assumes that the theory and history of cinema can serve as a foundation to look at new media, though it is not sufficient to explain the new paradigm: "New media may look like media, but this is only in the surface" (p. 48). As it is based on computers, he recommends that we should also look at Computer Science; so, "from media studies, we move to something that can be called 'software studies'" (Manovich, 2001, p. 48).

What is digital media then? The most common examples are the Internet, web sites, computer multimedia, computer games, CD-ROM and DVD. However, Manovich (2001) argues that this list is too narrow as it identifies the use of computers only to distribute and exhibit rather to produce. He believes that new media revolution comprises the shift to computer-mediated forms of production, distribution, and communication. Thus, looking for a better definition, Manovich (2001) proposes a set of principles that delineate the concept of new media in five major features:

Numerical Representation – New media objects are a collection of discrete data that not only can be mathematically described (quantitative) but are also subject to algorithmic manipulation (qualitative). Beyond numbers, though, a computer manipulates symbolic representations of data. As Simon and Newell (1960) notes, the use of numeric, rather than alphabetic symbols, is just a convention: "preoccupation with arithmetic is an accidental and not a essential property of [digital] computers" (p. 42).

Modularity – The content is separated from its structure and the objects are individually stored. It means that the components can be assembled in large-scale objects, while keeping their individual characteristics.

Automation – This principle, enabled by numeric representation and modularity, removes, at least in part, human intentionality from the creative progress. The objects can be programmable to automate operations by means of artificial intelligence.

Variability – Since the objects are programmable and can be connected in many forms, they are able to exist in infinitely distinct versions. The implication of this principle is paradigm shifting, from the pasteurized products of mass media to customized objects.

Transcoding – The translation of cultural objects to another coding system, one that follows conventions of computer data, allowing not only the communication between human and computers, but also a dialogue among machines — the information becomes trans-media.

New media also introduces new methods of operation through common techniques shared by different software, such as copy, cut, paste, search, composite, transform, and filter. These techniques are part of what Manovich (2001) calls media operations, in which he identifies five categories: *selecting*, *compositing*, *teleaction*, *sampling*, and *morphing*. Selection, for instance, is the new logic of producing things: instead of creating from scratch, it is possible now to assemble objects by selecting parts from a very extended library. Compositing came from cinema practices and refers to "the process of combining a number of moving image sequences, and possibly stills, into a single sequence with the help of special compositing software" (Manovich, 2001, p. 136). And teleaction is the means of operating objects from distance: there is a relationship between the objects and their signs; so, "we can move objects from one place to another by simply moving their representation" (Manovich, 2001, p. 167).

Furthermore, Manovich claims that the computer's interface is a new media cultural object. The graphic user interface (GUI) is not in any sense neutral or transparent. He defends that the

computer interface "acts as a code which carries cultural messages in a variety of media" (Manovich, 2001, p. 64). This code conveys its own logic system and ideology, which shapes how people conceive the computer itself. According to his theory, the language of cultural interfaces is created using elements of other familiar media, which make it directly dependent upon ideological, social, economical, and political hegemony. This linguistic creation follows a process of what Bolter and Grusin (2000) call *remediation*.

3.3 Remediations

Media are not transparent. On the contrary, they are translucent lenses through which we perceive the world. New media either add or replace lenses — forms of mediation — in society. Thus, the relationship and interdependence between media are central to understanding how media operates. For Bolter and Grusin (2000) new media is "that which appropriates the techniques, forms, and social significance of other media and attempts to rival or refashion them in the name of the real" (p. 65). Mediation is always what they call a process of *remediation*, involving not only technological features, but also social and economic aspects.

Remediation is a dialectical process working under a dual logic: *immediacy* and *hypermediacy*. *Immediacy* is the act of making the medium transparent, invisible, giving the viewer the sense of immersion. The methods of achieving immersion vary, but mainly they entail removing the awareness of the medium. Immediacy is not a novelty and has been pursued by earlier media, such as painting, photography, films, TV, and virtual reality. On the other hand, *hypermediacy* is a way of giving simultaneous access to the content, privileging the fragmentation and heterogeneity. The main goal is to make the viewer aware of the medium using different media at once. Hypermedia express multiplicity, producing a rich sensory environment at the same time that they make us aware of the media and remind us of our desire for immediacy in every manifestation. A computer's interface is an example of hypermediation, since it uses and mixes different elements of other media in many overlaid windows on the screen at the same time.

McLuhan (1964/1994) once said: “no medium has its meaning or existence alone, but only in constant interplay with other media” (p. 26). So, a*ll mediation is a remediation* attempting to improve and reinterpret the work of earlier media. Indeed, the combination of immediacy and hypermediacy is where Baudrillard (1972/2003) and McLuhan agree: “the effect of the medium is made strong and intense just because it is given another medium as ‘content’” (McLuhan, 1964/1994, p. 18), which makes us completely unaware that we are being mediated. If whatever is mediated is a simulation (Baudrillard, 1972/2003), then we are unable to perceive what is in fact real.

Therefore, media are always negotiating their space of representation among each other. In the process of remediation, new media take the properties of previous media as content, absorbing and redefining older media and their content all together. For Bolter and Grusin (2000), new media is first and foremost a remediation process (p. 45). They argue that the remediation process produced by digital media can be seen as a spectrum of four different forms. Media:

Represent an older medium using new techniques striving for immediacy. There are many examples of media representation, mainly in the form of mere digitization of older content such as text, painting, and photography. Nevertheless, in this case there is no content alteration, so “the viewer stands in the same relationship to the content as she would if she were confronting the original medium” (Bolter & Grusin, 2000, p. 45).

Emphasize different aspects, rather than erase, using new features to improve older media. The content is modified in such a way that the viewer can have an enhanced experience. Hyperlinking is a common feature used to connect and embed other sources of information, though older media are still recognizable. Hypertext can be just a different way to navigate in a digitalized book, for instance.

Refashion older media by mashing up the content. This case favours hypermediation, since the mixed media just call attention to the media itself. For example, the computer interface allows

different programs, representing different media, to run at the same time on the screen. Another example is a digital camera with special effects that mimic the aesthetics of older cameras.

Absorb another medium. According to Turing (1950/2003), computers are universal machines that can be programmed to perform any function. Thus, the computer completely incorporates many other media into digital form. As Manovich (2001) states, the new media's transcoding principles translate and hybridize content from one media to another media. It seems to be the case of the Internet that is in the process of completely absorbing and overcoming broadcast media such as TV and radio.

3.4 Rhizome

More than just a technological evolution, digital media are a paradigm shifting, which bring new possibilities for social communication. Making multiple copies of books and films or broadcasting information from a central station are not enough any more. With digital media, every user being connected on the Internet becomes not only a potential source of information, but also part of an interconnected data web. As a result, this new digital social network ecology breaks with the traditional mass media authority to control and determine reality. Thus, a new method is necessary to represent the multiplicity, interconnectivity and complexity of society.

The question is how to describe knowledge representation and interpretation in order to explain an increasingly complex world. Deleuze and Guattari (1980/1987) start looking at the tree-model, which has been used through the ages as a classification system in a variety of subjects. There are two types of tree-models: (1) the taproot and (2) the fascicular root. They are very similar well-organized structures in which information can be represented and traced. Their rigid formation allows ramifications from a single origin either using a pivotal root to fork into secondary branches (taproot), or directly extending the central source (fascicular root). However, the tree-model approach fails to represent multiplicity. Deleuze and Guattari (1980/1987) argue that these representations have never reached an understanding of multiplicity since "in order to arrive at two ... it must assume a strong principal unity" (p. 5). That is, the tree-model cannot represent a

fragmented world where the multiplicities have different facets and are constituted of many different sources, directions, forms and dimensions.

Using the same botanical metaphor, Deleuze and Guattari (1980/1987) introduce the ***Rhizome***, a post-structuralist perspective to describe what Deleuze calls an "image of thought" (p. 16). Rhizomes allow multiple and non-hierarchical entry and exit points in data representation and interpretation, assuming different patterns of "ramified surface extensions in all directions to concretion in to bulbs and tuber" (Deleuze & Guattari, 1980/1987, p. 7). It can also be observed in some animal organizations: rats, for example, form a rhizome when they swarm one on top of the other. In the same way, a rhizome could also be applied as a model for culture, characterized by "ceaselessly established connections between semiotic chains, organizations of power, and circumstances relative to the arts, sciences, and social struggles" (Deleuze & Guattari, 1980/1987, p. 7).

From this perspective, Deleuze and Guattari (1980/1987) conceptualize rhizomes according to the following principles:

Connection and Heterogeneity: Any point of a rhizome can be linked to any other — there is no hierarchy or genealogy to follow.

Multiplicity: There is no single source or unity that works as pivot point — just dimensions that dynamically reorient themselves whenever it expands its connections.

Asignifying Rupture: The connections, lines instead of a point, can follow any direction: they can be segmentary, organized and very defined, as well as disrupting and deterritorializing lines. They can abruptly stop, flourish in another place, or regenerate.

Cartography and Decalcomania: A rhizome is a map with multiple entryways as opposed to the tracing that always refers back to a unity. It is open and connectable in all its dimensions, adjusting itself to the context on each new connection made.

As a result, a rhizome is very different from trees and roots. A rhizome is a network, which connects any point to any other point without necessarily passing through a pivotal point. It is composed of dimensions rather than units and it does not have a predetermined beginning or end. The multidimensionality of a rhizomatic system also requires a change in nature, since "transversal communication between different lines scrambles the genealogical trees" (Deleuze & Guattari, 1980/1987, p. 11). Therefore, it puts forward a paradigm shift: instead of a structured and well-defined set of points around a centre focus with binary relations between them, the rhizome is a network concept with multiple forms of connections without any hierarchy.

Let's apply Deleuze and Guattari's formulation of the rhizome to mapping (as opposed to tracing) the increase in complexity media technologies. The concept requires that elements cannot be considered in isolation, but as part of much wider and interdependent ecosystem. The tree-model can be strongly attached to mass media. The reason is that since the introduction of mechanical reproduction technologies (Benjamin, 1936/2008b), it has been possible to replicate objects and data using a single model: books, films, tapes and pictures have their *master* edition that serves as model to make uncountable copies. That is, the master edition is the pivotal root that gives origin to secondary branches. Even after electric media and broadcasting technology, the tree structure prevailed, though in this case the flow of information resembles the fascicular tree: with the absence of a pivotal root, and being incapable of subdivision, the flow of information runs from *one central source* toward its audience in only one direction (Enzensberger, 1970/2003; Baudrillard, 1972/2003). Ergo, in both cases, the mass media is well-organized in a hierarchical structure.

Nevertheless, as a top-down system, tree-models cannot represent a multiplicity of mediation. Consequently, it is inadequate to use them to describe digital media. The concept of the network permeates the new paradigm: the Internet is a network of networks, which enable decentralization and deterritorialization. As a result, the source becomes multiplicities of sources; the information flow does not have predefined pattern behaviour, showing itself in many different ways and forms. Therefore, the multidimensionality of the network connection on the

Internet resembles a rhizome: no start, no end, no centre, and all dynamically organized. Moreover, new technologies, such as mobile media, which I will return in the next chapter, are pushing the Internet even further by adding permanent data entry during physical movement, augmenting the transient characteristic of the multiplicities.

Wikipedia can be considered an example of rhizomatic digital media in two different ways: information organization and crowd-sourced production. On one hand, since its articles can be hyperlinked to any other article, its structure cannot be traced, but only mapped. Wikipedia has no start and no end: it is a network of articles with no predetermined hierarchical structure that keeps changing as it grows. Similarly, the content production method adopted by Wikipedia is also crowd-sourced. It means that its content is freely produced by millions of people and anyone can add new information and collaborate in the discussions. There is no central unity or a top-down hierarchy: the information comes from everywhere. Again, it is impossible to determine a single genealogy. In Wikipedia, the tree ceased to represent the whole to become part of the network, and demonstrates that knowledge is in fact highly interconnected.

4. Winter: *the future is yet to come.*

McLuhan imagined that electricity would end by making things instantaneous. Indeed, electric technology collapses time and space altogether, though content from both TV and radio is still linear, time-based. Moreover, they are static and move in just one predefined direction, lacking feedback capabilities, argues Baudrillard. Thus, even though electricity made things faster, accelerating society, it never stops following the same industrial logic from the eighteenth century.

