Harvesting the Interactive Potential of Digital Displays in Public Space: The Poetics of Public Interaction

by

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Abstract

A digital public display is a platform of media architecture that can either take the form of a large-size stand-alone screen, which relies on LED, LCD or plasma technology, or else a video projection that illuminate the façades of buildings in dark settings. Like nondigital advertising billboards since the nineteenth-century, digital public displays typically tend to be used to deliver commercial content, publicize news and offer context-relevant information in accordance with the elementary one-way transmission model of communication. As a result, until recently, most public media displays remained non-interactive. But now that computational systems can support digitally-mediated interactions on this platform, interactive screen technology is becoming an increasingly common component of new urban digital infrastructures in semi-public and public space.

This doctoral research examines how the interactive potential of digital public displays might be unleashed at the scale of the built environment if designers were to focus on their public vocation and their social affordances. In the past decade, display-based systems have mostly been studied, designed and produced top-down style by experts. However, some researchers have called for new methodologies that could help effectively bridge the gap between the top-down prescriptive design approaches and the bottom-up appropriative digital practices that shape the *in situ* usages of this urban technology. This doctoral work strives to take up this challenge by demonstrating that multisited design is an approach that can be used to shape the conception and function of interactive digital public displays in the context of urban infrastructural planning.

An interpretive outcome of participant observation, this dissertation also reports on field observations made over two years, presented as a narrative punctuated with micro-analyses on design research. This further contributes to the literature by, first, implicitly suggesting throughout that the concept of real time *public interaction* can provide an abstraction that facilitates thinking about the design of interactive digital public displays; second, presenting thick descriptions that evoke four new possible purposes for this platform; and third, developing the concept of *social affordances* tailored to public space.

Keywords: interactive dynamic digital displays; public interaction; social affordances; multisited design; technology infrastructures; urban computing.

Dedication

I dedicate this research to my mother to whom I owe everything. She passed too early in life. I have always considered it a great responsibility to accomplish achievements that she could not have in her lifetime. I also dedicate this work to my daughter for whom I set out to achieve more than I thought I ever could because I knew that this was the only way to be an effective female role model. Mahatma Gandhi's dictum, "you must be the change you wish to see in the world," must also speak to changing the world by transmitting knowledge and legitimizing ways of being from one generation to the next.

Acknowledgements

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List of Acronyms

term	full form of the term
CRIM	Centre de recherche informatique de Montréal
CSCW	Computer-Supported Cooperative Work
HCI	Human-Computer Interaction
MC	Master of Ceremony
MF	Moment Factory Inc.
NFB	National Film Board of Canada
NUI	Natural User Interface
PD	Participatory Design
POE	Post Occupancy Evaluation
SIAT	School of Interactive Arts & Technology
SFU	Simon Fraser University
TMSP	Technology-mediated social participation
UQAM	Université du Québec à Montréal

Glossary

term	definition of the term
crossmodal interaction	the isolation of a process by which an input signal drawn from a single modality produces output signal(s) across one or more *different* sensory modalities, as for instance, how one sound input can be transduced into visual, proprioceptive and haptic outputs (Fortin, Hennessy, Baur, & Fortin, 2013, pp. 93-94).
cultures of participation	concept developed by Fischer (2011) to describe how "the rise in social computing (based on social production and mass collaboration) has facilitated a shift from *consumer cultures* (specialized in producing finished artifacts to be consumed passively) to *cultures of participation* (in which all people are provided with the means to participate)" (p. 42).
cybrid space	according to Beiguelman (2009), *cybrid* configurations are "situations resulting from the on- and off-line networks' interconnected experience, that occur in the traffic mediated by control systems, electronic panels, cell phones, PDAs and intelligent agents" (p. 180).
extensibility	property of a computer system or software that enables it *to be extended* to include new functionalities and structures while preserving old ones in order to take accommodate future possibilities for development (Pipek & Wulf, 2009, pp. 456-457).
glocal	term that conflates the concepts of global and local, its meaning is fraught and thus determined by the context it is used in. Here, it specifically designates cultural practices that refer to how a local culture might absorb global influences found useful while adapting them for local usage (Friedman, 2007, pp. 421-422).
interface	the use of the term "interface" and "interfacing device" in this dissertation specifically refer to the term "user interface", which designates the visible layer or part of an interactive computer system between the end user and the program as illustrated in Campbell's (2000) simplified diagram of the structure of a computer (p.134). By mediating and modulating the input data and output data, the interface allows end users to communicate with the invisible components of a digital technological artifact.
in-the-wild aka in the wild	term used to designate a research setting or context where "the locus of control shifts from the experimenter to the participant", and in which effects are difficult if not impossible to control; also often used synonymously to *in situ* (Rogers 2011, pp. 58-59).
media architecture	a space or field comprising physical structures that utilize digital media to passively or interactively broadcast information to their immediate vicinity (Vande Moere & Wouters, 2012, p. 1).

net neutrality	framework for "a political and regulatory debate concerning whether ISPs should be able to introduce traffic-routing policies that favor particular sorts of network traffic such as that to and from their commercial partners" (Dourish & Bell, 2011, p. 97).
offline	term used to describe digital practices that are performed *without online connectivity* (Fortin & Hennessy, 2015a, p. 352).
to reverse-engineer	given that in this work, the use of this verb has philosophical roots, its definition bears a close comparison with the domain of poetics, which Bordwell (2008) defines in these terms: "the poetics of any artistic medium studies the finished work as a result of a process of construction – a process that includes a craft component (such as rules of thumb), the more general principles according to which the work is composed, and its functions, effects, and uses [*sic*]" (p. 12). To reverse-engineer is thus to study and identify these structuring principles.
scalability	the inherent potential of a computer system or software to be *scaled up* or resized in order to work for a larger numbers of users, platforms, outputs, etc. (Townsend, 2013, p. 165); in relation to computer graphics, Manovich (2001) defines it as a process "in which different versions of the same media object can be generated at various sizes or levels of detail" (p. 58).
tag cloud	Smith (2013) defines tag clouds as "a form of information visualization which are a part of the social media terrain and act as markers of a web 2.0 influence on a website...Tag clouds typically appear as a combination of words in different font sizes, where each word is hyperlinked. They are often produced by the tagging of digital assets such as text, photos and videos with meaningful words. Individuals and/or communities of end-users carry out the tagging. The words in the largest size font typically represent the tags most frequently assigned" (p. 905).
transmission model of communication	a one-way process where information is simply transferred from one person (sender) to another (receiver), following the elementary transmission model of communication first theorized in the 1960s (Shannon & Weaver, 1964, pp. 33-34).
ubicomp	a moniker that serves as a shorthand for the term "ubiquitous computing", which was coined by Weiser (1991) to designate new research fields that study the use of pervasive computing resources that have become so seamlessly present in our daily environments that we barely notice them (p. 78). This signaled a major shift in HCI design thinking as it repositioned research on "human-to-human interfaces instead of human-to-computer ones" and focused on how computers were embedded within the complex social framework of daily activity, and how did they interplay with the rest of our densely woven physical environment [*sic*]" (Weiser, Gold, & Brown, 1999, pp. 693-694).

Preface

When the ethnographic inquiry is multi-sited, at what point and where does an investigator become a participant observer? This dissertation is an ethnography that reflects on these questions in relation to the design of interactive digital public displays.

Diptych showing principal investigator making onsite observations and taking field notes during phase two of this doctoral research.

Mégaphone deployment, Promenade des artistes, Montréal, Canada, October 11, 2013.
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Chapter 1.

Introduction

For the goal of poetics is to provide a means to 'infer, from how a work is made, the way in which the work wanted to be made'. In a finished work, one looks for 'traces of intentionality'. (Eco, 1977, qtd in Turnovský, 2009, p. 44)

From its very onset, this doctoral research was premised on a single overarching objective: that of attempting to describe some of the major design factors that might help practitioners better harvest the interactive potential of digital displays in public space. Three years of research applied to this object of study, and two years of intermittent fieldwork were the starting point of a probing contemplation on the peculiar character of this multi-user platform. In keeping with the inductive approach that generated this dissertation, its structure emerged from an exploratory process in the context of which understanding how to frame the problem gradually became the inquiry itself. As Spradley (1980) observes, in ethnographic inquiry, the pattern of investigation is cyclical rather than linear (p. 26). One could add that it is more like a spiral that opens out in depth and breadth with each rotation than it would be a magic ring that closes onto itself without beginning or end. Accordingly, interpretation followed from a recurring series of stages consisting in observations – analysis – writing – feedback – synthesis. In retrospect, it seems that it was by iteratively engaging with the "problem" through this cycle of abductive reasoning, that this problem gradually became the solution. In this sense, understanding the object of study might be compared to the photographic process: a latent image reveals itself as it is slowly transformed by the developing agent.

The original impetus of this work was a research question that was more or less articulated in such terms as: what happens when digital public displays enable a two-way flow of interactions instead of a one-way mode of information delivery? And early versions of this investigation outlined the research objective as the need to develop "a

more participatory model that would facilitate new forms of social, cultural and political interaction" (Fortin & Hennessy, 2013, p. 1). Here, the distinction between each of these categories of interaction that can be supported by technology was defined as follows: *social interaction* relates to having more meaningful exchanges with people by cultivating a greater awareness of them leading to different forms of interpersonal engagement; *cultural interaction* includes all practices of community-building and place-making that are expressions of a sense of belonging and collective identity; and *political interaction* involves actions that work towards the development of diverse public spheres, civic life and agency. A score of literature reviews later, and after ample reflection on, and analysis of, the empirical data collected over almost two years, it became clear that the axiom of this research was, in fact, *public interaction*, a concept robust enough to include the wide gamut of social, creative, artistic, political and civic interactions that digital public display systems can be designed to support, but a concept also specific enough to capture this platform's key feature: its public vocation.

But what is public interaction? Attempting to answer it here would seem highly premature as it is this question that threads throughout this dissertation; it is this question that warrants doctoral work undertaken over three years; and it is this question that may help validate and contribute design knowledge that could be applied to the making of interactive digital displays deployed in urban environments. One chapter at a time, this inquiry will deliberate on *what is public interaction,* from the particular to the general, from praxis to theory, from its manifestations to its applications – and from engaging in a constant back and forth between empirical data and the extant literature in the reporting of this research. In approaching the subject in this way, this study seeks to suggest that for the purpose of design research, public interaction could be reverse-engineered. By culling field observations on how people behave around digital public displays, might it be possible to identify some of the organizing principles that could help create or better support the material conditions for public interaction? Can the context of technology design in public space provide a fertile common ground for new communication models?

In the introduction of their book on behavioral economics, Thaler and Sunstein (2008) suggest that the order in which food options are presented in a cafeteria "nudges"

children into making some food choices over others (pp. 1-2). They describe the designer of this environment as a "choice architect", one who organizes the context and conditions in which people choose to behave (p. 3). Unsurprisingly, the book has been criticized as supporting the practice of social engineering, but extended to interaction design, the concept of nudging can be viewed as a useful tool. For instance, Hornecker, Marshall and Rogers' (2007) concepts of *entry points* and *access points* applied to large displays can be construed as design nudges: they respectively invite and structure interaction (p. 330). In this spirit, the analyses and narratives in this doctoral dissertation aim to provide further understanding on how to improve the design of interactive digital public displays by nudging end users to engage in various forms of public interaction.

The way it proposes to do this is by investigating the poetics of public interaction. Plato and Aristotle's classical definition of poetics refer to the rules and conventions by which we make things (*poiesis*) as a result of thinking (*noesis*). According to Bordwell (2008), "any inquiry into the fundamental principles by which artifacts in any representational medium are constructed, and the effects that flow from those principles, can fall within the domain of poetics" (p. 12). While this definition implies that the object of study must be a text or an artifact, other authors have suggested that it can also apply to a process. Bachelard's (1964) writings on the poetics of space suggest that making is an emergent action, which involves a constant re-contextualization of existing memories, thoughts and dreams that all become inextricably reconnected every time "the bright light of imagination" shines upon them (p. 175). In keeping with the empirical foundations of the phenomenological tradition, Bachelard's notion of poetics was rooted in the experience of being in the world, of simultaneously receiving it and acting upon it. This work draws from all these conceptions because together, they are germane to design research in human-computer interaction (HCI). To *engage with* the poetics of something is to attempt to understand its design structure through reason or experience, depending on whether one aims to explicate its production or simply place oneself within its nexus.

> Poetics is related etymologically to the Greek term, *poiein*, which means, "to make". This is the root of the term *poiesis*: fabrication, production. For Plato, poietic philosophy is knowledge that serves in the production of something, for example, the making of architecture [*sic*]. (Turnovský, 2009, p. 43)

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In his book on literary criticism, *The Open Work*, Eco (1989) describes poetics as a "formal model" which communicates the structural plan of a work (pp. 177-178). Although with Eco, poetics refers expressly to literature and its systems of rules and prescriptive norms, it equally alludes to the idea that human activity typically *makes* by composing a system or a state of order that organizes elements according to a set of patterns that can be construed as principles. The study of poetics thus aims to understand this order and these principles. In this sense, design is intrinsically connected to poetics. For as Agamben remarks, "the poetic act – the act of creation – coincides with the exercise of the *techne*" (European Graduate School, 2015,~8min); and according to Heidegger (1971), the Greek word *techne* (technique), "means neither art nor handicraft but rather: to make something appear" (p. 159). From this, one can infer that to explain the poetics of something is to make its design appear: to reverse-engineer a design consists in laying it bare by inductive reasoning.

This doctoral dissertation is, first and foremost, an empirical study on the interactive potential of digital public displays, but by extension, it is also a contemplation on the poetics of public interaction. It is an interrogation that seeks to identify some of the conventions of public interaction as a cultural and spatial practice, an attempt to understand whether or not there can be some key organizing principles that structure public interaction to provide insights on how HCI design research can best support it.

Public interaction has its own history in HCI research on displays. As far back as 2003, an empirical study by Brignull and Rogers proposed a *public interaction flow model* that presented two concepts, which have become foundational to this doctoral research: public interaction and social affordances. While their studies were conducted in the semi-private settings of party celebrations, the fieldwork conducted in real public space in the context of this doctoral research supports their conclusion, which states:

> For public interaction to become a more acceptable mode of social activity requires the purpose behind it and how it is manifested around and at the display to have strong physical and social affordances, that people can easily and unambiguously pick up on [*sic*]. (Brignull & Rogers, 2003, p. 24)

In Brignull and Rogers (2003), public interaction is enhanced by focusing on ways of reducing social embarrassment, raising awareness and encouraging people to cross different thresholds of engagement (p. 24); this dissertation embraces a less cognitive stance. It does this by attempting to cast a wider net by also including some relational and cultural aspects of interaction with displays. In this sense, it has reached across disciplines to further expand on the HCI definition of human factors.

Brignull and Rogers' (2003) *public interaction flow model* suggests that a public interaction framework is needed to study interaction with digital displays in-the-wild. However, their studies were not conducted in urban space; the two parties that served as the context for their research were indoor academic events. Indeed, many HCI studies on public displays deployed in-the-wild are typically evaluated in semi-public environments under controlled conditions with very specific dependent and independent variables. For instance, Greenberg, Marquadt, Ballendat, Diaz-Marino and Wang's (2011) *proxemics interaction* and Vogel and Balakrishnan's (2004) *spatial interaction* frameworks are display specific, but they are mainly applied to spatial engineering within the closed context of a lab setting. Müller, Alt, Michelis and Schmidt's (2008) *audience funnel* framework makes a significant contribution in addressing design problems in real public space by modeling the different phases of interaction around public displays, but it is actually derived from Brignull and Rogers (2003) and it focuses almost exclusively on audience behavior, not on participation, thus limiting the notion of interaction to a cognitive act of viewing and paying attention (p. 1286). This doctoral research uses an interdisciplinary approach to study human factors beyond the objectivist epistemological assumptions that underpin cognitive science. It does so by drawing from many sources of knowledge to construct analyses that are more concerned with how people relate to one another in contexts where technology, space and culture intersect in-the-wild. Thus, it contributes to the corpus of HCI literature primarily concerned with studying everyday behavioral phenomena around digital public displays with the caveat that here, this doctoral research follows a constructionist approach to the study of human-computer interaction in relation to social factors observed around artistic and cultural artifacts.

Rogers (2011) remarks that doing HCI research "in-the-wild" means "adopting a transdisciplinary mindset – folding, meshing, and extrapolating different concepts,

values, concerns, and findings [*sic*]" (p. 62). She posits that evaluating in-the-wild typically involves putting more emphasis on the duration of a study than on how many participants are needed (p. 58). One of the advantages of this approach is that in-the-wild observations and recordings tend to yield richer data when it comes to understanding how people "appropriate technologies on their own terms and for their own situated purposes" (p. 59). Rogers' argument broadly supports the scope of this doctoral dissertation, which includes such a longitudinal field study of a display artifact.

Within this corpus of HCI research that prototypes interactive screen-based systems – such as architectural-scale digital public displays or media façades – in open urban settings, some raise interesting questions around design by focusing on who is concerned with interactive displays. This issue is closely related to the scope of this doctoral work. Because public display systems are costly, their design and implementation tends to be undertaken by practitioners in university settings, by commercial entities or else by private-public technology partnerships. Accordingly, many HCI researchers mention that this process should consider and accommodate the diverging interests of *all of the stakeholders concerned with their deployment* (Alt, Memarovic, Elhart, Bial, Schmidt, Langheinrich, Harboe, Huang, & Scipioni, 2011; Dalsgaard & Halskov, 2010; Ojala, Valkama, Kukka, Heikkinen, Lindén, Jurmu, Kruger, & Hoslo, 2010).

Who are the stakeholders identified in these studies? They can include a wide variety of actors including academic researchers, public administrators at all three levels of government, advertising firms, commercial partners, non-profit organizations, content production companies, media agencies, technology manufacturers, external service providers and finally, some studies also mention the general public (Ojala et al., 2010, p. 200). The framework proposed by Alt et al. (2011) more broadly refers to them as forming three distinct groups: those who own the space; those who own the content; and those who use the space and the content (p. 261). Gaining ground in HCI research, this approach to urban technology development seeks to deliver optimal value to every category of stakeholders by pragmatically considering the interplay between their respective interests, incentives and value propositions. It is not always clear, however, how the general public's interests and values are being determined and taken into

account. This doctoral research strives to better define the contribution that this latter category of stakeholders can make to the conversation by using an approach that seeks to give significant weight to the input of passive observers and participants.

In the context of *ubicomp* and due to its high costs, urban technology design is largely driven by infrastructural initiatives that involve collaborations between the private and public sector (Dourish & Bell, 2011, pp. 31-43). As a result, the implementation of interactive technologies in-the-wild is a normative enterprise that can be partly driven by market imperatives which tend to commodify the functions of platforms (Greenfield, 2013, pp. 11-13). In fact, this point was indirectly raised by one of the expert designers – a communication scholar - interviewed in the context of this doctoral research. New to the field of interaction design in public space, he admitted that after his first year of practice, he was surprised of the extent to which "multimedia projects and interactive arts are largely financed by advertising; although I knew that this had always been the case for film, television and the press, somehow I had expected it would be different with interactive media" (É. Paquette, interview, 26 August 2013,~11min15sec).

While it is true that digital displays are increasingly becoming ubiquitous in outdoor public space, the full extent of their potential for interactivity remains unrealized as they are still mostly used *to deliver content*. While industry and the public sector are poised to design new systems and applications that could make them more interactive, they have yet to decide *how this will be implemented*. The main problem seems to be, as Paquette and other interviewees remarked, that designers and expert stakeholders cannot help but conceive them as advertising platforms. As has been the case with billboards and public media displays since the nineteenth-century, digital screens typically tend to be used in broadcast mode to publicize commercial content, news and context-relevant information: old habits die hard. As a result, government and industry are still holding off on devising models of what interactive displays could be and do in urban space; while such models are constantly being developed for mobile computing, few explore ways to unleash the interactive potential of displays at the scale of the built environment in-the-wild. What seems clear is that most "stakeholders" are still concerned with commercial profit, not social returns.