McLuhan (1964/1994) also predicted that once media overheats, it tends to reverse, transforming the explosion into implosion, disrupting society's dynamic. However, he was in fact predicting

the digital revolution. The extension of our central nervous system is the immensity of a computer network that allows us not only to *react*, as occurs when watching TV, but also to *interact* with the medium and other people through the media. The Internet is a multimedia medium, where the data is fragmented, like a mosaic, enabling the users to have a high level of participation as the audience travels through and across media. With the introductions of computers and data digitization, anyone can broadcast information, producing, therefore, a crisis in mass media culture.

Assuming that mass media is a "centralized flow of information with an editorial control by big companies in the process of competition funded by advertising" (Lemos, 2010, p. 403), we can see that a new model is emerging with the new technologies' methods — a new paradigm that has been called *post-mass media* by Lemos (2010). As a response to mass media crisis, it uses a decentralized network to enable anyone to produce and distribute information. It operates according to what Lemos (2010) calls three basic principles of cyberculture: (1) **decentralization of emissions**, (2) **bidirectional connection** and (3) **reconfigurations of institutions and cultural industry**.

Hence, the changes observed by Benjamin in the 1930s seem to be re-enacted in the early twenty-first century. The development of digital technologies made possible the reproduction of artwork to reach virtually unlimited quantities. In addition, as digital objects do not need to exist as a physical product, the costs of reproduction dropped to almost zero. Ultimately, making the distinction between copy and original becomes fuzzy, perhaps even unrecognizable for born-digital object: *the digital copy is the original per se*.

4.1 New Mediations

Baudrillard analyzed the causes and consequences of simulations in a society that was under the domain of mass media, mainly the TV. In the post-mass media era, where the decentralized network expands over the traditional channels, simulation gains new outlines. It is not possible to say that post-mass media overcome the whole idea of simulations, since mass media agents

still dominate and dictate what is reality and what is not. But at least two aspects have changed since Baudrillard (1983) came up with the idea of simulacrum, stretching and perhaps giving new sense to the concept: (1) shifting from traditional time-based centralized media to a digital multidimensional multimedia, leading to an (2) increasing participation level in the processes of communication and distribution of information, accelerated by social network platform and mobile media.

Following these two aspects, we can conclude that the Internet frees society from the dictatorship of a single source of information, which only shows one version of reality. It amplifies the channels of information allowing stories to pop up in many different flavours and points of view, making a much richer *reality* than the pasteurized news broadcasted by TV. Reality is now multiple, rhizomatic, based on many different references, though none of them seems to be the 'real truth' — rather, each one of them has their own reality (or simulation). Therefore, what we have now is a combination of different simulations of the real, stretching, but keeping Baudrillard's (1983)original formula.

4.2 Democratization

The advent of the Internet undoubtedly resurrects Enzensberger's (1970/2003) plan of a 'network-like' communications model. The information became crowd-sourced, written and distributed by its readers — or 'produsers', a term used by Bird (2011) to designate the dual role of users: producer and consumer. Moreover, digital media restores the possibility of audience response, claimed by Baudrillard (1972/2003) as crucial for social use of media. Users are not only able to choose from a broader number of information sources, but also free to produce, distribute, comment, and share their own content. It generates a huge critical mass that could confront mass media dictatorship. Nichols (1988/2003) claims that the liberation potential is clearly not in the simulation of the real or in the automated machines per se, but as seeing ourselves as part of a larger community that is able to self-organize and capable of survival.

Yet, the Internet, and its ecology, cannot be taken for granted. Nichols (1988/2003) reminds us that we have to ask ourselves "who owns the Internet?", "who designs and controls these systems?", and "for what purpose?" (p. 634). Although digital media remains dominated by the hegemonic power, "the very apperception of the cybernetic connection ... may also provide the adaptive concepts needed to decenter control and overturn hierarchy" (Nichols , 1988/2003, p. 640). This overturn is observed in hacker culture as well as in the self-organized and crowd-sourced open-source community. They even transgress the limits of the law in order to rebalance the power and do what Benjamin (1936/2008b) has already stated: not only to produce and reproduce the existing relations of production but also to reproduce those very relations in a new and liberating ways.

5. Summary

In the beginning of the twentieth century, Western society started a process of information digitization. This process, once established, grew rapidly, accelerating society until the point that it created its own contradictions and began to collapse. It began with the advent of mechanical reproduction machines, which not only were capable of replicating objects but also detached the message from our body into different channels. These technologies brought the possibility to spread art and pieces of information in a way that was not possible before. As a result, the artwork lost authenticity, giving to the masses the sense of urgency to reappropriate works of art. Moreover, it enabled not only other forms of art, but also introduced new methods of social mediation.

In a way, a technological breakthrough in communications is also related to transport issues. Boorstin once said: "while communication was once an inferior substitute for transportation it is now often the preferred alternative" (as cited in Briggs & Burke, 2005, p. 216). In fact, after the introduction of electricity, and especially the capability to broadcast information wirelessly,

information is being delivered anywhere that can capture the signals. Not only did communication become instantaneous but also information could reach many more people than ever before. As a result, time and space are collapsed and dissociated, creating involvement in depth.

More than just broadcasting information everywhere, mass media is transforming Western society over the centuries. However, it was not in any sense a transformation only caused by the technology affordances. Media technology was born to meet different social, economic and political needs, such as the desire to communicate information in different forms, the demand to improve distance communication, and the urgency to speak to as many people as possible. Therefore, it is not without a reason that mass media agents allow communication only in one direction: from one to many.

Benjamin (1934/2008a) reminds us that we should not consider technology in isolation. It has to be inserted into the living social condition context. Moreover, he states that social condition is determined by conditions of production (p. 80). Therefore, external forces, including the inventor and technicians that develop the technology in the first place, have to be taken into consideration. Accordingly, mass media has always been used as a form of social control: radio and TV are the tools with which governments and economic powers mediate events. As put by Baudrillard (1983), every aspect of our life is mediated — nothing is more real than the simulations produced by the media. Thus, mass media agents became the censor, the society's filter, choosing what people can or cannot see, listen to or read.

Electronic media emerged at the end of the twentieth century bringing new forms of information production and consumption. More than just technological improvement, digital media is in the process of absorbing and overcoming previous media: transcoding gives computers the ability to translate content between different media and, ultimately, collapse them into a single channel. Also, its network characteristic is challenging classical mass media logic: instead of a static and

hierarchical organized flow of information, digital media is dynamic, composed of decentralized connections between many sources.

This paradigm shift is leading to a post-mass media era, where users have more power to oppose the hegemonic forces and confront mass media authority. As digital technologies branch out to different methods of mediation, including spatial mediation, mobile media present themselves as one of the faces of the new post-mass media era. In the next chapter, I will demonstrate how mobile devices are changing the way we interact with space and place: pushing the Internet even further by adding permanent data entry during physical movement. Mobile media augment the transient characteristic of the multiplicities, allowing people to participate in the production of space.

However, this is a period of uncertainty, when the technologies of the future are in development. Technology by itself does not change society; so, we cannot deceive ourselves: the post-mass media tools are designed by the constituted power and have their agendas. As Nichols (1988/2003) put it, we have always to ask: "Who owns the Internet?", "Who designs and controls these systems?", and "For what purpose?" (p. 634).

Chapter 3: Mobile Media and New Forms of Spatialization

Following the digital technology revolution, and as a consequence of the mass media crisis at the end of twentieth-century, new methods of social mediation have been emerging.[1] With the establishment of digital networks (*i.e.*, the Internet) as the main channel of information (where all other media interconnect), the logic of a centralized flow of information, crucial for mass media, is slowly losing its strength in favour of a new paradigm in social communication: post-mass media. According to Lemos (2010), post-mass media use a decentralized network to enable anyone to produce and distribute information. It operates according to what Lemos (2010) calls three basic principles of cyberculture: (1) **decentralization of emissions**, (2) b**idirectional connection** and (3) r**econfigurations of institutions and cultural industry**.

The intensive use of wireless communication systems in conjunction with digital networks enables massive participation in the production and distribution of information, resulting in a decentralization of social mediation processes. It is in this context that mobile media emerge as a potential way to increase the capillarity of participation: the possibility to interact with space and other people whenever you want, wherever you are. Though mobile media are not a novelty, technological improvements in the last decade gave birth to a variety of new mobile devices, such as cellphones, digital music players, portable video games, and more recently, smartphones and tablets.

Moreover, mobile media allow computing and production of information in movement. Since movement occurs in space, this new method of interaction with the environment changes the way we perceive and experience places. Indeed, mobile media add a new layer of information to space: a digital layer that crisscrosses and overlaps the physical landscape, introducing new ways

[1] See chapter 2 on media history and theory.

to not only interact with the city, but also reappropriate and virtually augment urban space. Consequently, smartphones can be seen as an interface between the user and the physical space.

Roughly speaking, *interface* means something that is between two parts or systems, and supports communication or interaction between them. As Silva and Frith (2012) put it, interface "is something that makes a connection between two parties, but it also becomes part of the system, influencing how they interact with each other" (p. 2). It is like a membrane that filters and translates information between two agents. In 1960, the concept became widespread in computational fields as a way to facilitate operations among different components.

However, it was only with the development of Graphic User Interfaces (GUIs) in the 1980s that the term became part of everyday usage. In a simple way, GUI is the translation of computer's binary codes into visual language, making it more suitable for non-specialized users, and "transforming the computer screen into a space to be navigated and inhabited" (Silva & Frith, 2012). A GUI is not in any sense neutral or transparent, acting "as a code which carries cultural messages in a variety of media" (Manovich, 2001, p. 64). This code conveys its own logic system and ideology, which shapes how people conceive of not only the computer itself, but also the digital space. As a result, interfaces not only translate or mediate, but also shape interactions and create meaning.

Whereas desktop computers have very specific interfaces, such as a screen, mouse, or keyboard, pervasive interfaces can be mobile and sometimes invisible (mobile devices, RFID tags, Wi-Fi spots, and various other sensors). These interfaces enable people to track and to be tracked, affecting "our sense of privacy, and influence surveillance, control, and power mechanism" (Silva & Frith, 2012, p. 3). Mobile media create what Silva and Frith (2012) call a *social interface to public spaces*, which is a way to filter, control, and manage social interactions with other people and the space. Furthermore, mobile media operate according to the principles of cyberculture, that is, decentralized broadcast, multidirectional connection and reconfiguration of institutions and cultural industry. As mobile devices become increasingly present in our society, they should be

understood as a social and cultural interface that mediates not only information and communication, but also our everyday experience and interaction with the space around us. In this context, smartphone is an important technology to interface and mediate our experience of space due to its high penetration in society, and its technological capability that enables people to not only access, but also track, produce, and communicate information from non-fixed places. As a result, they become not only means *to* consume information, but also tools *for* communication with greater potential to decentralize mediation and civic participation.

In order to explore the potentials of mobile media in interfacing our interactions with space, this chapter is divided in three section: (1) define what comprises mobile media and how they have been used to interface public spaces, (2) describe the current state of mobile media, especially smartphones, and (3) analyze the relationships between mobile media and the urban space. In the first two sections I follow Huhtamo's "Pockets of Plenty: An Archaeology of Mobile Media" (2011) to establish the distinction between portable and mobile technologies. If in the past books and personal music players allowed some interference on the immediate user's surrounding space, today smartphones expanded these interactions and enable active participation in the mediation of space.

Finally, the third section investigates how mobile devices interface and embody digital actions at specific locations. I use Lemos' (2008) classification of locative media projects to explore the current methods people have employed to use mobile media to interact with space: (1) **mapping and geo-localization**, (2) **urban electronic annotation**s, (3) **location-based mobile games**, and (4) **smart mobs**. As a result of these activities, new layers of meaning are added to the space, producing resignification of places by a specific group of people, as well as public reappropriations of space, ultimately changing cultural practices and shifting the balance in social power relations.

1. What are Mobile Media?

The idea of moving around with a piece of technology that mediates and facilitates (tele)communication is cultural rather than universal. Huhtamo (2011) notes that it was only after the French Revolution that telecommunication became clearly understood. The desire for more speed in information exchange was demonstrated by the urgency of horse-mounted messengers, though they only transported a message between two fixed locations, and had no access to communication devices *en route*. It took two centuries to fully build the infrastructure (from installing the first telegraph poles,[2] to making technical developments in electronics, and finally setting up a wireless network communication system) to accomplish the desire of mobile media.[3]

Nonetheless, mobile technology is not a novelty. We have been using cell phones and playing portable video games since the 1990s; we used to listen music on a Walkman in the 1980s; take pictures with a portable cameras and track time with pocket watches since the sixteenth century; and navigate using a portable compass since the fourteenth century. Nevertheless, it was not until the early years of the twenty-first century that a breakthrough happened: all of those gadgets became digital and embedded in one simple device.

It is rare to find any mentions of *mobile*, *portable*, or *wearable* devices in the study of media's history. Even Marshall McLuhan, with his prophetic discourse about the future of media, had little to say about mobile media. Most of time, the genealogy of media is based on an idea of media as a spatially fixed system, in which "signals penetrate the wall, and broadcasting blankets huge virtual territories, but the material nodes of the network, the equipment used as transmitters and receivers, and found in fixed locations" (Huhtamo, 2011, p, 23). The use of any media equipment requires a certain condition: usually the user has to stop in a fixed location, find a comfortable

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[2] See Briggs, A., & Burke, P. (2005). Social History of the Media: From Gutenberg to the Internet (2nd ed.). Cambridge, UK; Malden, USA: Polity

[3] See chapter 2 on media history and theory.

position, switch the device on, and finally start to communicate. Mobile media, on the other hand, is suitable to be used in motion: always ready for use whenever required, with no need to stop at a specific location or to find a comfortable position. Indeed, modern mobile devices never cease to communicate, thus they never have to be turned off.

Whereas typewriters and laptops can be considered mobile media, Huhtamo (2011) put these pieces of equipment in the category of *portables* — light enough to carrying around, but often needing to be set up on a surface to be used. I am rather interested in mobile media that can be use in motion trough the space, which Huhtamo (2011) calls *wearables*. In a more rigorous sense, a wearable is an object that is attached to the user's body and can be used in movement. Even though mobile phones and music players are kept in the pocket, they are classified as wearable since they become part of the owner's clothes, enabling their usage in motion. Considering the pervasive attribute of these devices, they ultimately can reach the level of "hands-free interface," such as wristwatches, and augmented reality glasses. This close relationship with the machine produces hybrid individuals, which could be understood as the threshold between humans and cyborgs.

In order to understand digital mobile media we have to find the roots of their current use and identify possible predecessors or pre-forms of mobile devices. While mobile media did not play a widespread role in media history, its concept surely appeared before its materiality, even existing as a shadow cast by other applications "traveling with the users in guises, fulfilling functions, but rarely perceived for what they were" (Huhtamo, 2011, p. 24). Understanding the social-cultural conditions, therefore, can give us clues about the current condition of mobile media, including its obsessions, excesses, and its reappropriations by each new generation. Thus, in order to describe the desires, uses, and consequences of previous mobile technology in relation to their experience of the space, I will briefly examine three different types of mobile devices: reading devices (book and newspaper), photographic equipment (camera), and personal music devices (Walkman and iPod).

1.1 Reading Devices

The intense industrialization of Western Europe included the spread of railways to facilitate transportation of goods and people, quickly supplanting the horse-drawn coach as the dominant form of transportation. On the train, people were expected to sit for long periods of time and share the same space with the company of strangers. In this case, individuals were looking for a tactic to avoid social contact or to practice some control of their experience in a shared space. They soon discover a very powerful tool: the pocket book. The book was not always a portable technology — early printed books were larger and somewhat difficult to handle. The book format that we know today was established in the nineteenth-century, when the pocket book was introduced. As we can see, it was not a direct result of improvements in printing technologies, rather it is a consequence of social forces: the shape of the book changed in part because of the increased mobility of the *bourgeoisie*.

The narrative of the book assists people in producing their own space, where they can feel more comfortable, developing what Simmel (1903) called the *blasé* attitude. In a way, it is as if a person escapes from the real space by reading a book. However, even though immersion can be achieved in these circumstances, the experience of the narrative is shaped by the place where the person is, and the experience of the place is shaped by the narrative. That is, the "reader does not completely withdraw from the space of the train into the narrative. She is both in the train compartment and in the space of the novel"(Silva & Frith, 2012, p. 39). This happens because the book can fully occupy only one sense: the visual, which is the easier to control. In order to filter the visual space, we can either close our eyes or focus on one specific object. Ergo, the book (and newspaper) is a mobile medium that helps us to filter our surroundings and produce our own individualized space, though we still perceive the physical space with other senses, like haptic, olfactory, and auditory (Lynch, 1964).

1.2 Photographic Equipment

Another manifestation of the desire for mobile media was the amateur usage of photographic equipment in the end of nineteenth century. A person could easily carry a light camera box, roaming in public spaces looking for subjects for their pictures. In fact, this action produced a transgression in the existing social rules, especially related to privacy in public spaces, and moral issues. Huhtamo (2011) argues that amateur photographers' activities, "were felt to develop into a kind of distributed panopticon — anybody could become a target at any moment"(p. 28). Similarly, the use of cellphones in pubic spaces by young Japanese, especially teenage girls during 1990s, also raised questions about social behaviour, traditional values, and good manners (Itō, Okabe, & Matsuda, 2006). In both cases, demands were made to regulate the use of cameras and cell phones in public spaces.

1.3 Personal Music Device

In 1979, Sony released the Walkman, equipment that produces a similar effect to the book. When people put on their headphones and walk on the streets they create a sound bubble, enabling them to control the levels of social interactions as they move through the public space — almost like creating a soundtrack of their lives. According to Briggs and Burke (2005), the Walkman not only changed the way people listen to record music, but also had great impact on the direction of mobile technology's developments, especially the cell phone.

The Walkman, and more recently, the iPod, adds a new auditory layer to the space; yet, the space produced is highly individualized and not experienced by all users in the same way. In fact, Silva and Frith (2012) claim that the Walkman acted as an "aestheticizing force" (p. 42): rather than simply ignoring what is around, users changed the way they perceived the space. That is, the Walkman does not remove people from space; instead it reshapes the experience, customizing, and filtering the sound nature of the environment. This is achieved by reappropriation of space as part of, or constitutive of, users' desire: either overlaying a personalized soundtrack, or just

cancelling the outside noise, make the act of walking on the streets with a Walkman a powerful tool to control the levels of social interactions and interfere in the production of public spaces.

2. Digital Mobile Media

Digital mobile media emerged from the miniaturization of electronic components that made the bulky desktop computer obsolete as we replaced it with the laptop computer. However, laptops fall under the portable category — easy to carry around, but not really suitable for mobile usage. Mobile media, as we picture them today, pre-suppose a *desire* for mobility, thus they only unfold with the convergence of communication technology, particularly the telephone, and computational apparatus: the cellphone. While fixed phones connect specific locations, mobile phones connect people who move through space.

Digital mobile media embed different tools, particularly tracking and capture systems, and the capability to connect to other devices, building up a convergence across media. These devices not only enable people to consume and produce information in any place, erasing part of the social mediation imposed by mass media agents, but also give us the ability to experience the space in new ways. So, the way we conceive of space and our interaction with it has everything to do with the ways that the media are utilized. According to Farman (2011), today's mobile technology "heralds an era of what many have termed pervasive computing" (p. 5).

Pervasive computing is based upon the concept of ubiquity of digital technology in everyday life, connecting and integrating every aspect of our society (Farman, 2011; Galloway, 2008). Rather than using bulky desktop computers as concrete objects in the human dimension, the concept centres on "context-aware computing." That is, the machine is embedded in the environment, which could react to our needs and actions by supplying computational power everywhere. Hence, mobile media are very connected to different forms of mobility, especially in the urban

space: from walking to skateboarding, private cars and taxis, subway trains and airplanes (Tiessen, 2011).[4]

As a result, physical spaces become *smart* by having sensing and responsive capabilities. Farman (2011) notes that this concept strives to hide its own interface, producing a silent and transparent mediation, which Bolter and Grusin (2000) call immediacy. Instead of depending on pre-designed visual clues, such as buttons, windows, scroll bars and icons, very common to digital interfaces, users will "naturally" interact with real objects in the physical space, which will ultimately blend the virtual and the material worlds. According to Farman (2011), "objects affected in one environment affect the other," which will eventually lead to a moment when "it is no longer useful to think of them as distinct categories" (p. 6).

Mobile media add other layers to our perception of connectivity, since they allow us to make new connections with other people as well as with the space around us. Silva (2004/2011) states that by appropriating new media, "creative uses of the technology emerge, leading to a shift not only in our social relationships, but also in our perception of space" (p. 72). The emergence of mobile media as a nomadic technology transforms the cityscape into a responsive surface, where each location can be re-signified through digital interaction. Moreover, as Farman (2011) argues, mobile devices have been used not only for two-way communication or for media consumption, but also to "document the world [and] interact with the surrounding environments in ways that far exceed the initial design and purposes" (p. 8).

Mobile media are not the only manifestation of pervasive computing, though this model is useful to grasp the impact of mobile devices in urban space. If we still do not have computers built into every object and environment, we are at least carrying computational power in our pockets wherever we go. We can easily affirm that smartphones have become ubiquitous in society and instead of disappearing into the fabric of our lived experience, they hypermediate our perception of physical spaces. Thus, smartphones become an important communication device not only to

[4] See more about mobility in chapter 1 on space and place

access and consume information, but also as social mediation tools, where many-to-many communication is possible in real time.

2.1 History

The 1990s saw the first steps toward mobile computing evolution with Personal Digital Assistants (PDAs): in 1993 Apple released the Newton MessagePad; following by Palm computing in 1996 with its Palm Pilot. These devices had no wireless communication until the end of 1990s, when DoCoMo (Japanese Telecom Company) released the first mobile device that had both computing power and the capability to make wireless phones calls. As smartphones gained traction during mid-2000s, especially among business executives, other companies entered the market: Microsoft launched its Windows Mobile, and the Canadian RIM released the Blackberry. Nonetheless, these early devices were an evolution of the big and dumb mobile phones from the 1980s. With small computing capability, their usage was primarily for office tasks, such as schedule functions, contacts organizer, access to emails, text documents, spreadsheets and a light version of a web browser. Because of the small screen and the full keyboard, these first smartphones were called Pocket-PCs, though surely never intended to replace PCs, since the focus of usage was too narrow at that moment.

Mass adoption only began in 2007 with Apple's *iPhone* and others brands using Google's Android operating system, introducing a number of functionalities, including Global Positioning System (GPS), digital compass, accelerometer, light sensor, camera, more Wi-Fi connection alternatives, audio and video capturing tools, and a tangible user interface. Because smartphones embed so many tools, they can be used for any purpose and by a wider audience. Most importantly, new economic and cultural ecosystems emerged around these mobile devices, enabling developers use dedicated Software Development Tools (SDK) — once only available to the manufacturer and telecom companies — to produce applications that can take advantage of a smartphone's built-in features. These functionalities expanded the engaging potential of digital media beyond desktop computers, allowing users to interact with not only other people, but also with the

physical and virtual space: the smartphone added mobility to the digital world. Now, people are able to access the Internet, read books, browse the web, visit a variety of social networks, discover the urban space, play games, shop, watch movies, track data, and keep in contact with their friends and relatives, just to mention some possibilities.

2.2 Affordances

As stated above, smartphones carry new features, which we can split in three categories: (1) **Tracking features** — light sensor, accelerometer, gyroscope, GPS —trace the user's environment, location, direction, orientation, and speed, and translate it into digital data; (2) **Recording features** — microphone and camera — capture what users see, say, and hear; and (3) **Communication features** — Wi-Fi, Bluetooth, and 3G and LTE — allow information exchange with other digital devices and the Internet. Though tracking and recording features have different purposes, they can fit in each other's categories, for example, video cameras can track the user's sight, and GPS can record user's path over time.

Combined, these tools open many opportunities for digital interactions. For instance, one can use the gyroscope and the GPS to see position and direction in a map (*e.g.*, Google Maps[5]); the accelerometer can be used to track the pace and speed of a runner (*e.g.*, Runkeeper[6]); the camera can be used with the GPS to save a picture's location (*e.g.*, Camera+[7]); the GPS can be used with the video camera to produce a sense of immersion in augmented reality experiences, showing the camera sight on the screen and overlaying information based on user's location (*e.g.*, Acrossair[8]); or even using the microphone to 'ask questions' of your mobile device and get contextual answers (*e.g.*, Siri[9] — natural language user interface built into Apple's mobile devices).