Given that technology is the staple through which art and culture are produced and now routinely made available to publics, one can surmise that all this presents a particularly pressing design challenge today, especially in the wake of future cities and their augmented urban spaces. Because of the scope and the stakes involved in large-scale display projects and the public settings they are deployed in, their financing and ownership are inevitably the prerogatives of corporate entities in conjunction with infrastructural partnerships developed between public institutions and private industry. The mission of such infrastructural models is to mobilize both space and time to govern bodies and behaviors; they are *non-places*[1] that regulate movement to facilitate the flow of people, ideas, capital and commodities between cities (Marcus, 2014). Held accountable for rationalizing resources, most infrastructural models are expected to prioritize design and implementation approaches that support profit-based initiatives.

Structurally similar, but practically different infrastructural models have emerged in some major metropolitan centers around the world, with partnerships ostensibly trying to keep private industry from colonizing digital civic infrastructures by either developing them as welcoming public spaces indiscriminately open to everyone at little or no cost, or else by making them available to artists and diverse publics in order that they may use them to experiment with interactive digital artifacts of their own making (Brennan, McQuire, & Martin, 2009; Gibbons & McQuire, 2009; McQuire, Papastergiadis, Vetere, Gibbs, Pedell, & Downs, 2012; Struppek, 2006). Early studies suggest that interactive display technologies deployed in these types of settings may lend themselves better to producing social returns, because their focus on community and culture encourages people to perceive them as distinctively-local shared resources intended for community-building and social, embodied interaction (Bounegru, 2009; Fatah gen Schieck, Schnädelbach, Motta, Behrens, North, Ye, & Kostopoulou, 2014; Yue & Jung, 2011).

Most of these experimentations began under the auspices of the Urban Screen project, although some were later absorbed by it as works-in-progress. In Europe and Australia, the term *Urban Screens* has been used since 2005 to describe an emerging curatorial network that promotes the appropriation of media façades and dynamic digital displays in urban space for the purpose of community-building and artistic creation. In this sense, *Urban Screens* is a movement that firmly pushes back against the

commodification of screen technology in public settings (Struppek, 2006, p. 2). Now known as the *Connected Cities* global network, this initiative has come to support the production of cultural content for screen-based platforms and coordinate exchanges between cities around the world who wish to reclaim public space for art and culture. Of particular interest is that it too, highlights an infrastructural model *but not profit derived*:

> The Urban Screen project was initiated in Amsterdam in 2005 with the conference 'Discovering the Potential of Outdoor Screens for Urban Society'. One of its aims, further explored by the following two Urban Screens events held in Manchester and Melbourne in 2007 and 2008 respectively, was to explore the opportunities of employing the growing infrastructure of large digital displays in public space, currently used mainly as a tool to influence consumer behaviour through advertising, and expand them by displaying cultural and artistic content with the purpose of revitalising public space, and generating public engagement and interaction. (Bounegru, 2009, p. 199)

Here, we begin to see that infrastructures do not always only, as Marcus (2014) claims, "over-regulate people and their actions". They also provide the context for technology design and use. Much of the literature on digital infrastructures makes a nod to the importance of using bottom-up approaches to design by taking into account how people use, and more importantly, creatively appropriate technological systems. In the context of her research on urban sociotechnical infrastructures in major American cities and around the world, Forlano (2006) claims that technologies only become truly sustainable when their designers understand the peculiar ways in which communities of end users make use of them (pp. 51-52). Leigh Star and Bowker (2010) argue that although civic infrastructures shape practices, they can be set up to accommodate changes while providing a uniform standard that allows for global implementation by including design features such as backward compatibility, tailorability, flexibility, more inclusive access and a distributed way of "doing design" that enables and absorbs appropriative practices (p. 154). Pipek and Wolf (2009) similarly posit that the design of infrastructures is significantly improved when computer scientists build pliable systems that can easily incorporate new uses emerging from bottom-up practices (p. 450).

In fact, what the breadth of the literature suggests is that infrastructures are inherently fuzzy; it is perhaps in this way too that they can be characterized as non-places. While they are set up to implement and uphold fixed standards, they also require

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a great deal of flexibility that allow for some degree of experimentation; what an infrastructure supports is by definition, emergent and always evolving. This was certainly the case for the BBC Big Screens and Federation Square, two of the outdoor digital screen infrastructures that were at the heart of the Urban Screen project. Indeed, one of the impetus behind these digital outdoor infrastructures was uncertainty. They came about as improvised projects because, at the time, the resources were there to include screens as components of renovated spaces (Gibbons & McQuire, 2009, p. 140-141; S. McQuire, personal communication, 28 January 2014). As is often the case in innovation leaps, these initiatives can have an *ad hoc* character undertaken as an experiment:

> I think one of the main premise behind having a public screen in Federation Square was that management were simply thinking, "it would be good to have a screen with a big site so that when you have an event, the screen would get used as a part of it; the screen enhances the space and supports the performative aspects of events in Federation Square. ([E5], interview, 4 April 2014,~49min30sec)

One of the expectations behind this approach is that interactive digital public displays can remediate public space to ostensibly produce as many instantiations of the participatory city as there are citizens in modern urban society, an insight anticipated in the literature (McQuire, 2008, pp. 143-159). In keeping with this vision, the underlying assumption of this doctoral research is that what makes the city come to life is human activity, not technology. Technology can structure, enhance, extend and augment one's communicative powers or one's perceptions, but it is civic life that is the pumping heart of a participatory city, and thus, of public interaction. Intimately tied to being together, this proposition echoes Arendt's (1998) theory of action, wherein the public realm of the *polis* is made visible, produced and preserved through interaction and speech (p. 198).

Nonetheless, there remains that those who are involved in the implementation of technology infrastructures are often those who decide what devices and applications will structure those interactions. For this reason, it seems that one of the main challenges in the design of digital public displays does not so much consist in coming to some kind of pragmatic compromise between the views of experts, but to strike a balance between the voices and needs of *all concerned stakeholders* instead. In this sense, design can be construed as an inherently political act. This highlights the importance of developing and

adopting design research approaches that can substantively address this real-life problem. And indeed, some researchers have called for new methodologies that could help effectively close the gap between the top-down prescriptive design guidelines that oversee production and the bottom-up appropriative digital practices that shape *in situ* usages of urban technology (Foth, Agudelo, & Palleis, 2013, p. 727). This doctoral research attempts to take up this challenge by setting out to demonstrate that the HCI ethnographic approach called *multisited design* is a new tool that could be used to shape the design and implementation context of interactive digital public displays. In fact, this is the main contribution of this interdisciplinary research project: *multisited design* is a new approach that has never been applied to the study of interactive digital public displays.

In order to satisfy the objectives of this doctoral research, the central thrust of this work thus had to aim to produce design knowledge on digital public displays by presenting a narrated synthesis of the data obtained from the experts perspectives with that obtained from end users. The hope was that from this, design knowledge would emerge to answer the overarching question: *how can design support new forms of interaction and participation with digital public displays?* Given that ethnography was the methodology applied to this end, it would involve participant observation, fieldwork and the writing of interpretive, narrative texts that were open-ended and speculative in nature. This, in turn, would imply that this knowledge could neither be validated, nor generalized; it does not claim to posit a single truth about the world and it does not strive for accuracy. Ethnographies are rhetorical forms that seek to construct the object of inquiry by means of description. Thus, although this doctoral work has been conducted within the field of HCI, it firmly pushes its disciplinary boundaries because it envisages that there are, and should be, alternative ways of doing HCI research. For instance, this dissertation does not include a chapter that expounds a comprehensive literature review. Instead, references to previous studies and theories are weaved right into the narrative.

This is no heresy. On this issue, Dourish (2006) wrote, "ethnographic analysis must reflect a set of analytic commitments, and indeed it is the working out of these analytic considerations that is the work of the ethnography" (p. 544). This dissertation builds on Dourish's work. It is for this reason that it is neither linear, nor is it unidimensional. Because its object of study is multi-dimensional, so are its analytical

commitments. An interpretive outcome of participant observation, it reports on field observations made over two years, presented as a narrative punctuated with analyses on design research. By focusing its lens on the public vocation of digital public displays, it aims to contribute to the literature in several ways; first, by implicitly developing the concept of real time public interaction in-the-wild; second, by introducing a framework of social affordances tailored to this context; third, by presenting thick descriptions that suggest four purposes for interactive screen technology that could be deployed in cities of the future; and finally, more significantly, by applying for the first time the multisited design approach to the study of interactive technologies deployed in public space.

To achieve this, this doctoral dissertation was structured as follows. Chapter Two offers a detailed description of the research methodology used to collect, interpret and report the empirical data. It begins by illustrating the scaffolded research model on which rested the research plan of action and outlines each research phase. It then expounds the multisited design approach and describes how it was applied in the context of this empirical study of digital public displays. It explains how the data was collected during each phase. And finally, it exposes the theoretical foundations of the public interaction framework that was conceived as a *tool to think with* in preparation for fieldwork.

Chapter Three weaves a narrative that presents the data, analyses and results of the first field evaluation conducted in the district that served as the terrain for this doctoral multisited fieldwork: a permanent outdoor one square-kilometer infrastructure of nine digital media façades called the Quartier des Spectacles in Montréal, Québec. This chapter begins by introducing this site and situating it within a global context. It then presents the extant theory that illuminates the research results that follow. The latter include examples of practice observed in the context of urban digital art festivals that provided grounded contexts for public interaction in-the-wild. Finally, this chapter traces the arc of the trajectory that sees the shift from non-participant to participant observer, an arc that led to expert stakeholders extending their invitation to do the second field evaluation, which constitutes the subject of Chapters Four, Five and Six.