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[5] Google Maps: https://maps.google.com

[6] Runkeeper: http://runkeeper.com

[7] Camera+: https://campl.us

[8] Acrossair: http://www.acrossair.com

[9] Siri: http://www.apple.com/ca/ios/siri/

2.3 Locative Media

Locative media is defined as a set of technologies that enable wireless info-communication processing based on networks where the content is tied to a specific place. It expresses the exact location, or the surroundings, of the moment and place of action. The term was proposed in 2003 by Karlis Kalnins as an attempt to differentiate the corporate use of locational services and artistic purposes. As Berry (2008) notes, locative media art goes back to the Situationist movement of the 1960s, "where artists intervened in the urban landscape to provide alternate visions and readings of urban spaces" (p. 103). Projects involving locative media have diverse adjectives, including tangible, mobile, ubiquitous, pervasive, invisible, embedded, physical, environmental, and ambient. Instead of working exclusively in physical space, locative media use mobile devices to create contemporary digital commentaries on urban spaces, resulting in a sort of hybrid space. Thus, locative media enable new forms of writing and reading urban space, producing new representations and social experiences of places.

Since locative media uses mobile technology, McCullough (2006) inquires, "what happens when media become embodied in access, spatial in operations, and place based in content? In particular, what happens when information technology moves out beyond the desktop into the sites and situations of everyday urban life?" (p. 26). Lemos (2010) replies that we must understand mobility and urban space within a new media framework: production and consumption of information on the go while moving physically in the space and at the same time jumping through virtual-information space. Mobile media have the capability to deliver data based on the user's location, hence specific sites allow the user to reach particular information, binding the virtual world with the material. Thereby, it enables locationally aware narratives: stories that unfold in real space (Karapanos, Barreto, Nisi, & Niforatos, 2012).

3. Spatial Embodiment

While technologies from the 1990s were criticized for creating sociability in virtual space, therefore producing an escape from reality, mobile media and pervasive technology made us more aware not only of the physical space in which we live, but also expanded the ways people perceive real places. As Silva (2004/2011) argues, "mobile technologies bring these multi-user and playful experiences to physical spaces, encouraging users to go out on the streets, and bringing new meaning to familiar spaces" (p. 78). We experience the world not only through our sensory apparatus (sight, hearing, taste, smell, touch), but also by means of social-cultural products (language, art, power, knowledge). As Farman (2011) notes, "locating one's self simultaneously in physical space and digital space has become an everyday action for many people" (p. 17). Mobile media are, therefore, the lens for all of our interactions in the hybrid digital-physical space, such as mapping our location on a mobile app, interacting with other people via social media, experiencing site-based art and performances, participating in a large community through locative games, and interacting with temporal and spatial narratives.

Digital spaces created by mobile interfaces affect the way people experience and represent physical space. Indeed, mobile media offer very real experiences by binding virtual and real objects, which challenges our perception of what is the *real* space. For Farman (2011), part of this challenge has to do with the dichotomy between real and virtual: we usually conceptualize virtual as opposed to physical. During the 1990s, virtual reality (VR) became "a cultural metaphor for the ideal of perfect mediation" (Bolter & Grusin, 2000, p. 161). VR technology strives to erase mediation to create an authentic experience of the space — not the real space, but a highly controlled hypermediated cyberspace. The same metaphor was used to describe online cyberspaces, since we used to access the Internet mostly from fixed places; virtual was understood as a simulation of another physical place (museums, chat rooms, homes).

However, for Farman (2011) this approach fails when we are dealing with mobile media because it does not address "the sensory-inscribed experience of virtuality as multiplicity"(p. 37), ignoring

its materiality. Virtuality does not erase reality; instead it is an experience of multiplicity and a "constant interplay that bonds the virtual and the actual together" (Farman , 2011, p. 38). This notion of multiplicity becomes more perceptible in the shift from immobilized personal (desktop) computer to pervasive (mobile) computing, allowing digital space to interact with the material space in a novel way affecting the production of space. Therefore, mobile media do not aim to produce virtual worlds that replace the real world, or to create, as Lemos (2008) calls it, a deterritorialization process. They rather emphasize control, territorialization, and the production of content that is bound to objects and places.

For Lemos (2008) we must avoid "a romantic and dichotomous view of these new cyberculture processes and try to understand new and old meanings of concepts such as territory, place, mobility, and community" (p. 93). For instance, locative media have the capability to deliver location-based data binding the virtual world with the materiality of a specific site. Augmented Reality (AR) is another way to intersect both worlds: using information visualization superimposed on physical space, we can take advantage of our abilities for pattern and relationship recognition, eventually leading to a transformation of spaces into meaningful places. That is, connecting meaningful information to the space produces *implacement* (the counterpart of displacement), or a way to situate ourselves in particular places. According to Farman (2011), "implacement gives us a sense of embodied integrity in a particular locale and also answers the question, 'which way am I going,' and 'what am I doing here?'" (p. 42).

It is important to note that when we use technology to give meaning to a place, the specificity of the media and the materiality of the technology are very important. The medium, the location, and the context together determine how people will grasp the information and the space. Farman (2011) observes that "our experience of place through mobile technologies is at once a phenomenological engagement with a particular medium and a mode of reading the significance of that mode of engagement" (p. 45). Thus, some content, especially embodied content, is not transferable to other media or situations. For instance, retrieving information from Wikipedia using a desktop computer is very different from accessing the same information using a mobile

device from a specific place. Using the location as a parameter, mobile media can deliver specific details about the surrounding space. Since users are situated in space, they can bind together spatial information from their sensorial apparatus (*e.g.*, sight, hearing, smell) and contextual data from mobile media to make sense of the space and take action.

We could affirm now that the real landscape becomes, therefore, an interface to access information. However, *locale*, which is the practiced and contextualized location (Lippard, 1998), has always served as interface. For instance, we can perceive information through graffiti and billboards in the urban space. The novelty is that whereas locale information is very tight and restricted to the materiality of the place, making it at the same time limited and valuable, mobile media are able to overlay physical aspects with digital information, which Lemos (2010) calls an *information territory*, showing what was hidden, locked, or unknown about the place, as well as opening opportunities for new interpretation and practices of the space.

According to Lemos (2008), the everyday practice of mobile mediation in this hybrid space, or information territory, falls under four different categories:

Mapping and Geo-Localization — tracking and customization of spaces by the use of multimedia content and share functions in order to build bottom-up maps, reinforce communities, and produce new meaningful experiences;

Urban Electronic Annotations — attaching and sharing multimedia content (photos, text, video, sound, and other discrete data) to specific locations in order to *rewrite* and reappropriate the urban space;

Location-Based Mobile Games — combining physical and digital elements to repurpose the urban space using game's ludic affordances;

Smart Mobs — mobilizations coordinated through mobile devices to perform political and/or aesthetic actions and temporarily refashion places and territories.

3.1 Mapping and Representation of Space

Notwithstanding the fact that digital maps are a very new technology, only made available to the public in the last 15 years (*e.g.*, vehicle GPS), they have become a very popular (also very intrusive) mobile media experiences. We began to heavily (and blindly) depend on them all the time, transferring to the machine the effort required to locate ourselves in and navigate through space. Not surprisingly, Google Maps is the most frequently used mobile app — 54% of global smartphone users in the world (GlobalWebIndex, 2013).

Early digital mobile technology had already allowed people to use digital information to create new maps. The artist Jeremy Wood, for example, used a GPS device to trace his movements through space in a series of projects called *GPS Drawing* (2000). Amsterdam Real Time installation (2002) took this idea further by tracking participants in real time, and, as described by Silva and Frith (2012), "transmitted live representation of their paths through downtown to the exhibition Maps of Amsterdam" (p. 91). Though these projects depended entirely on a standalone GPS device, which means limited interaction with the space and other people, they successfully reveal the contrasts between the traditional maps and the live produced maps of the urban space created by the mobility of people.

Digital maps (*e.g.*, Google Maps, Apple Maps[10], Bing Maps[11], and OpenStreetMap[12]) depend on culturally situated maps, ranging from a subject point of view (street view) to disembodied voyeur (aerial view), implying a very distinct perception of space and different ideological status of the observer. Maps are so commonsensical that they are almost transparent to critiques — no one expects that a photographic map could be wrong. While "photographs have undergone scrutiny in the digital age, and their reliability as indices of reality is continually questioned (since photographs can so easily manipulated with digital technologies)" (Farman, 2011, p. 48), satellite

[10] Apple Maps: http://www.apple.com/ca/ios/maps/

[11] Bing Maps: http://www.bing.com/maps/

[12] OpenStreetMap: http://www.openstreetmap.org

maps and aerial photography have been poorly questioned, and still are considered a static representation of reality.

Let's take Google Maps as example: when moving through an unfamiliar city, for instance, users began to rely on Google Maps to find out where they are, where to go, and the best route to get to a specific place. Google uses our personal preferences and search history to create recommendation lists of places and routes. It is likely that users follow the path suggested by Google and, consequently, become unaware of other (some times better) alternative routes. Hence, as Silva and Frith (2012) observe, "with location-aware technologies, users are able to selectively visualize people, things, and information from their surrounding. Therefore, those who carry these technologies will have a radically different experience of public spaces from those who do not" (p. 155). As a result, places become manipulable and filterable in ways that they could not before.

Space only becomes meaningful with human movement through the mapped space (De Certeau, 2002; Farman, 2011) and not by means of disembodied technologies. Thus, the act of walking in urban space using a mobile device implies a sensorial engagement with the space. For example, Nike+[13], a smartphone application developed by Nike, enables runners to track their routes. Nike + collects GPS signals in short intervals to calculate runner location and speed to draw a run map. The combination of many users using Nike+ produces crowd-sourced digital maps (Fig. 3.1).

Lynch (1964) has already identified that different results could emerge if people designed their own maps using contextual information, rather than using institutional political conventions. So, the power to track our movements on the streets is to take control of the space: our position in space is used to retrieve locational information from the Internet, augmenting our levels of understating and *implacement*. Therefore, by taking control of the space using mobile media, users build new meaning into places: digital mapping becomes not only a form of counter-mapping (Harpold, 1999; De Certeau, 2002), but also a new way of practicing of place. In

[13] Nike+: http://nikeplus.nike.com/plus/

Figure 3.1: Nike+ City Runs: Map showing one year of running using Nike+ in New York, USA (Kuang, 2011).

Lemos' (2010) words, digital maps can "represent people, community and a more legitimate space and place that show how people see and fell their environment" (p. 416).

Farman (2011) notes that digital "maps have also incorporated user data, imagery, and information to create a new notion of spatial mapping" (p. 46), leading to a contestation of the hegemonic power. Silva and Frith (2012) point in the same direction:

> Urban spaces can be represented and narrated in many different ways, producing multiple maps, each of which contains different elements and perspectives of the urban environment ... [mobile media enable] us to connect fragmented locations in the urban landscape, and by doing that, they create new forms of mobility and mapping within the city. (p. 175)

Maps signify a specific look — an ideology produced to fit in the current hegemonic culture. Digital mapping practice might be, therefore, a form of contestation of the structured power and a challenge to hegemonic representations — digital mapping is a way to rebuild and demystify a space.

3.2 Urban Digital Annotation

Half a century ago, Lynch (1964) demonstrated that a region in space is not singularly defined by the constituent power, but culturally produced by its dwellers: each individual pictures the city in a unique way. Nonetheless, he found that there is still a public image of any given city, a general sense that "is the overlap of many individual images" (Lynch, 1964, p. 46). That is, we are somehow stuck between our own experience and the general perception of the space. Johnson (2011) notes that the Internet has offered new opportunities to expand this experience by means of mapped data creation. User-generated content and global connectivity are making the Internet more social: tracking, geo-tagging, social networking, crowd sourcing, folksonomy, blogs, and wikis are the new mode of knowledge production. Moreover, in conjunction with mobile devices, digital annotation also becomes the new way to *write* the urban space.

Mobile media help us to unlock different meanings and experiences of spatialization. Since mobile devices empower people with a means of communication able to both broadcast and aggregate information to and from different sources (particularly user-generated content), multiple images of the city can be produced and retrieved — we are able to easily acquire different perspectives of the same space. Thus, instead of using institutional political conventions, we are capable of creating new territories using contextual information and attaching multimedia information (photos, text, video, sound, or any digital discrete data) to hybrid spaces.

New methods of community formation and experience of space are produced by the numerous distributed geotagging platforms like Flickr[14], Foursquare[15], Wikipedia[16], and Google Maps. For Thielmann (2010) "the process of creating maps and the transformation of geographical data opens new perspectives for local search operations on the Internet, as well as the physical exploration of space" (p. 2). He identifies two types of action that people perform in the hybrid

[14] Flickr: https://www.flickr.com

[15] Foursquare: https://foursquare.com

[16] Wikipedia: http://www.wikipedia.org

space in order to make the mediation process transparent: (1) **annotation** (virtually tagging the world), which seeks to demystify the established space; and (2) **phenomenological** (tracing the action of the subject in the world), which could revalue everyday practices, such as walking and occupying public space. As a result, we are able to produce and share our own perceptions of urban space, and collaborate on large crowd-sourced narratives.

Let me illustrate how mobile media can help us to better understand our history at the same time that it brings a vivid experience of the past. Created by the Museum of London, Streetmuseum[17] uses hundreds of images from its collection to create a unique perspective of the old and the new London (Fig. 3.2). The application takes advantage of the camera and GPS to create augmented realities, combining the present and the past in one single image (Museum of London, 2010). Similar to Streetmuseum, Anne's Amsterdam[18], a mobile app developed by Anne Frank House,

Figure 3.2: A screen capture from the Streetmuseum application overlaying digital images on top of the physical space creating an augmented reality.

[17] Streetmuseum: https://itunes.apple.com/ca/app/museum-london-streetmuseum/id36968433o?mt=8

[18] Anne's Amsterdam: https://itunes.apple.com/us/app/annes-amsterdam/id520476666?mt=8

allows people to explore the city of Amsterdam during World War II through photos, videos and personal stories. The initiative is based on Anne Frank's diary and aims to "connect the past to the present [showing] how the occupation during World War II left its mark on the city and its people" (Anne Frank House, 2012).

According to Farman (2001), the "act of storytelling is indeed an act of inscription. It is a writing of place, of identities, and of relationships" (p. 118). The questions of how attach stories to specific sites, and who has the authority to do so, has concerned storytellers throughout history. Due to our traditional site-specific media (*i.e.*, inscription on infrastructure such as buildings, statues, etc.), which only accommodates a singular story, the spatial narrative favours the hegemonic power. There are, however, counter-hegemonic initiatives that strive to inscribe their own stories through everyday urban mark-up, such as graffiti, signs, and banners. The contrast is in the cultural value attributed to the source and durability of a message, a distinction, for instance, between a statue and a spray-painted wall: whereas both are forms of art, the former represents wealth and authority, and the latter vandalism. It is clear that site-specific stories are controlled by political and economic power.

Mobile media break with this logic and make possible new practices of mapping and storytelling that expand public participation in urban inscription. *Urban Tapestries* (2002-2004)[19], developed by the UK based art group Proboscis, for example, encouraged participants to use their mobile devices to add personal stories, pictures and sounds to a specific location, embedding social knowledge into the fabric of the city, and allowing any other user near to that specific site to retrieve and enjoy. Foursquare is a more contemporary example: by locating the user in space, it shows a list of places nearby — restaurants, airports, schools, public buildings, parks, and so on (Fig. 3.3). Users can either check-in at a place or create a new one. The list of places is crowd-sourced, so people are free to add places that are meaningful to them, share pictures and post reviews and comments. With more than 50 million users and over 6 billions check-ins

[19] Urban Tapestries: http://urbantapestries.net

(Foursquare, 2014), Foursquare not only helps people to explore the city, but also creates new communities around places of interest. Thus, we use geolocation functions to revalue everyday practices and make meaningful connections: with community participation, maps and urban annotation can represent a variety of experiences, looks, and ideologies, enabling other ways to represent space — a lived space.

3.3 Locational Mobile Games

Though portable consoles, like Nintendo DS and PSP, allow people to play anywhere, they do not incorporate the physical environment into the game. Pervasive computer games, on the other hand, enable the link between contextual physical environments and the digital space through electronic sensors, wireless networks, mobile communication, and information devices: they merge urban and digital spaces. Locative games use the city as the game space, transforming movements of everyday life into actions in the game world. Thus, the embodied space becomes hybrid, integrating physical objects, location, and people as assets of the digital interaction.

People have used mobile technologies to interact with space and play games for some time now. Geocaching is one to the earliest GPS treasure hunt type games in which players have to search for hidden caches (real objects) in certain locations (real space) using their GPS device (virtual space). In order to play this type of game, we have to augment our sensorial perception, looking for clues in other spatial layers, in this case represented by the digital information — binding digital information to physical location, we mix realities and create a hybrid space. *Can You See Me now?* (2001)[20], developed by Blast Theory and Mixed Realty Labs, introduces the concept of hybrid spaces in location-based mobile games: "while online players moved through a digital model of the city, street runners acted in the physical city, visualizing the relative position of online players in their Personal Digital Assistant (PDA)" (Silva & Frith, 2012, p. 89).

[20] Can You See Me now?: http://www.blasttheory.co.uk/projects/can-you-see-me-now/

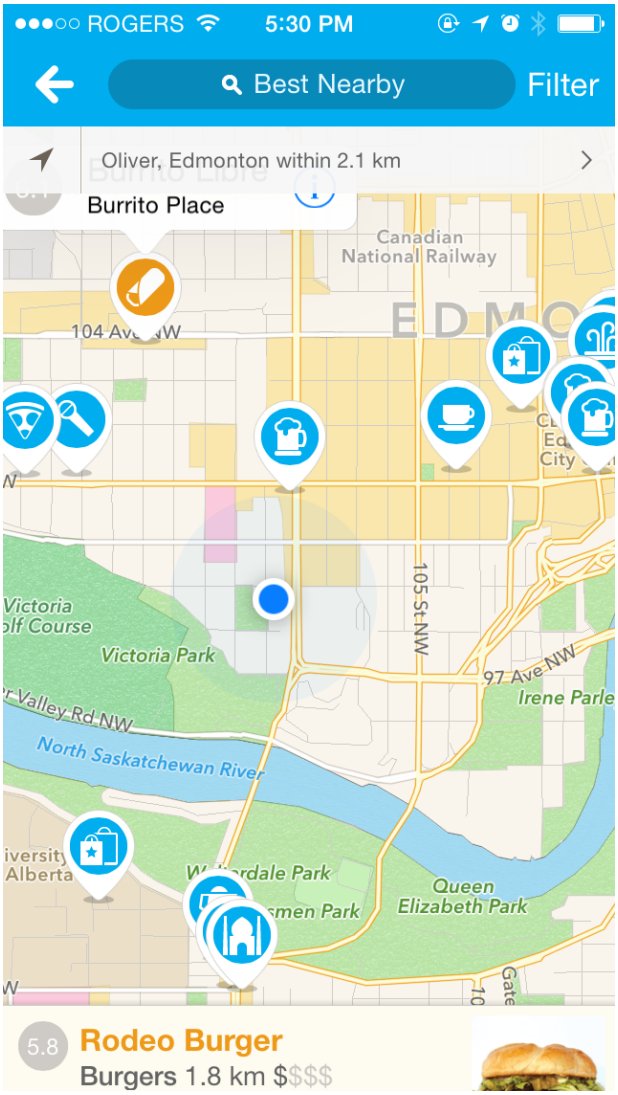

Figure 3.3: Screen capture of Foursquare application showing nearby places, where users can explore and add new points of interest.

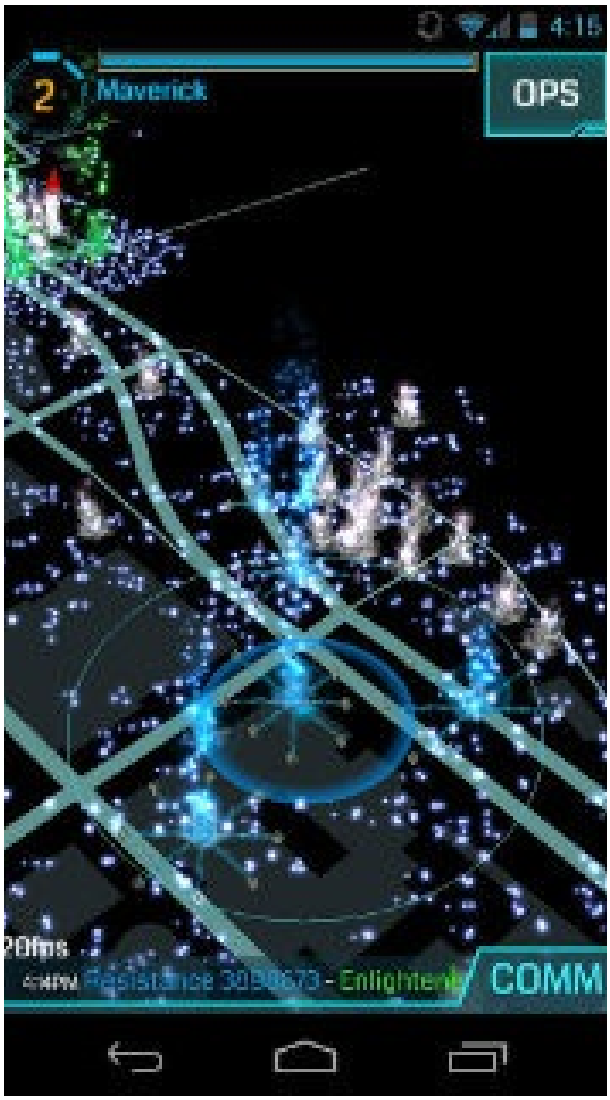

Figure 3.4: Snapshot of Ingress: the gameplay consists of establishing "portals" at public places to create virtual triangular fields over geographic areas.

Locative games evolve and become more complex as mobile technology progresses. According to Lemos (2009), there are three categories of locative games: **Location-Based Mobile Games**, **Mixed Reality Games**, and **Augmented Reality Games**.

Location-Based Mobile Games (LBMGs) integrate players' positions (geolocation) in the real space as a key element of the game. In fact, this is the lower level of integration introduced by the

first generation of LBMG, where a player's position is used to deliver locational information. These games are usually very technically limited, with minimal geolocation functions, made for just one or a few players; yet, they are still able to deliver the experience and constraints of playing using spatial contextual information. Geocaching-like games and Swordfish (2006) are generally used as examples in this category.

In Mixed Reality Games (MRGs) players are in physical space and in cyberspace at the same time. This can only happen with a constant connection to the Internet, so the game can update users' positions in cyberspace based on their physical location. More recently, game developers have been taking advantage of social network capabilities to expand the game environment, producing Massive Multiplayer Online Mixed Reality Games (MMOMRGs) — binding real life connections to game actions improves the challenge and engagement. While that it can be more demanding to take action on the real world (*e.g.*, only being able to act when you are at a specific place, or collecting tokens at a certain locations), MRGs creates opportunities for players to forge new connections or reinforce relationships with places and other people. Most of the locative games today fall under this category: Parallel Mafia[21], *Please Stay Calm*[22], Tiny Tycoons[23], and Ingress[24] (Fig. 3.4) are some examples.

Finally, Augmented Reality Games (ARGs) overlay information layers on top of the first person view of the real space. Lemos (2009) mistakenly identified games like NetAttack[25] and Epidemic Menace[26] as ARGs. Though they were considered a new type of outdoor video game, players had to use a special virtual reality device, making these experiences no more real (and less comfortable) than playing portable video games. Virtual reality replaces the real space as a whole,

[21] Parallel Mafia: http://parallelmafia.com

[22] Please Stay Calm: http://pleasestaycalm.com

[23] Tiny Tycoons: http://thetaplab.com/games/tinytycoons

[24] Ingress: https://www.ingress.com/

[25] NetAttack: http://www.netattack.com

[26] Epidemic Menace: http://iperg.sics.se/iperg_games2.php

while augmented reality uses and adds to the real space. Although today's smartphones have some capability to produce augmented reality experiences, the technology is still in its infancy, and a few developers have been employing this strategy to create games, such as *Zombies Everywhere!*[27], Real Strike[28], and AR Invaders[29].