The detailed analyses expounded in these next three chapters is another significant contribution of this dissertation to the field of HCI: they provide further

validation of previous findings in this area of research and extends them by reporting on specific instances of how people used an interactive public display in-the-wild. Chapter Four presents the data, analyses and results of the first part of the second field evaluation conducted on one of the Quartier des Spectacles' nine media façades. It describes a deeper immersion in the field by way of the study of a single interactive display artifact called Mégaphone. This chapter first describes it in detail. It then focuses on data collected from the perspective of the expert stakeholders before the deployment and weaves in some of their *post mortem* reflections on design issues. Finally, it identifies some of the challenges that came up, including the existence of a disjuncture between experts and end users by closing on feedback collected from study participants.

This interview data segues into Chapters Five and Six, which report on the second part of the second field evaluation. These chapters present and discuss the field findings of the Mégaphone case study by focusing almost exclusively on the perspective of end users in conjunction with direct field observations. Both these chapters adopt a narrative mode in which extant theory is cited throughout to explain findings, but here, the research design structures the presentation of the empirical data: Chapter Five identifies and describes the social affordances that were observed during the baseline use of Mégaphone, while Chapter Six analyzes how participants appropriated Mégaphone above and beyond this baseline use. In particular, Chapter Six reports on four examples of appropriative practice that extended to online interactions. In doing so, it suggests four possible purposes for digital public display systems that emerged from the creative interpretation of field observations. This chapter ends with an example of practice that demonstrates how participant observation is a research method that can be used to stage and frame the appropriation of technology in real-world environments.

In conclusion, Chapter Seven summarizes this doctoral research by highlighting its most important points and take-aways. It identifies some of the limitations in this empirical work, addresses methodological challenges and opportunities in HCI and proposes some new avenues for research. It also suggests that considering the design knowledge produced by a situated ethnographic study of interactive displays in public space may provide indirect, but useful insights for the planning of future cities and urban digital infrastructures, a claim supported by Dourish and Bell (2011) who argue that

because the impact of such analyses are more diffuse and non-generalizable, they may provide new ways of imagining the relationship between people and technology by blurring the line between designer and user, and thus, technology and practice (p. 86).

Chapter 2.

Methodological Approach

A space for thinking of our methods as though they were technologies encountered in the field, but also for thinking of technologies encountered in the field as though they were "anthropological" methods for apprehending social cultural phenomena because they often are. (Nicholas Seaver qtd in Marcus, 2014)

In their canonical collection of essays titled, *Writing culture: The poetics and politics of ethnography: A School of American Research Advanced Seminar*, Clifford and Marcus (1986) write: "ethnography is an emergent interdisciplinary phenomenon [whose] authority and rhetoric have spread to many fields" (p. 3). The interdisciplinary vocation of this research method is hardly surprising if we consider that, as Tyler (1986) remarks, it is etymologically related to the writing and representation (-*graphy*) of the study of peoples and cultures (*ethno-*); differently put, it is directly related to the source of knowledge production itself (p. 122). It is perhaps for this reason that ethnography has been widely applied as an interdisciplinary research method, not only in sociology, but also in many disciplines including human-computer interaction. HCI approaches that have adopted ethnographic methods include the *situated action approach* (Suchman, 1987), *ethnomethodology and technomethodology* (Button & Dourish, 1996) and *multisited design ethnography* (Williams, Lindtner, Anderson, & Dourish, 2014). All these approaches take root in the field of cultural anthropology (Rogers, 2004, p. 115).

Perhaps this partially explains why, as Dourish (2006) has argued, ethnographic modes of enquiry do not naturally align with the objectives and expected outcomes of HCI research (p. 544). This issue became especially apparent in the context of this doctoral program of research. From the outset, its object of study and research objectives were too complex to be reduced to a series of hypotheses and experiments around human factors conducted in the artificial and highly-managed setting of a HCI

research lab. As a rule, public interaction with dynamic digital displays unwittingly occurs in-the-wild under uncontrollable conditions. True, one could set parameters and assign variables to study behavior in urban space. But such a deductive research design seems more appropriate when the design problems are already well known. This was not the case here for it is only recently that this object of study has been studied in-the-wild; Rogers (2011) situates this shift in design thinking in the last decade (p. 58). For this reason, it seemed more fitting to select an approach that consisted in inductively teasing out empirical data with which theory could be generated to further validate and identify human factors that may cause specific effects, for as Rogers remarks, in-the-wild studies that foreground end users may better mirror real-world environments, hence "demonstrating quite different results from those arising out of lab studies" (p. 59).

Moreover, an interdisciplinary approach was adopted to also include cultural practices and infrastructural developments as additional topics of ethnographic inquiry. By doing so, this doctoral work would attempt to contribute to in-the-wild studies on interactive digital displays by reaching across disciplines to gain and carve out an understanding of an emerging area of research that is complex because its roots extend from radically different fields, cut off from one another and traditionally associated with distinct research traditions. These different disciplines would overlap and converge in the ethnographic text itself. In cultural anthropology, such an approach is supported by Clifford and Marcus (1986), who refer to Barthes' writings on interdisciplinarity (p. 1):

> Interdisciplinary work, so much discussed these days, is not about confronting already constituted disciplines (none of which, in fact, is willing to let itself go). To do something interdisciplinary, it is not enough to choose a "subject" (a theme) and gather around it two or three sciences. Interdisciplinarity consists in creating a new object that belongs to no one. I believe the text itself to be one of those objects. (Barthes, 1972, p. 3)

2.1. Adopting a Constructionist Epistemology in HCI

HCI design research is different than most research traditions in that, like the fine arts, it is either practice-based, or else it usually involves the theoretical study of a practical component in some form or other. However, to qualify as research, design

cannot only be about *making*. It must draw on theory as the "development, articulation and communication of design knowledge" (Cross, 1999, p. 5). Furthermore, as Feast and Melles (2010) point out, design research cannot simply be "concerned with speculations regarding the relationship of theory and practice". It must also engage in reflections on how this knowledge is produced (p. 1). It is in this sense that ethnographic approaches can be useful in design research. As Dourish (2006) remarks, *the ethnographic text is the final research outcome*; although its analytical component can legitimately make theoretical claims, it is in fact a conceptual space to reflect on issues of technology design and use raised during a series of ethnographic encounters (p. 543).

The fact that HCI tends to draw from different disciplines, however, presents a significant challenge because it confronts the researcher with a problem that is epistemological at its core. Feast and Melles (2010) suggest that design research can be generated under three distinct epistemological paradigms – that is, theories of knowledge that define what kind of knowledge is possible and legitimate. These are Objectivism, Constructionism[2] and Subjectivism (pp. 2-3). Each comes with "assumptions about human knowledge and assumptions about realities encountered in our human world", which shape the research questions, the methodology, and of course, the outcome (p. 17). Here, the implication is that the research process is inevitably framed by the way these assumptions represent the world and its objects (or subjects).

With regard to this doctoral research, the problem this raised could be formulated as follows: identifying key issues around the design and use of interactive display technology in public space implies either having to simultaneously draw from three distinct research traditions, namely, science and technology, humanities and the fine arts, and the social sciences, or else having to choose between them. For, in order to have a comprehensive understanding of this research problem, one must take into account people *and* the nuts and bolts of design. The fundamental problem with embracing several research traditions at once is that although, they may overlap at times, in modernity, they have each come to be underpinned by different epistemological paradigms. In this sense, they can be said to be inimical. For instance, science and technology research usually relies on the objectivist epistemology, the fine arts and humanities have traditionally been the preserve of Subjectivism and the branch of

philosophy called aesthetics, and lastly, the social sciences tend to be largely influenced by the constructionist epistemology – with this trend seemingly increasing with the years.

If we admit that all three research traditions are typically associated with a different set of assumptions about how knowledge is produced, then, of necessity, a choice should be made. Otherwise, the research would be flawed in the sense that it would not rest on a coherent system of knowledge. The *post hoc* review of the HCI literature carried out in the context of this doctoral research provided good examples of such epistemological disjuncture. In many studies, research that had originally been carried out with a constructionist mode of knowledge production was presented under objectivist assumptions. Indeed, this is a problem that Dourish (2006) has extensively discussed in reference to the use of ethnographic research methods in HCI (p. 547).

Typically, practitioners work within one research tradition throughout their career, steadily embracing the same assumptions about how we know what we know and the nature of reality. They build a lifetime's work on a well-defined and mastered set of axiomatic truths. However, the interdisciplinary nature of HCI problematizes the study of digital public displays and the referencing of its extant literature because it seems to be constantly straddling two incongruous epistemological paradigms. Spanning far and wide, well beyond technical know-how about handles and knobs, this corpus of research has been produced under entirely different sets of assumptions: either Objectivist *or* Constructionist ones. There can be no "*and*" here. Yet, this problem is seldom raised. Instead, there seems to be prevailing expectations that Constructionism can yield Positivistic results, as Dourish (2006) notes with what he calls the "implications for design" criteria by which ethnographic practice is evaluated in HCI (pp. 541-542).[3]

This may explain why becoming familiar with some of the main theoretical perspectives that have informed this domain of design research can often feel like one is venturing onto thin ice. If we take technology, space and culture as the three theoretical pillars of knowledge for the study of digital public displays and media façades, we can predict where the ice formation gets weaker and threatens to crack. Technology and space are both concepts that are most often understood as having a material basis: the former as a physical artifact and the latter as a geographically circumscribed place. But

while the products of culture are often tangible artifacts, culture itself is not. Culture is immaterial. Thus, technology, space and culture are seldom studied under the same lens. This is especially obvious in HCI research wherein the first two tend to gravitate toward the material realm, while the third ostensibly manifests in the conceptual realm.

In HCI, technology and space are most often studied under the Objectivist epistemology (concerned with investigating the existence of an objective reality through its manifestations in the material realm), while culture has hardly lent itself well to the scientific method of knowledge, Objectivism's main strategy to produce knowledge. Instead, cultural phenomena are better explained by the Constructionist epistemology, which supports the idea that process and experience can be objects of study. For even though culture is in fact often studied in its material expression – artifacts, media, performances, etc. – it is substantially made up of a social understandings better illuminated by theoretical perspectives that focus on meaning, values and actions.