As we can see, the game experience in mobile games exists in the tension between physical and electronic spaces: it is always tied to the physical space and its features, such as the network's coverage, the access to this network, and the proper rules of the place. However, as mobile games are a novelty, they are not part of the common usage of places. Thus, the act of playing games in space is in itself an appropriation of that space: it has the potential to create a social network among players or bystanders on the street using the urban space as the board game, producing new functions in contemporary urban space. As Lemos (2009) notes, the "use of mobile devices and digital networks expand the scope of the game, producing new types of narrative, new entertainment purposes and new temporary uses and function in urban spaces at specific place" (p. 2).

It is important to note that this spatial convergence raises ethical challenges, particularly surveillance and privacy issues, since we suddenly have the potential for a record that can be subject to widespread dissemination, manipulation, analysis, and so on. For Farman (2011) locational mobile games "are a form of *bricolage*, a type of creative misuse, and through this misuse, players can create a space of critical distance where the process of play can become actions of social critique" (p. 78). That is, both worlds have to interact and collaborate in order to offer a meaningful experience in the production of immersive game space. Since the game space is, at the same time, play and everyday life, every action in the game results in a production of a new meaning in the physical space where the game is being played.

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[27] Zombies Everywhere!: http://uselessiphonestuff.com/?app=zombies-everywhere-augmented-reality-apocalypse

[28] Real Strike: https://itunes.apple.com/us/app/real-strike-original-3d-augmented/id507884100?ign-mpt=u0%3D8

[29] AR Invaders: http://invaders.soulbit7.com

When players move through a space to perform required tasks, "their movements and purposes transform the space as the space of play" (Farman, 2011, p. 86) — it is the movement through the space and the embodied production of space that defines the space. For De Certeau (2002) this is a spatial tactic in which people transform the everyday space, even when they are just walking or wandering in the city. Indeed, if the space, especially the urban space, is strategically purposeful, any change in its original plan can be considered a provocation, or a misuse. Therefore, play is also a form of political statement in which players' tactics embed different meaning to places, which can sometimes even be seen as demand for social change.

3.4 Smart Mobs

As discussed in the first chapter, space is conceived by the hegemonic power, which dictates the 'proper use' of space and regulates life. The ultimate goal is the perpetual reproduction of the established social relations of production, ensuring legitimization of hegemonic ideology while delegitimizing other perspectives. It is in the city, with the increasing privatization of public spaces promoted by economic power that its impact is more intense. Thus, in the (urban) space produced by capitalism, automation and economic infrastructure become more important than human relations, creating social distortions and cultural displacement. For Lefebvre (1992), "the combined result of a very strong political hegemony [...] and an inadequate control of markets, is a spatial chaos experienced at the most parochial level just as on a worldwide scale" (Lefebvre, 1992, p. 62-63).

However, according to Harvey (2012), these big centres are more than just automated life and inequality temples. It is there where people cluster, organize, and act to establish new forms of sociability, identity, and values. For De Certeau (2002), the practice of everyday life creates small transformations of and within the dominant culture in order to make the space suitable to a user's own interest. These transformations, though fragmented and isolated, reflect a set of principles connected to a consumer's activity, culture, tradition, agency, and anxiety. Urban

space becomes politicized in the process of rebuilding itself, putting in question the legitimacy of the space produced by capitalism.

Smart mobs are one of these tactics for mobilization coordinated through decentralized network channels to perform political or aesthetic actions. Salmond (2010) identifies the rave culture as one of the earliest examples of smart mobs: these 'illegal' parties (as they did not secure licensing agreements, etc.) used unconventional communication methods to avoid detection by law enforcement and authority. They often take the form of an "elaborate chain of events such as distribution of flyers at a particular place and time with a phone number to call on a designated date, which would have a recorded message with details of the location"(Salmond, 2010, p. 95).

Today, smart mobs use mobile and social media to communicate and mobilize actions in order to temporally repurpose public and private spaces (occasionally even redefining the space permanently). The logic of smart mobs is the same as social network: rapid information replication through individual connections. While ravers from the 1980s utilized underground networks, the political actions of the 2010s take advantage of technology "in order to connect like-minded individuals and evade the controlling mechanisms of authority" (Salmond, 2010, p. 95). This is a form of contestation, where the community produces new territories.

The urban space is indeed the site where the formation of new claims by informal political actors materializes and assumes concrete forms (Sassen, 2006): *Arab Spring* (Egypt), *Occupy* (USA), and *#vemprarua* (Brazil) are some examples. These political actions are usually very decentralized and make intense use of mobile and social media to disseminate information.

On 25 January 2011, a movement against Egyptian political leaders took place at Tahrir Square, Cairo (Egypt). Participants coordinated the protest from the square using mobile devices to produce their own view of the event, reappropriating the public space into a territory of resistance. Whereas poor information arrived from mass media agents, social network platforms, particularly Twitter, had a relevant role not only in broadcasting local information, but also in

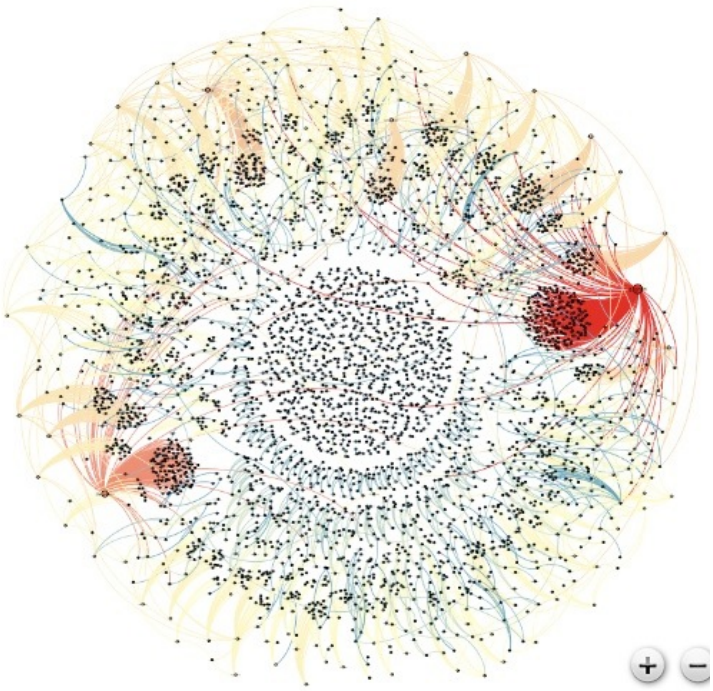

Figure 3.5: The Egyptian Revolution on Twitter, captured by André Panisson (2011), shows a network of tweets from the centre of the movement, in the Tahirir Square, to rest of the world.

organizing the movement. Moreover, the movement cannot be fully understood without the visualization created by André Panisson (2011): by capturing tweets created in the epicentre, he revealed how an articulated community spread information around the world the moment that the Mubarak resigned (Fig. 3.5).[30]

Similarly, the Occupy movement organized smart mobs to protest against the schizophrenic logic of capitalism. Occupy began on 17 September 2011 at Wall Street in New York City's Zuccotti Parkwas (USA), and two weeks later, the movement spread out to almost 1,000 cities in 82 countries. The goal was to occupy public places, transforming squares and plazas into places of resistance in order to *speak* to and against government and economic power. It was a movement organized using a decentralized network on the web, taking advantage of mobile media to mobilize people. Participants also used mobile media as a surveillance instrument in order to

[30] See Panisson, A. (2011). The Egyptian Revolution on Twitter. Gephi. Retrieved from https://gephi.org/2011/the-egyptian-revolution-on-twitter/

catch excessive violence and government censorship. In fact, McCollough (2006) notes: "before raising the usual Orwellian red flag, consider how much more likely than Big Brother are ten thousand pesky 'little brothers'" (p. 27), reversing in some sense Foucault's panopticon.

Finally, the *#vemprarua* movement, also known *Manifestações dos 20 centavos* [20 cent manifestations], had the same characteristics as Occupy. The protest was initially organized against a (20 cent) increase in public transportation fare in São Paulo (Brazil) in early June 2013. Two weeks later, a massive protest spread out across the whole country: between June 17 and 20, more than 2 million people in 100 cities took to the streets to raise their voices. Again, mobile and social media had an important role as tools for organizing, mobilizing, communicating, and broadcasting information.[31] Furthermore, since from the beginning mass media channels (TV and radio) were poorly covering the protests (making a clear statement that they were against the movement), some participants began to live broadcast the event using mobile media devices — a practice named *mídia ninja* — producing an independent and direct communication channel with people outside the event (Fig. 3.6).

Against a constant privatization of the public space, politically oriented smart mobs put in evidence the right to be at a public place in attempt to rescue the space of socialization where democracy can be freely practiced. Despite the peaceful characteristics of these movements, they were brutally reprehended by the state: the police were instructed to remove participants from public spaces, where they have the constitutional right to be, resulting in many injured people and, occasionally, a few deaths.

For these movements, mobile media, therefore, become important tactical tools of resistance in postmodern urban public spaces (De Certeau, 2002). Through a decentralized network, smart mobs could not just organize in one location, but instead be global in scope and form a bigger

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[31] See an analysis of social media usage at protests in Brazil by researches at Labic: Malini, F. (2013). The Battle of Vinegar: Why #protestoSP had not one, but many hashtags. Labic - Laboratório de Estudos em Imagem e Cibercultura. Blog. Retrieved May 6, 2014, from http://www.labic.net/blog-2/traducoes/english-translation-the-battle-of-vinegar-why-protestosp-had-not-one-but-many-hashtags/

Figure 3.6: *Mídia Ninja*: Brazilian protesters began to live broadcast the event to show what mass media hide.

community across multiple geographical spaces. Participants of these "instant communities" may not know each other until the action takes place: they are a group of strangers; they are a multitude.

This multidimensionality of the network connection between different people, places, and political realities, resembles a rhizomatic structure (Deleuze & Guattari, 1980/1987) — discussed in chapter 2: the information flow does not have a predefined pattern behaviour, showing itself in many different ways and forms — no start, no end, no centre, and organized dynamically. Smart mobs are global, dispersed but interconnected, and follow the same structural logic of the economic flow in global cities described by Sassen (2006).[32] Not surprisingly, they are more intense in urban spaces, since the city "constitute the terrain where people from all over the world intersect in ways they do not anywhere else" (Sassen, 2006, p. 29). It is the city, therefore, that concentrates not only the source of contemporary economic power, but also the best chances for social change.

[32] For more on global cities see chapter 1

Summary

The idea that mobile technology serves as interface between people and their environments is not new. Books, wristwatches, newspapers, Walkmans, and cellphones have long been part of our society as cultural technologies used to assist people in interacting with their space. The book, for instance, a reading device created to communicate ideas through time and space, became a tool for people to control and filter their environment, resulting in the production of individualized spaces. Over the last few years, mobile devices evolved with technological advancement embedding different tools, particularly tracking and capture systems, and the capability to connect to other devices, resulting in a convergence across media. New mobile devices, such as smartphones and tablets, have been shifting cultural practices and have already changed how we experience the city and shape our urban culture (Farman, 2011; Lemos, 2010; Silva & Frith, 2012).

Consequently, if at the end of the twentieth-century every aspect of our culture was controlled through the broadcasting technology of mass media agents (Baudrillard, 1983), today mobility and digital networks disrupt this logic, bringing decentralization to social mediation. This results in a paradigm change: mobile media do not follow the same logic as mass media — "a centralized flow of information with an editorial control by big companies in the process of competition funded by advertising" (Lemos, 2010, p. 403). Instead, they operate according to the principles of cyberculture: decentralized broadcast, bidirectional connection and reconfiguration of institutions and cultural industry (Lemos, 2010). Accordingly, digital mobile devices are tools for communication with great potential to decentralize mediation and facilitate civic participation, which not only enable people to consume and produce information in any place, erasing part of the social mediation imposed by mass media agents, but also give us the ability to experience the space in new ways.

Mobile media overlay digital information on top of physical locations, creating hybrid spaces that affect how people experience and represent the space, as well as the social relations among other people. Because of that, location — that is, the current user's position — and context together

determine how people will grasp the information and the space. Thus, mobile media become the interface for our interactions in the hybrid digital-physical space, enabling us to map our location on a mobile app, connect with other people via social media, experience site-based art and performances, participate in a large community through locative games, and interact with location-based narratives.

In fact, these actions fall under the four categories of everyday practice in the hybrid space identified by Lemos (2008): mapping and geo-localization, urban electronic annotations, location-based mobile games, and smart mobs. Digital mapping and urban annotation are now a creative intervention in urban space, shaping both the physical city and the experience of urban life, revaluing everyday practices in the process, such as walking and occupying public spaces. While location-based mobile games add ludic affordances and repurpose physical places into game play environments, political smart mobs occupy and reappropriate urban spaces to question the legitimacy of private spaces and put in evidence the right to be at a public place.

To use Farman's (2011) term, mobile media make us *sensory-inscribed* in space. That is, we experience the space through our body and our sensorial apparatus as well as through social and cultural practices. Hence, the hybrid space produced by mobile media is a not only a direct result of our practices of physical space and our relationship with other people, but also a consequence of how we understand the material and symbolic world in the contemporary society. Technology often serves as a catalyst for cultural and social transformation. So how we deal with technology defines our view of the world and what directions we want to go. But again, mobile media force us to ask the same sort of questions raised by Nichols (1988/2003): *Who designs and controls these systems? For what purpose?* The requirement to use a technological interface, which will mediate us through this new mode of participation, is in itself a form of exclusion.

Conclusion: Responsive Attitude and the Near Future

As I explained in the beginning, my thesis actively seeks to explore the role of mobile media as the new interface to public spaces. Pervasive computing, and mobile devices in particular, are increasingly open, collaborative, and customizable, as well as very controllable and centralized, shaping not only our social interactions but also how we engage with cities, communities, and space. They are, indeed, undoubtedly shifting the balance in social power relations, heading toward a larger concentration of power for those who own the infrastructure (more control), as well as decentralization of access, consumption, production, and distribution of information (more participation).

Before concluding and summarizing what I consider to be the main developments of mobile media and their use to experience the space, this final chapter presents two particular issues and concerns that deserve further consideration. The first section deals with surveillance and power in the context of locational media. Due to the need for a constant connection to the Internet to allow such rich interaction with the space, mobile devices are constantly delivering user's data to a central server. The questions of who owns the data, who has access, who controls it, and what we can do with such (big) data becomes a (big) issue for both those who provide a service and who use it. The second section discusses new forms of spatialization using mobile devices. From the *blasé* attitude described by Simmel (1903), where people sought to enclose themselves into their own and comfortable space, we begin to move toward a more responsive attitude, where we have not only the means of direct interaction with the environment, but also more control and power to make social changes. As a result, new layers of meaning are added to the space, producing a resignification of places by specific groups of people, as well as reappropriations of pubic and private spaces.

1. Surveillance and Power

Location-based services depend on the user's position to work properly and allow them to obtain information about their surroundings. That is, to access and locate information in the space, users have to share, in one way or another, their location. Since this constant exchange of information happens online and it is accessible from anywhere with an Internet connection, governments and corporations can easily track users' personal data, and even ordinary users have acquired similar power. In both instances, this accessibility of personal data raises important issues of privacy and power in public spaces. Or, as Silva and Frith (2012) argue, the "disclosure of location information is not only a concern because it threatens locational privacy, but also because it can strongly reinforce or reshape power relationships" (p. 12).

Take, for instance, Nike+, a mobile app developed by Nike that tracks users' runs and helps them to record, visualize, and comprehend their outdoor exercises. However, Nike reserves the right to keep user's data in its servers with no other way to export the data: *users are not allowed to download their own data*. Almost immediately, a few questions are raised: *Who has access to our personal information? Where is it stored? How can we retrieve and protect it?* We might even ask *who owns our personal data*. On the other hand, users have also gained power over their experience with the space, as well as some autonomy from mass media. To give general examples, locational-based services allow users to see their friend's locations (*e.g.*, Saga[33] and Foursquare), access and upload place-specific information (*e.g.*, WikiMe[34] and GeoGrafitti[35]), connect and participate in communities (*e.g.*, Facebook, Twitter), and even experience the space as an apocalyptic zombie invasion (*e.g.*, *Please Stay Calm*).

Consequently, mobile media cause an imbalance in power relations. Not that these relations were, at any point, even and equal for all. Mobile devices made information production grow

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[33] Saga: http://www.getsaga.com

[34] WikiMe: https://itunes.apple.com/ca/app/wikime/id286865365?mt=8

[35] GeoGrafitti: http://www.geografitti.de

exponentially, shifting mediation power. Social mediation has a different balance in the post-mass media era than it had during the mass media pinnacle.[36] But this change is contradictory at its core: toward a larger concentration of power for those who own the network infrastructure, but also contributing to the decentralization of this power among the participants of a network. Perhaps this is what Enzensberger (1970/2003) meant when he argued that contradiction between producers and consumers is not inherent in electronic media. His principle of reversibility points to a network-like infrastructure capable of giving people the means to write their history by themselves: via "mass newspaper, written and distributed by its readers," through "video network of politically active groups" (Enzensberger, 1970/2003, p. 267), or, to put it more recent terms, by means of the interconnected digital platforms: websites, blogs, social media, and locative media.

Notwithstanding, power is more than simple means of control over people and places. In fact, power is not localized in the hands of specific people or institutions. Rather, it should be understood as "a network, or a chain, something that circulates and moves, rather than a static thing" (Silva & Frith, 2012, p. 138). Ergo, people are vehicles of power, not a point of application. That is, from this perspective, mobile media alone do not empower people to interact with each other or with the space; instead, these "technologies are also elements of a power network that has the potential to discipline people's movements through space, and the social relationships in it" (Silva & Frith, 2012, p. 138). Thus, the simple fact that a machine tracks people's locations (and any object in space) and produces new connections, can affect interpersonal relationships, mobility patterns through the city, and our relations to places.

Since mobile media also favour decentralization, top-down surveillance is not the only way that control can be practiced. Mobile media interface the network in which people, institutions, and corporations have awareness of each other's location, shifting the relationship between users and places as well as the social relationships in these places. Since individuals now have access to

[36] See chapter 2 on media history and theory.

surveillance technologies able to track and record any sort of data, who surveils and who is surveilled becomes a much more ambiguous issue.

Nevertheless, the knowledge produced and broadcast by mobile media is not always reciprocal, maintaining an asymmetric power relation. Whoever holds the technology and owns the infrastructure dictates what (or who) is controlling what (or whom), and where information can flow. Silva and Frith (2012) claim that these location-based systems are bringing us to a *commodification of location*, in which locations are translated into digital objects that can be salable and tradable: "location then, begins to have power and meaning in itself" (Silva & Frith, 2012, p. 144). Thus, locations are imbued with values, not necessarily new, but more widely available for users with means of access. Lefebvre (1992) argues that space is a social product; and in the case of our capitalist society, we produce spaces of consumption. Consequently, the new space produced by mobile media represents an extension of the same logic with some additional elements, for example the ability to attach information to places and receive place specific information.

It is important to note, though, that mobile media's users will perceive locations differently not only from non-users, but also among other users. These new spaces are very customizable, creating an individualized experience of the space, which has been much explored in location-based applications and location-based advertising. By tracking users' locations and daily habits, location-based systems filter out specific locations in which users are not interested, and highlight places where they are more prone to go. In fact, these systems are promising customization and individualization in exchange for content surveillance.

2. New Forms of Spatialization

Farman (2011) states that mobile technologies make us *sensory-inscribed* in space. That is, we experience space through our body and our sensorial apparatus: "embodiment is always a spatial practice [...] rather than something that is a given" (Farman, 2011, p. 18-19). There is a spatialization process, in which the body produces its own space and is inserted into space, or as Lefebvre (1992) writes, "each living body is space and has its space: it produces itself in space and it also produces that space" (p. 170). On the other hand, we also experience the space through social and cultural practices. By interacting with other people, objects, and the environment, culture allows us to produce something meaningful. This is a dialectical relationship: while embodied agents create culture, they are, at the same time, created by culture. Our body, our space, and our technology are all created within culture, shaping one another and transforming culture through an interdependent relationship: "culture is reworked from the inside by embodied interactors designing and repurposing technology" (Farman, 2011, p. 25). Space and body, therefore, exist through their dialectical use, which again is a combination between our sensorial apparatus and social-cultural relations.

As we can see, the usage of mobile technologies, its social relations, and the relationship with the material and symbolic world in contemporary society, produce a new form of space: a hybrid space framed with elements of both the digital and the real space, or as Lemos (2010) calls it, an *informational territory* — a digital information flow that intersects urban space and cyberspace. Mobile media reinforce the importance of space and place in the development of sociability and the construction of people's identities.

In the context of mobile media usage, our physical location defines how we interact with types of information we access, which in consequence makes digital and physical space very tight with each other: "one no longer 'enters' the Internet — it is all around us" (Silva & Frith, 2012, p. 169). Nonetheless, as Lemos (2010) points out, our connectivity with the digital layer still has to deal with real space's relationship issues (*i.e.*, regulations, laws, subjectivity) in order to constitute a

"new sense" of place. Therefore, the way we interact with real spaces depends on our intentions and attitudes in relation to not only the space and other people in that space, but also the cyberspace, which results in a production of certain types of hybrid spaces.

2.1 *Blasé* Attitude

Note that previous forms of mobile media produce a specific type of space: a very close and individualized space. Some scholars refer to it as a "bubble," in which people attempt to isolate themselves in customized spaces as a form of protection, to make real spaces more comfortable. In the so-called information age, we are producing an unprecedented amount of information, ultimately causing a saturation of humans' sensorial inputs. As Simmel (1903) had already observed at the beginning of the twentieth century, people had to develop ways to deal with the overstimulation of urban spaces — too many people, too loud, to bright, too much information. Hence, to restore mental state and keep their sanity, Simmel (1903) argued that people had fragmented their space, focusing and filtering their attention, developing a ***blasé* attitude**: a person "reacts with [their] head instead of [their] heart" (p. 410).

For a long time people have used different tactics to isolate themselves from social interaction, or at least filter some of the unpleasant and undesired information. As I described in the third chapter, mobile media are among these tactics: while books and newspapers can be used to produce a visual occlusion, personal music devices create a sound barrier between the individual and the space. Some scholars argue that mobile technologies "withdraw" people from public spaces (Itō *et al.*, 2006). Thus, as smartphones and tablets *remediate* the book and the Walkman (Bolter & Grusin, 2000), new mobile devices can be used to reach the same goal, maintaining users' ability to build individualized space in a similar fashion to Simmel's *blasé* attitude.

However, Silva and Frith (2012) argue that this logic is reversible. Rather than serving as an escape from space, people use these tactics — the *blasé* attitude and deliberated use of mobile media — to actively "interface their relationship to other people and the space around

them" (Silva & Frith, 2012, p. 27). Thus, instead of withdrawing from space and producing isolation, mobile media can help people to interfere and expand their participation in the production of space.

2.2 Responsive Attitude

While for Simmel (1903) the early twentieth century's urban life was portrayed by its aversion and indifference, the digital technologies of early twenty-first century are bringing back feelings of connectivity and community belonging. Lemos (2010) insists that digital networked communities can exist physically apart: "if we think about place as flow and events and mobility as a way to get together, we can see communities as a mobile form of association, not only a rooted experience in rigid place" (p. 415). That is, community is not only made by physical proximity, but more than ever through mutual interests. To be part of a community is to be connected all the time, either face-to-face or by digital means.

Whilst previous mobile media have been utilized exclusively to produce individual spaces as an attempt to filter overstimulating information, new mobile media go in the opposite direction. Due to a digital mobile device's capability to track, capture, and store information, as well as many-to-many communication in movement, they are opening new opportunities for participation in the production of the space. Mobile media allow people to develop what I call a **responsive attitude**: to create, publicize, and share information in order to reappropriate spaces.

Thus, mobile media produce two types of spatialization, which can seem to complement each other. In the ***blasé* attitude** people operate the space by filtering, sorting and selecting the information they want to consume, resulting in an individualized space. Through **responsive attitude** operations, on the other hand, people can create, publicize, and share information, enabling them to build collective spaces and assign new meanings to places (table 4.1).