It is this that aligns with the research objectives of the work undertaken in this doctoral program: producing design knowledge around interactive digital public displays *from the exchange of meaning between stakeholders*. It was a cooperative enterprise which sought *to discover design knowledge collaboratively*. This stance is unmistakingly constructionist. This is the first avowal about this work; the rest then follows from this.

Crotty (1998) defines an *epistemology* as a set of assumptions about the nature of knowledge and how it is produced; a *theoretical perspective* as a philosophical stance that provides a context for research; and a *methodology* and *research methods* as, respectively, the strategies and tools the practitioner engages with to produce research knowledge (p. 3). He argues that, like matryoshka dolls, the assumptions of a set of research methods, of a methodology, of a theoretical perspective and of an epistemology must neatly nest inside one another in that order. This research model is meant to provide researchers with the foundation upon which they can build and deconstruct research knowledge: they can produce it, while remaining critical of its strengths and weaknesses. Setting forth this structural aspect of the methodological approach helps to provide a clearer understanding of the ways in which design research

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can be a normative process and allows practitioners to defend their research and thus think more critically within their discipline or as interdisciplinary scholars.

2.1.1.   Establishing the Research Model

It is in light of this logic that Crotty (1998) proposes a scaffolded research model, which can provide an initial framework to guide scientific inquiry (p. 1). It comprises four distinct levels nested in the following order: research methods, methodology, theoretical perspective and epistemology. An example of a scaffolded research model that illustrates the relationship between these four conceptual levels is shown in Figure 2.1. It describes a study conducted in the scientific method under the Objectivist epistemological paradigm, which would rely on positivistic theory, use survey research as a methodology and apply statistical analysis as the tool to collect and interpret data (Crotty, 1998, p. 6). Here, statistical analysis is the research activity carried out according to the research plan of action laid out in the survey research methodology, which in turn is a strategy defined by a positivist philosophical stance, which itself is informed by an Objectivist world view (pp. 2-3).

Arrows are drawn in both a downward and an upward direction: they are double-sided. This means that one must be able to make sense of this model in both directions. The epistemological paradigm that underpins the research process is placed at the top of the pyramid since everything that follows below is necessarily derived from it. However, a research project – especially in inductive approaches – typically starts with a real life problem that a methodology or a set of research methods can actually address (p. 13). This means that a researcher might begin thinking about the model shown in Figure 2.1 from the bottom up if statistical analysis presents itself as an obvious way of answering a question about characterizing the behavior of a population sample. What is important in this model is that each level must be in agreement with the levels above it and below it in order that the research design soundly rests on solid ground. The speculative nature of inductive research makes this model especially useful in explaining the high level concepts derived from the more practical aspects of the research design.

What's more, when research is broad in scope, this scaffolded model provides a litmus test to individually fashion every smaller study that then becomes an offshoot of the overall project. Because the starting point of such an enterprise is likely the research objective(s) and question(s), Crotty (1998) recommends that practitioners tailor their scaffolded research model around these (p. 13). Before the empirical work began, the original objective of this doctoral program stated on pages 1 and 2 was to develop, in the context of design research in interactive art and technology, "a more participatory model that would facilitate new forms of social, cultural and political interaction", while the research question was: "what happens when digital public displays enable a two-way flow of interactions instead of a one-way mode of information delivery?"

To study this real life issue, a constructionist epistemology was chosen over an objectivist one because the goal was to obtain research results that would take into account the design concerns and effects of as many people as possible, while the design knowledge itself would emerge from an interpretation of the dialectical interplay between the end users' testimonies compared against the experts' perspectives – and what is meant by experts, here, includes the designers, the producers, the research community and industry professionals. This implies that the findings needed to reflect both the agreements and the disagreements of these stakeholders' subjective views. Altogether, these would be interwoven and synthesized. To summarize, design knowledge was to be co-created by those involved in the making *and* use of displays.

Given that producing this design knowledge meant including different perspectives, semi-structured interviews conducted with as many stakeholders as possible presented itself as the most pertinent method of collecting data. Adopting a constructionist stance to interviewing implies that all voices are given equal value because they are each to be construed as valid truth claims. But in order for the design knowledge to be co-created, the methodology itself has to support a process of collaboration. Ethnographic inquiry offers this context as it positions the researcher as an observer who "becomes involved in other people's projects, [whereby] collaboration becomes the ether of the ethnographic research" (Marcus, 2014). Ethnography also foregrounds participant observation, a research method which requires that the investigator become immersed in the field (Spradley, 1980, p. 3). One advantage of this

is that it makes it possible to become more familiar and closely involved with the interviewees by sharing some of their experiences. Ethnography was therefore the methodology of choice from the beginning of this doctoral research program as it offered a means to collect, interpret and translate a multiplicity of voices into design knowledge.

As noted in the beginning of this chapter, many HCI approaches rely on ethnography. However, one stood out as most relevant to this doctoral program. This is the multi-sited approach applied to the study of sociotechnical systems. My first training in this methodology was during a workshop called "Ethnographies of Large Sociotechnical Systems," given by Dr. David Ribes (Georgetown University) and Dr. Janet Vertesi (Princeton University) at the University of Maryland's Human-Computer Interaction Lab (HCIL) in College Park on July 30, 2013. I developed a deeper understanding of this approach when eight months later, I participated in a masterclass with Dr. George Marcus (University of California in Los Angeles) called, "The relevance of ethnographic inquiry today: Is it still small? Beautiful? Critical? Possible?" at the University of Melbourne, in Australia, on March 20, 2014.

Marcus (1986) is the cultural anthropologist who originally laid out the foundations of the constructivist theoretical perspective called "multi-sited ethnography". In the 1980s and 1990s, ethnographers had been experimenting with methods to examine large-scale and long-term phenomena. Marcus was not the first scholar to apply a multi-sited approach to study culture and its artifacts, but he was the first to have published a paper that expounded the methodology and some of the different ways it had been, and could be, applied to interdisciplinary scholarly research (Marcus, 1995).

It is not uncommon to refer to the multi-sited approach with the axiom: "…follow the people, follow the thing, follow the metaphor, follow the plot, follow the story, follow the allegory, follow the life and follow the conflict across sites..." (Marcus, 1995, pp. 105-110). The question here is can this apply to HCI design research? According to Moran:

> The term 'design' has different meanings, and these are useful to consider: I take the position that design is a complex concept that is not limited to a particular role in the development process. Rather it is a set of distributed activities of different kinds by different people at different points in the life cycle of interactive systems... (Moran, 2002, p. 15)

Although Moran's (2002) statement specifically refers to "everyday adaptive design", it supports the view that HCI design is a collective process, which happens over time in many stages and many sites. Accordingly, design as a process, as knowledge and as an outcome *can be a thread that is followed across multiple sites*. Indeed, the objectives and the research question of this doctoral work are underpinned by this idea that design knowledge of digital public displays can be constructed collaboratively to produce more participatory models. Further, in 2014, Williams, Lindtner, Anderson and Dourish introduced their *multisited design* approach to the field of HCI (p. 80-82).

But how can HCI design be multi-sited? To answer this last question, one must turn to the experts that first coined the term "multisited design" and pioneered the eponymous methodology over the past decade. The first mention of the use of multi-sited ethnography in HCI research appears to be in Dourish (2006) but it is merely a side-note used to critique "scenic fieldwork" (pp. 544, 548). Four years later, in 2010, two major papers were published on *postcolonial computing* (Irani, Vertesi, Dourish, Kavita, & Grinter, 2010) and *transnational practices* in HCI (Shklovski, Lindtner, Vertesi, & Dourish, 2010). Both these papers aim to situate local design practices within a global economy. It is only the following year that researchers present a five-page position paper intended for a CHI workshop that uses, and explains, the term "multisited design" to describe how "technologies are appropriated into local cultures and yet shaped by transnational politics and negotiations" (Lindtner, Anderson, & Dourish, 2011, p. 1):

> Our framework draws attention to, first, the multiple yet heterogeneous sites of design practice and, second, the role of interactive technologies as a resource for people to imagine identity and cultural belonging, across cultural and regional borders. (Lindtner, Anderson, & Dourish, 2011, p. 1)

There follows suit, a few other papers that mention the multi-sited approach applied to HCI (Lindtner, Anderson, & Dourish, 2012; Rotman, Preece, He, & Druin, 2012), until finally, in 2014, a journal article fully expounded this new HCI methodology. Here, Williams, Lindtner, Anderson and Dourish (2014) proposed that the term "multisited design" be used to describe "an iterative process of engagement in the field, analysis, return to the field, and so forth" when the field is defined as multiple and heterogeneous sites of design practice and use of interactive technologies that transcends cultural and regional borders (p. 81). The underlying argument of this essay,

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and of the conceptual approach it advocates, is that the contemporary transnational character of everyday life presents new challenges for scientific enquiry, and thus new approaches must take into account the fact that discourse and actions are now played out and politicized on a global stage; it places an "analytical focus on design and material production, as they occur in diverse and distributed settings" in order to "help us both make sense of transnational technological interactions and foster productive collaborations between the disciplinary practices of ethnography and design" (p. 79).

Multisited design thus presents itself as an interdisciplinary approach that is constructionist in nature yet endogenous to HCI. Given that, as Moran (2002) remarked, design knowledge is produced by many people in many places, and given the fact that technology design and use are globally interconnected in today's world, the multisited design approach supported the research agenda of this doctoral work. Indeed, by legitimizing participant observation and collaborative methodologies as key design research practices, it *provided a context for the process* of getting involved in the making of a display-based interactive artifact, investigating many digital display sites in public space and interviewing a great diversity of concerned stakeholders. Accordingly, it was chosen as the theoretical perspective that would underpin this doctoral research project.

Here, the thread that is followed is how design knowledge is constructed through different sites of representation, which can take the form of artifacts, places, people, interventions and metaphors. Figure 2.2 shows the scaffolded research model of this doctoral work. The methodology that has been used throughout is ethnography, a research strategy that aims to describe and interpret – but as Crotty (1998) points out – is increasingly used to expose unbalanced power relationships in order to open up more fluid channels of communication between stakeholders (p. 12). This helps to attend the research goal of having expert designers better understand the real needs and perspectives of end users in public space. Here, participant observation was used to conduct the ethnographic inquiries informed by a constructionist epistemology that supports the co-creation of design knowledge. The research design for each individual study that came out of this doctoral research project was grounded in the logic of this scaffolded model, but the multisited approach provided the map for the plan of action.