As a consequence, the information we access through mobile media is different from old media, especially from mass media, because it can come from many sources. As Silva and Frith (2012)

Table 4.1: Blasé Attitude x Responsive Attitude

	***Blasé* Attitude**	**Responsive Attitude**
Operations	Select, Sort, Filter	Create, Publicize, Share
Orientation	Consumption	Production
Product	Individualized Space	Collective Space

observe, there is a contrast between the information provided by a journalist, who works for a newspaper with a particular agenda, and the crowd-sourced data produced by a wider public. Even if mass media still has the authority to report the facts, the "diversity and amount of location-based information that an app can hold is much greater than what is published in a traditional paper" (Silva & Frith, 2012, p. 170). So, people tend to have different experiences when they use location-based apps, as opposed to following mass media. For example, people are more prone to participate in political acts when a friend directly invites them. As a result, mobile media allow people to narrate, represent, and map space in many different ways, producing new forms of mobility, community, and urban experiences.

This new form of production of space allows people to take control of inputs and outputs of digital information in an urban space: "adding information to places does not eliminate them, [...] but it actually produces new meaning and new functions" (Lemos, 2009, p. 9). For example, when searching for Wi-Fi hotspots, people can choose to go to one place instead of another; mapping places changes the way we perceive and interact with the city; accessing and creating information through social network platforms shifts the way people produce content about their urban experiences; playing location-based mobile games displaces the common urban space into a ludic environment; participating in a civic movement can change how we perceive public and private space.

2.3 New Heterotopias

We are always in movement; uses of urban spaces are transitory, temporary, and usually follow some sort of rule or pattern, as we come and go from home, school, parks, shopping malls and so on. Nevertheless, movements of contestation and reappropriation of urban spaces also emerge in all kind of places, resulting in a displacement of the original purpose of space without even changing the space itself, such as the use of streets, parks, and buildings for artistic expression (*e.g.*, *graffiti*, performances), sport practice (*e.g.*, skating, *parkour*), and political actions (*e.g.*, protests). As I discussed in the first chapter, this spatial breach, called a heterotopia by Foucault (1984), can both hide and reveal different aspects of a given culture, or even contradict the experience of a given place. It is a hybrid space, not always obvious to most people, but very present to the participants of enacted activities, which affects how they experience the space, place, community, and mobility.

The electronic network infrastructure of urban areas (Wi-Fi hotspots, cellphone access network, RFID, Bluetooth) and the spatial interaction created by mobile media constitute a hybrid space, or a new form of heterotopia: a digital layer that crisscrosses and overlaps the physical landscape, introducing new ways not only to interact with the city, but also to reappropriate and virtually augment the urban space. Location-based mobile games, for example, open the door for a parallel reality using the physical environment as the game space. The valuable information in the game is only accessible at specific real locations, which are not necessarily compatible between each other: an office building becomes a castle, and a school is transformed into a shelter, for example. Nonetheless, even though the game play may happen in a public space, only players are allowed to enter into the game's domain. As non-players are not aware of the game, they are excluded from the game space. That is, the fact that one is experiencing the real place in only one dimension excludes them from the heterotopic space created by the game.

Nevertheless, heterotopic spaces do not always hide or conceal other dimensions. Sometimes they act as a way to either expose or replace real spaces. This can be the case in digital mapping

and urban annotation, such as Streetmuseum and Anne's Amsterdam: through augmented reality experiences they not only unlock our history and expose our past on top of the present space, but they can also reveal the contradictions of a given space through time. Ergo, mobile media's hybrid spaces can be seen as heterotopias constantly being produced, lived, and destroyed by digital mapping, urban annotation, mobile games, and smart mobs, in which communities are quickly formed and dissolved with a great diversity of interests: political, economic, cultural, personal, and above all, social.

3. Mediations of Space and Digital Reappropriations

Space has so many different dimensions that it is not an easy job to come up with a precise definition. In fact, there is no conclusive definition of space, since the concept has many contrasting meanings across many different disciplines: from the physical location where our body lives, to the abstraction of our psychological state; from exact locations on the earth's surface, to social-cultural produced places with no physical boundaries. We are constantly being confronted by an indefinite multitude of spaces, each one contained within or piled upon another: geographical, economic, demographic, sociological, ecological, political, commercial, national, continental, global, and so on. As all of them describe spatial practices and social uses; we should not consider space in isolation, but rather as a social product. Or, as Lefebvre (1992) asserts, (social) space is a (social) product.

Each society produces its own space based on its own rules, culture, and system of production. The triad proposed by Lefebvre (1992) — spatial practice, representation of space, and representational space — helps us to understand how space affects and is affected by different social actors. While representation of space presupposes a *strategy* of signification of a place, a definition of its proper rules and uses, usually conceived and imposed by the dominant power, representational space is the transformation of this place by everyday life, or, as De Certeau

(2002) calls it, *tactics* of everyday life for reappropriation of space that can change and even break its proper rules. Finally, spatial practice is the dialectical interaction that propounds and proposes the spatial relations — it is the synergy between the production and use of particular locations. De Certeau (2002) identifies this dialectical interaction as the relationship between the 'proper use' of things and the ordinary usage: it is exactly this tension that defines places and regulates life.

Space then, is not a prior, neutral, or passive canvas for social relations, but an active force that reflects values, ideologies, and power structures of a given society. According to Lefebvre (1992), the production of space is "subordinated to a centre or to a centralized power [...] which works as power's proxy" (Lefebvre, 1992, p. 9). In the case of capitalism, it is controlled by hegemonic forces (*i.e.*, who owns the means of production) that insist on maintaining property relations. Its values replicate themselves through a variety of methods, including social construction of space such as architectural design, physical construction (buildings and monuments), and information channels, particularly those which reach large audiences, namely mass media.

Mass media developed through the popularization of mechanical reproduction machines (gramophone, film, and typewriter), followed by the dissemination of broadcast devices (radio and television) during the twentieth century. With great mobilizing power and the ability to instantly transmit information to a wider and diffused public, erasing the distance between the speaker and the audience, mass media was quickly transformed into a political instrument by the hegemonic power as a way to keep control of the means of production. In fact, mass media was so overheated in the second half of the twentieth century that Baudrillard (1983) saw a rupture in the notion of truth and reality: "all media and the official news services only exist to maintain the illusion of actuality of the reality stakes, of the objectivity of the facts" (p. 71), and, because of this, they become detached from their own objectives, committed to "power effects and mass simulation"(p. 41). Ergo, the mass media's ultimate goal is the perpetual reproduction of the established social relations of production, ensuring legitimization of its own ideology while delegitimizing other perspectives.

Nevertheless, the advent of digital media (computers and the Internet) certainly brought back Enzensberger's (1970/2003) concept of a 'network-like' communications model. People are now not only able to choose from a broader number of information sources, but are also free to produce, comment on, and distribute their own content, giving shape to a critical mass that could confront the mass media dictatorship. In fact, this new paradigm in social media shifts mediation from a 'one-to-many' direction to 'many-to-many,' resulting, therefore, in a crisis of authority in mass media culture. Instead of a static and hierarchical organized flow of information, communication is multidimensional, made of dynamic and decentralized network connections between many sources. The multidimensionality of the network connection in the Internet resembles a rhizome (Deleuze & Guattari, 1980/1987): no start, no end, no center, and organized dynamically. This paradigm shift leads to a *post-mass media era*, where the decentralized network expands over the traditional channels, operating according to what Lemos (2010) calls three basic principles of cyberculture: (1) **decentralization of emissions**, (2) **bidirectional connection**, and (3) **reconfigurations of institutions and cultural industry**.

It is in the context of intense use of wireless communication technologies and the possibility of massive participation in the production and distribution of information that mobile media emerge as way to increase the capillarity of involvement: the potential to interface the interaction with space and other people whenever you want, wherever you are. New mobile technologies, such as smartphones and tablets, are pushing the Internet even further, adding permanent data entry during physical movement. Thus, mobile media add a new layer of information onto space: the hybrid space, composed by a digital layer that overlaps the physical environment, introducing new forms of interaction with urban spaces, as well as encouraging reappropriation of private and public spaces.

While previous mobile media (*e.g.*, books, and personal music devices) reproduce and even help people build individualized spaces in order to avoid social contact with strangers, what Simmel (1903) called the *blasé* attitude, digital mobile media reverse this logic and open new opportunities for community formation and participation in the production of space. I am calling

this new form of spatialization a **responsive attitude**: users are able to create, publicize, and share information in order to reappropriate spaces. The responsive attitude points, therefore, to a reconfiguration of space through technology, sensors, and digital mobile networks. Thus, instead of closing themselves in a bubble, people are able now to narrate, represent, and map the space in many different ways, producing new forms of mobility, community, and urban experience.

Mobile media's responsive attitude can be classified in four types of everyday practice in the hybrid space: (1) **digital mapping** and (2) **urban annotation** unlock different meanings and experiences of spatialization in urban spaces; (3) **location-based mobile games** repurpose physical places into game play environment; and (4) **smart mobs** enable reappropriation urban spaces to question the legitimacy of private spaces and put in evidence the right to be at a public place. This new form of production of space allows people to take (at least partially) control of inputs and outputs of information in urban space. That is, users can control what they receive and have the means to produce information in the digital layer, though they still have to deal with other forms of power and control present in any physical place. This is exactly the representation of the "shift of power as disciplinary confinement (Foucault, 1984) to tracking and control mobility (Deleuze, 1980): CCTV, passwords and profiles, RFID tracking systems, cell phone ID surveillance, GPS tracking, and so on"(Lemos, 2008, p. 97).

Therefore, mobile media neither withdraw people from places, nor even erase the space. On the contrary, "adding information to places does not eliminate them, [...] but it actually produces new meaning and new functions" (Lemos, 2009, p. 9). This new form of spatialization, or another way to give meaning to places, creates what Foucault (1984) calls a heterotopia: new functions of place emerge without changing the physical landscape. As a result, a place "gains a new layer of information that is a new territory created by electronic networks and mobile devices" (Lemos, 2008, p. 96).

While it is important to note that the use of technology to interface with space is not new, we should also acknowledge the changes that emerge with newer types of mobile technologies. Mobile media redistribute power in society, enabling new ways to engage, understand, and participate in public and private spaces. Thus, regardless of the type of space produced (physical, digital, hybrid, heterotopic), the user's attitude (*blasé* or responsive), or the method used to transform the space (mapping, digital annotation, mobile games, or smart mobs), mobile media have a big role in the production of space in the contemporary society.

As technology evolves and the adoption of mobile media increases, we need to think through the opportunities and consequences of new forms of interaction with each other and with space. Mobile media are already one of the components to build a better and smarter urban space. As Cohen (2013) puts it, smart cities have to

> find ways to become more efficient, to deliver more services via mobile technology, to optimize existing infrastructure, and to leverage citizen participation to create better land-use decisions and to break down bureaucracy in order to stimulate a creative, entrepreneurial economy. (para. 2)

Consequently, the city becomes a hybrid urban space that merges digital and physical worlds. Furthermore, with all sorts of *smart* devices, especially hands-free wearable equipment, such as glasses (Google Glass), and watches (Samsung Gear, and the rumoured Apple iWatch) becoming available to a wider audience in the near future, we will see a more pronounced used of locational media in everyday life, and certainly an increase in augmented reality experiences. These new form of interfaces with the space and everyday life raises important questions: How does the aggregated information produced in the digital level affect everyday life? How should privacy issues be managed? What are the boundaries between public and private space? What will the boundaries between digital and physical space become?

It seems that now we have some sort of power of our own not only to control our personal space, but also to interfere in the public space. Yet, we may not perceive every detail of our own world

and our place in it. For instance, when talking on the telephone, people abstract all ambience noise to focus on the conversation; the same sort of thing happens with the interface of mobile devices. Both recede to the background, to the level of the cognitive unconscious. Farman (2011) affirms that these elements are sometimes the most telling characteristic of a lived space, "the behind-the-scene, the off-stage, and the hidden-from-view often serve as the foundation for the perceptive world" (p. 29). It is at this level, through *interfaceless interface*, that hegemonic power is exerted: whoever owns and controls pervasive computing systems also has some control over our sensorial engagement with the world.

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