2.2. Multisited Design[4]

As an emerging HCI constructionist methodology, multisited design combines two approaches: first, the practice of multi-sited ethnography as theorized by Marcus (1995), and second, the tradition of participatory design that originated in Scandinavia (Bjerknes & Kyng, 1987). Figure 2.3 illustrates the relationship between multi-sited ethnography, participatory design and participatory development as the three pillar approaches on which rests multisited design; it also highlights the common denominators between them: the use of participant observation and collaboration with informants and stakeholders. The following subsections discuss these, while placing a greater emphasis on multi-sited ethnography because it carries more weight in this work.

2.2.1. Multi-Sited Ethnography

Multi-sited ethnography is an interdisciplinary critical approach conducted in multiple, distributed and shifting (micro) locales to later be analyzed against the contours of these sites' overarching (macro) context (Clifford & Marcus, 1986, p. 175). While traditional ethnography typically sees one or sometimes several ethnographers describe a single, well-circumscribed site, in a multi-sited approach, one or more researchers can be sent to observe each of the fields in which stakeholders might play a role in the creation, production, distribution and reception of a social or sociotechnical structure.

Practically speaking, this means that fieldwork is conducted in a distributed environment made up of multiple sites. By moving in and out of these sites, the ethnographer can come to know the actors, customs, routines, practices and idiosyncrasies tied to each one of the locales. This means that rather than studying a single location as the product of global phenomena, in a multi-sited approach:

> The researcher travels to multiple sites, following various pathways in order to assemble a narrative [which] is intended not to give the ethnographer more cases…but to expand a single case beyond its immediate location. (Geiger & Ribes, 2011, p. 3)

By documenting observations, reviewing them, culling them and drawing them together, one can get a sense of how an overall sociotechnical structure functions.

Because the mode of construction is to follow a single thread across multiple sites, multi-sited ethnography ostensibly produces "a distinctly different sense of 'doing research'." (Marcus, 1995, pp. 112-113). In addition, Marcus (2014) claims that multi-sited research today has a new alignment, which involves staging one's research for micro-publics in each site. What moves the investigator from one site to another is now the presentation of research outcomes to these micro-publics. In fact, this is one of the ways in which multi-sitedness is collaborative. The ethnographer acts "not as a consultant, not as an expert, not as a member of the stakeholder group, but as a feedback loop".

Marcus (2014) also argues that this shift in thinking has extended our understanding of what a site can be. What constitutes a site in field work has long been contested in the field of anthropology. Multi-sited ethnography has further problematized this. The cultural anthropologist claims that in contemporary practices of ethnography, "the field seems to be more disembodied…the literal place where something is happening is not necessarily the real site, for in fact, the site is now *in the design* of this place [emphasis added]". It is for this reason that Marcus (1995) suggests that today, the modes of construction of one or more sites can mean to "follow the people, follow the thing, follow the metaphor, follow the plot, follow the story, follow the allegory, follow the life, follow the biography and follow the conflict across sites" (pp. 105-110). Accordingly, a site need not be limited to being an actual geographical location. As Ribes and Vertesi (2013) remark, sites can now be physical, virtual or imagined. While ethnographers have always crafted their sites and their boundaries subjectively, in a multi-sited approach, sites are not necessarily to be literally construed as physical emplacements. Some ethnographers construct them metaphorically by defining them more broadly as "sources of knowledge". As Marcus (1995) writes:

> Multi-sited ethnographies define their objects of study through several different modes or techniques. These techniques might be understood as practices of construction through (preplanned or opportunistic) movement and of tracing within different settings of a complex cultural phenomenon given an initial, baseline conceptual identity that turns out to be contingent and malleable as one traces it. (p.106)

As Tyler (1986) remarks, *in lieu* of providing scientific insights or political understandings, ethnography is a form of writing that engages in a process of

negotiating and renewing ethical visions of the world (p. 122). Ethnographers achieve this by using three rhetorical strategies: *descriptive* (by presenting subjective observations on people and cultures), *interpretive* (by highlighting the relationships between these observations), and *reflexive* (by exposing the constructed nature of the relationship between the observer and the observed). The ethnographic text serves as the canvas for a subjective reflection on culture, but it is also often a work that stands on its own as an article, a literary work, an illustrated catalogue, a collection of photographs, a video or an installation; it has the dual status of research outcome and cultural text.

As such, it can go beyond describing, interpreting and reflecting on a given understanding of culture to provide valuable knowledge on the material practices of HCI design. *It can itself become the site where meaning is negotiated.* This was often the case during this doctoral research: I shared my study results with concerned stakeholders who then, either gave feedback, or else used the design knowledge to plan future designs, interventions or strategic plans. In fact, most stakeholders expressed the desire to read the reports that related to their engagement in design. As Marcus (1995) argues, this way of using collaborative methods can lead the ethnographer to become a "circumstantial activist" whereby the process of doing research fosters encounters, frictions and flows between all stakeholders involved (pp. 114-115). It is also the occasion for creating micro-publics outside the academy (Marcus, 2014).

Marcus (2014) remarks that in today's practice of multi-sited ethnography, fieldwork generates its own outcomes by transforming relationships with project collaborators and the field itself, and it is in this sense, that it is rooted in the local: "what it means and what it comes to mean is uncertain [but] what it legitimates is a systematic personal form of inquiry". However, the multi-sited approach also has a global dimension because cultural meanings, objects and identities can "no longer easily be located in a world system perspective": imaginings are now global (Marcus, 1995, p. 98).

2.2.2.   Participatory Design and Participatory Development

The second and third sections of the backbone of multisited design is Participatory Design (PD) and Participatory Development. PD is a set of methods used

in HCI to engage people within a workplace, organization or community of practice in order to participate in the design of the computer systems they use in the everyday, while the related approach of Participatory Development broadly aims to "involve local stakeholders in development projects", notably in developing regions or countries (Williams, Lindtner, Anderson, & Dourish, 2014, pp. 82-83).

Perhaps these two distinct approaches point to what some authors refer to as a "drift in focus from participation as the means to a political agenda to participation as a means to a smooth development and implementation, or sometimes as an end in itself" (Bergvall-Kåreborn & Ståhlbrost, 2008, p. 102). What they have in common, however, is that they are both inherently about the politics of design. The issue of *who participates in the design process* is at the core of these two approaches. This is also at the core of this doctoral research project: how can experts and end users better design together?

Collaborative approaches are intrinsic to anthropology. Collaborative ethnography, for instance, aims to go beyond the solipsistic bias of participant observation (Rappaport, 2008, p. 2), while participant-generated ethnography takes a pragmatic stance towards the problem of gathering data in large-scale systems by actively involving informants (Geiger & Ribes, 2011, p. 3). As a result, many ethnographers studying technology share a similar set of concerns as HCI designers using Participatory Design or Participatory Development because ethnography assumes that collaboration is a deeply political process (Marcus, 2014).

2.2.3.   Applications of Multisited Design

Williams, Lindtner, Anderson and Dourish (2014) combined participatory approaches and multi-sited ethnography to the study of the design and implementation of complex objects of study in HCI "maker culture". For instance, Williams is a "tinkerer" who applied a multisited design approach to the making of an interactive customizable desk lamp she calls *Clyde*. She did this by building ARDUINO™ boards with a Chinese maker community in a hackerspace in Shenzhen while she was studying under Dourish at UCLA, and starting to set up her design studio with business partner, Bruno Nadeau, in Montréal. Accordingly, their article reflects on how this way of doing HCI design

across multiple transnational sites of knowledge can connect the local to the global and thus restructure power relationships between those involved in the design process.

In fact, Williams' multisited approach includes three physical sites: a hackerspace in Shenzhen, her design studio at UCLA and her studio in Montreal. What connects these three sites of representation is the practice of design. While in some cases, the sites may be multiply situated in terms of their geographical locations, in other cases, their multi-dimensionality may be manifest in how they assemble physical, virtual and imagined sites of representation (Williams, Lindtner, Anderson, & Dourish, 2014, p. 84). This last reason is why this emergent methodology has proven to be a suitable plan of action for this doctoral research. Multisited design allowed for the construction of the research field as its own network of sites. Moreover, because this constellation of sites can include physical, virtual and imagined sites of representation, it ostensibly offers the possibility for a deeper level of engagement to study phenomena in hybrid spaces.

Practically, this means being able to relate and simultaneously explain phenomena that occur within the new experiences of time and space enabled by connectivity and human-computer interaction. Whether events take place in real time or asynchronously, and whether they are situated in the hyperlocal or are mobile in global networks, multisited design offers ethnographers new tools to describe and interpret. The extant literature argues in favor of making the act of design part of the investigation:

> We attempt to build a multisited analytical framing in which design is central to both our research method and analysis, with a commitment to positioning design and ethnographic writing purposefully against exoticization or center-periphery binaries and toward empathetic connection. (Williams, Lindtner, Anderson, & Dourish, 2014, p. 85)

However, there is much room to experiment with what form such an engagement can take. To reflect on this, Chapter Six will conclude on a thick description of how participant observation and immersion in the field led me as an investigator to become actively involved in creative appropriation by eliciting a specific purpose for an interactive digital public display called Mégaphone. Perhaps more than any other observation made during this doctoral field work, this example shows that for participant observation to have value as research, it must be reported in the form of an ethnographic text. In this

doctoral research, the ethnography is this dissertation, which includes a literary description, but also material as diverse as interview transcripts, and photographs taken in the field or shared by stakeholders who collaborated in this research project. But this doctoral research also produced *ethnographies* that took the form of shorter articles and videos – again, sometimes written and produced in collaboration with stakeholders – and presented in local, national and international conference venues. These are exhaustively listed in Appendix K.

Figure 2.4 describes how each phase of this doctoral research involved writing and producing such reports that served, on the one hand, as opportunities to collaborate with stakeholders in generating and disseminating design knowledge, and on the other hand, as a feedback loop to motivate their engagement with this knowledge. It is noteworthy that the first reports were instrumental in building trust with the stakeholders who, as a result, invited me to become more deeply involved in the field by collaborating with them in conducting a 37-day qualitative evaluation of their interactive display artifact. This is literally what Marcus (2014) means by how "staging one's research for micro-publics in each site…moves the investigator from one site to another".

The diagram in Figure 2.4 also shows a timeline that charts the variations in the scope of the observations throughout the research process. It supports Spradley's (1980) claim that, "participant observation begins with wide-focused *descriptive observations*. Although these continue until the end of the field project…the emphasis shifts first to *focused observations* and later to *selective observations* [*sic*]" (p. 34). The progression of this doctoral research process saw, at first, an emphasis on interactive public displays in general; then, more narrowly on their design and the context in which they are produced; and finally, on how people appropriate them regardless of the designers' intentions. Chapters Three, Four, Five and Six report on each of these phases by focusing the research lens on the core site, the experts and the end users respectively.

Figure 2.4 also suggests that producing ethnographies with multisited design not only affords researchers the flexibility to follow an object of study that is complex in scale, multi-dimensional, shifting and multiply situated, but also to "pull things out of a

cloth by observing, collaborating and reporting" over time across sites (Marcus, 2014). The next section looks at how field data was collected, interpreted and reported.

2.2.4.   Data Collection

In accordance with the scaffolded research model shown in Figure 2.2, this empirical research was conducted using inductive research methods. This included producing field documentation of human behavior and interactive artifacts onsite by taking hand-written notes, photographs and video recordings. It also meant conducting short, unstructured onsite interviews with participants, or else longer semi-structured interviews with participants and experts such as designers, computer scientists, technicians, producers and those authorities involved in the planning and maintenance of display infrastructures. Finally, third-party primary source material such as open archives, internal documents, public records and webpages were consulted.

This process was undertaken for three reasons. First, it arguably allows the investigator to produce a more holistic, albeit subjective, view of the real-world sites under study. Second, it is ostensibly better adapted to HCI research in the sense that, although it is constructionist in nature, it draws from a wider array of perspectives and sources to give presence to a multiplicity of voices in the ethnographic report. Third, it allowed the analyses and interpretations to emerge from triangulation between three distinct sets of data collected iteratively across multiple sites and in several phases of the doctoral research. Figure 2.5 illustrates this method of analysis. It is inspired and derived from Spradley's (1980) ethnographic research cycle diagram, which suggests that "the ethnographer tends to follow a cyclical pattern…[ethnography] seldom fits a linear model; instead, the major tasks follow a kind of cyclical pattern, repeated over and over again [*sic*]" (pp. 26-29). Figure 2.5 shows that data collection occurred *in a continuum*, whereby each iteration worked toward enlarging the scope of the research.

While Figure 2.4 shows that this multi-sited doctoral research was born in different phases which saw the principal investigator's role gradually shift from non-participant observer to participant observer, Figure 2.5 suggests the cycles of data collection and analysis that moved the engagement from one stage to another. The

ethnographic text that spans from Chapters Three to Six describes this trajectory as a narrative punctuated with analyses. Such a journey is part and parcel of ethnographic work, and as such, it forms the backbone of this dissertation and raises the question: what are the possible links between HCI design research and participant observation? This may well be a question that might open up new avenues for research?

Data Collection During Phase One

As Spradley (1980) remarks, ethnographic work is unlike the task of other forms of inquiry in the social sciences for although the ethnographer may start with a general research problem, they do not have a clear idea of what they need to find and they do not know what they are looking for; they are like the "explorer trying to map a wilderness area"; and indeed, phase one of the field work was an occasion to "describe the cultural terrain" and start to gather information in order to begin its exploration (p. 26).

In 2012, during phase one, I made field observations and initiated a process of building bridges by contacting different stakeholders. This led to a series of semi-structured interviews with artists and experts, who then gave me access to third-party primary source material (including audio-visual documents) that described the interactive artifacts and more importantly, the display infrastructure that soon became the physical site under study. As a result, the data collected during phase one already included the three sets of data shown in Figure 2.5. However, given the exploratory nature of phase one, triangulating between these sets of data led to an analysis that resembles less an ethnography, and more an exercise in reverse-engineering in that the interpretation attempts to explain the workings of public interaction through aspects of interface design (Enns, 2004, pp. 39-40). Consequently, in phase one, research results were formulated as abstractions that suggest broad considerations to help practitioners reflect on design aspects of a framework for public interaction. They are presented as a narrative that might help identify possible HCI design trends; the fact that results were obtained in-the-wild also might work to support study findings obtained in more controlled conditions.

Data Collection During Phase Two

Phase one was a process of becoming familiar with different actors within the collaborative partnership who ran the display infrastructure in which I had conducted my

field work. Early in 2013, some of these actors asked me to conduct a ten week field evaluation of an architectural-scale interactive display system called Mégaphone that was to be designed and deployed in downtown Montréal that autumn. This was the turning point of this doctoral research and the beginning of phase two that saw me become integrated into the field as a participant included in meetings and events.

Phase Two, Part One: The Experts

In a multisited design approach, an investigator can observe different sites in which people play a role in the creation, production, distribution and reception of a given sociotechnical structure. This allows the researcher to get a sense of how different stakeholders dynamically influence one another in making and using artifacts. Before conducting the actual field evaluation, I first became familiar with the key expert stakeholders who conceptualized, designed, programmed and produced the Mégaphone by attending some production meetings and onsite testing during the five months that preceded its official launch, as well as by conducting some semi-structured interviews with these experts. Five experts were interviewed: the technology designer, the two computer scientists who programmed the speech recognition software, the technician in charge of running and maintaining the digital display infrastructure and the Mégaphone concept designer. Most of this field research was undertaken *before the deployment*.

After the deployment, I engaged in a series of five one-hour *post hoc* audio-recorded interviews conducted with the technology designer to immerse myself in a more in-depth understanding of the making of Mégaphone from his perspective, one year after the fact. These five interviews were conducted during his lunch hour during summer 2014. This allowed him to engage in *post-mortem* reflections on the design. All these interviews were conducted in a casual conversational mode with the purpose of trying to document the design process itself and what specific elements of the design were intended to engage users, facilitate appropriation and support interactivity.

Phase Two, Part Two: The Study Participants

Previous research on the design of interactive display-based digital urban technologies emphasizes the importance of identifying and aligning the interests of the multiple groups of stakeholders involved in large-scale public installations (Alt et al.,

2011, p. 261). To attend to this design challenge, my focus was almost exclusively on participants during the ten-week field evaluation, but I also regularly surveyed the space beyond the installation to observe how passersby became peripherally aware of the installation and how they were drawn in by the interventions. Every evening from 7 pm to 11 pm, on Wednesdays, Thursdays, Fridays, Saturdays and one Monday, I was immersed within the installation space, at times participating in the interventions, and at other times, adopting the ethnographer's "fly on the wall" approach to make observations about how people used the Mégaphone. This field work was done over a total of 37 days during a period of ten consecutive weeks.

During interventions, I sat on different benches in the installation space and walked around the plaza, unobtrusively observing speakers, spectators and passersby from different vantage points. I took detailed field notes, photographs and videos of the interventions and made observations about how people invested the space. Each night, I also conducted on average two to five *ad hoc* spontaneous short unstructured interviews with people onsite; these lasted about five to ten minutes. Then, at the end of every evening, I would casually debrief the onsite technician and Master of Ceremony to take note of their observations. Finally, I conducted *post hoc* interviews that lasted between 60 to 90 minutes with over 21 participants. Out of the 21 people interviewed, 16 of them had spoken into the microphone and interacted with the media façades, while 5 of them had remained passive viewers; all, however, had attended more than one evening.

Interviews were all audio-recorded for the purpose of analysis. Three interview sessions were conducted as focus groups to observe how study participants exchanged with others on their experience; one of these was held in English and the two others, in French. Study participants were recruited onsite during the deployment. They were later contacted by email to set up a meeting time for their interview. There were 7 women and 14 men. Seven of them were between the age of 19 and 30, eight were between 31 and 40; one was between 41 and 50, four were between 51 and 60 and one was over 60. Six were university students, seven were artists, two were journalists, one was a media producer, one was a teacher, one was an agricultural seasonal worker, one was an architect, one was unemployed and one was a retiree. Education levels varied between high school and post-graduate educations. Most had never interacted with speech

recognition software or a voice-activated media façade, but had some experience with public speaking. Four had used SIRI™ or GOOGLE™ speech recognition software before.

Because pedestrians constantly walked in and out of the installation, sometimes sitting for an hour, sometimes for only a minute, an exact count of exactly how many people used the installation would be impossible. However, every fifteen minutes, I did a rough head count of the number of people who were standing around, or sitting on, the benches of the agora. The average number of people present in the installation space at any given time ranged between five and eighty (with values from 0 to 275). The average number of people present during scheduled interventions ranged between 10 and 200, while during open mike sessions, this number was between 0 and 60. Over the course of the deployment, a total of over 4800 people were counted in the installation space. They either participated in the installation as speakers or as observers. Out of all those, well over 1000 of them interacted with the system by speaking into the microphone.

2.2.5.   Toward a Public Interaction Design Framework

As these descriptive statistics show, only approximately one out of five people who partook in the Mégaphone experience actually interacted directly with the system. This suggests that public interaction implies more than human-computer interaction. Indeed, in the early stages of this doctoral research – after conducting the first phase of field work described in Chapter Three – it became obvious that people engage with interactive display-based systems in different ways. Observations made during phase one led me to believe that my understanding of the poetics of public interaction would have to factor for participants being passive observers because their role played an equal part in the phenomena. In order to prepare for the ten week field evaluation of phase two, it seemed opportune to reflect on this issue by becoming familiar with some of the frameworks that are concerned with the different forms that participation can take.

Seven years ago, Preece and Shneiderman (2009) published their canonical *reader-to-leader* framework to operationalize an understanding of what motivates people to become part of, and contribute knowledge to, online communities through technology-mediated social participation (p. 15). Driven by a desire to see the use of the social Web

expand to civic engagement in domains that require social cohesion – for instance, in the case of disaster or emergency response – they study the mechanisms by which readers can become contributors, collaborators and leaders on social media (p. 16)

Building on this research, Fischer (2011) also proposed a framework dubbed *Ecologies of Participation* to guide the design of interactive platforms in emerging applications domains such as education, healthcare, architectural design and urban planning (p. 47). By encouraging practitioners to participate in real-time, embodied settings, Fischer is suggesting that this type of framework can potentially be applied beyond online social media, to real semi-public and public spaces (pp. 48-49). His technology design concepts aim to incite "consumer cultures" to become "cultures of participation" regardless of whether they interact online or not (p. 42). Further, Fischer not only advocates engaging users by designing for tiered levels of participation, he also recommends that they be actively involved in the design process in order to "democratize design and innovation by shifting power and control toward users" (p. 44).

While the former describes "levels of engagement", the latter focuses on the "roles" that users play. Both frameworks are of great value but neither specifically addresses the action of participation *in public space*. However, the international design studio, OCUBO – which specializes in video mapping and interactive projections – has produced a presentation which, from concept to exhibition, places an emphasis on the participative aspect of installations. Figure 2.6 illustrates this framework for designing participative art experiences that merges physical and digital dimensions. This framework is germane to this doctoral research because it outlines how practitioners can imagine designs that factor for public participation that is digital and non-digital, with or without an interface, and in real time or asynchronous (Purnelle, 2015). Chapter Three refers to it briefly to discuss this issue in relation to field observations and interview data.

There are other frameworks in HCI research that address the question of transitioning from one type of participation to another, but given their focus on spatial engineering, instead of human factors, they do relate less to the approach taken in this doctoral dissertation. However, all three of the above frameworks partially help to illuminate the research results obtained in phase one. Consequently, in preparation for

the Mégaphone field study, I drew on all of these to operationalize concepts that describe the different possible ways that people could engage with displays in public space. Figure 2.7 shows how the resulting framework describes participants according to their actions, which translate into "levels of participation". This allowed me to think about public interaction in a way that at once included the passive or inattentive viewer on the lower levels and the very engaged collaborators and "hackers" in the top levels.

This customized framework became a useful tool to think with during field work and later during some of the analyses done during the reporting phase, but it was also used to initiate discussions with some of the experts during the interviewing process. For instance, when I showed this Figure 2.7 to one of the expert interviewees, he told me that he found it very useful and kept a copy for internal use because he said that it is a good reminder to his team that passive viewers are just as valued as engaged interactants. Contrary to HCI designers, they are not deploying interactive artifacts only for people to interact with. They are also deploying them to create new types of social experiences in public space. This means that "interactive" and "interaction" can have different meanings and goals. This is why it is so important to define *public interaction*:

> In public space, you need all kinds of forms of participation. You need people taking the lead in making the public space a space of activity, while others watch. People can then take turns doing one or the other if they feel so inclined. (P. Fortin, interview, 7 May 7, notes)

This comment suggests that studying the design, implementation and reception of interactive digital displays in public space is better served by an interdisciplinary approach that takes into account social dimensions and grounded understandings. Figure 2.7 will be further discussed in detail once it is used as an analytical tool to describe the rationale that underlies the study design of the Mégaphone deployment in Chapters Five and Six.

Chapter 3.

New Interfaces in an Urban Digital Laboratory

> *Large screens add new dimension to public spaces. With interactive technologies the possibilities are wide open for new ways of experiencing time, space and community.* (Soh Yeong Roh, 2009, p. 158)

Multi-sited or not, an ethnographic methodology is premised on participant observation (Marcus, 1995, p. 114). It is this research method that brings ethnographers to engage in fieldwork and construct each site as they discover their object of study. The first phase of this process, however, entails encountering new people and places to bring back visions of what the different sites might look like and to begin reflecting on how these might be interrelated. Ribes and Vertesi (2013) refer to this as "scoping out the sites". During this exploratory phase, the researcher may appear to be less a participant observer and more of an outside observer, especially when fieldwork is in its early stages. And indeed, it would be difficult to parse out what was participant and non-participant observation when this doctoral investigation first began. At what point did I, as principal investigator, become a participant? What defined my status as a participant? Is this process any different when the ethnographer observes multiple sites instead of a single site? In that context, what if the ethnographer becomes a participant observer in some of the sites but cannot do so in the others? As Crotty (1998) remarks, raising such questions and reflecting on what forms participant observation takes are part and parcel of the research process, and by extension, of the ethnography itself (pp. 6-7).

This investigation was initiated in April 2012 with the objective of generating design knowledge on interactive dynamic digital display-centric technology deployed in urban environments. But fieldwork itself started out when I stumbled upon such artifacts during an event called the *Digital Pathway*, an eighteen day urban arts festival that took place in Montréal from May 17th to June 3rd, 2012. This first instantiation of the *Digital*

Pathway saw no less than eight architectural-scale media façades being used by artists to showcase their interpretative artistic works in public space. Each installation proposed its own unique visuals and innovative use of interactive technology to suggest new possibilities for public interaction. I believe this event was the first site because it was the harbinger of sites to come: its investigation set off a chain reaction for the encounters and threads that followed. The location these took place in was to serve as the terrain for most of this dissertation's empirical fieldwork: the Quartier des Spectacles – a French-language moniker that can be loosely translated as the "district of spectacles" – and indeed, it is a place that has much to offer the eyes, but it is also a place where the gaze becomes public and seeks interaction with the gaze of others.

Because it is at once a physical place, a web of different stakeholders, a series of events and a collection of digital artifacts, the Quartier des Spectacles became the *core-site* of this doctoral research: it was the reactor that triggered events, encounters and the emergence of other sites, and it was also the nucleus around which these other sites orbited, which together formed the macro-structure upon which I crafted this dissertation's object of study. For inherent in the multi-sited approach is the study of multiple sites – places, people and events that connect to the central site – in order to decentralize the investigator's view of the core structure. This is done to get a better sense of how these forms of organization fit into a broader macro-structure, which then leads to identifying the challenges and opportunities of and between this network of sites. But more importantly, it is a methodological strategy that helps the investigator step back to become more reflexive about how they go about constructing the sites as objects of study. One of the questions this type of fieldwork raises is: to what degree is the act of crafting these sites related to the process of being a participant observer?

The first section in this chapter adopts a narrative mode to describe how the Quartier des Spectacles came to be the first professed digital urban laboratory. This is followed by a section that offers an overview of HCI approaches and concepts that can be related to the qualitative design analyses of the interactive display-based artifacts presented in the last section. Taken as a whole, this chapter is a partial text that offers an account of the first phase of this doctoral research: a series of explorations and encounters that led me to discover innovative interactive artifacts and design

approaches, which, in turn, brought me to engage with stakeholders connected to the Quartier des Spectacles. I believe that it is this process that marked my commencement as a participant observer. But can an ethnographer ever really know exactly what the decisive moment is, when the shift from non-participant to participant observer happens?

3.1. The Core-Site: Montréal's Quartier des Spectacles[5]

The past decades has seen major urban renewal projects undertaken all around the world to potentiate the new knowledge economy's "creative cities" by rebranding them as attractive and innovative cultural metropoles (Florida, 2005, p. 152). It is in this context that the city of Montréal initiated its new Millennium plan to build a permanent digital infrastructure and free wireless network within the boundaries of its newly refurbished downtown area. By tracing the history of this development, the following sets out to show how, in matters of design, urban planning and technological developments, the past often informs the future. Also suggested in this ethnography is that large-scale technological infrastructures are costly and complex enterprises that involve major challenges and a large number of institutional actors. I am inclined to think that being introduced to these actors and building bridges with them was what led me to become a participant observer: over time, they invited me to participate in several of their meetings and events, collaborated on this doctoral work's research outcomes as well as formally and informally used the product of this design knowledge as a source for drafting their own reports and as a springboard to reflect on the impact of their work. I cannot recall at what exact moment I became immersed in this sociotechnical field, but the analyses in this chapter came as the result of starting to apply collaborative methodologies.

3.1.1.   Birth of a Digital District

The Quartier des Spectacles is a district administered by the Quartier des Spectacles Partnership which obtains 98% of their funding through the City of Montréal's taxation revenue. A non-profit subsidiary of the City of Montréal, the Partnership is run by a board of director which brings together several district stakeholders such as city officials, cultural producers, media companies, festival organizers, venue managers as well as representatives from non-profit organizations, tourism agencies, art centers,

universities and the state library. Its main mandate is to add value to the Quartier des Spectacles by creating conditions that maintain its cultural vocation, offer a wide array of social and artistic experiences to the public at large and support new forms of interaction in the public space they manage. When the City of Montréal decided to completely renovate and redesign some of its sites to make them more amenable to cultural events, artistic installations and urban interventions, the old neighborhoods on which now sits the Quartier des Spectacles were some of the first to be identified as strategic locations.

The Quartier des Spectacles is situated in the eastern part of Montréal's central business district. Spanning an area of roughly one square kilometre, its boundaries – set in 2003 – map partly onto the downtown area, partly onto the city's historical *Quartier Latin* neighborhood, which derived its name from the legendary *Latin Quarter of Paris*. Like its European eponym, this quarter has been the beating heart of French culture in the city ever since it served as the cradle of the first French-language university campuses in 1895. Over the twentieth century, it became a noted haunt of students and intellectuals, but also of artists, poets, writers, and musicians, echoing the bohemian culture of nineteenth-century Paris.

South-west of the Quartier des Spectacles is Montréal's Chinatown, the Quartier International de Montréal and beyond that, Old Montréal and its historic port – one of North America's major trade and transportation hubs since the mid-twentieth century. Because of its landmark location and how it lies across the threshold of these districts, the Quartier des Spectacles is a liminal space that has lived several lives, notably as an old *faubourg*, as the "Little Paris of North America", as a test-bed for a utopian mass social housing project, as a site for underground culture and artistic production, as a commercial zone, and of course, as the city's renowned garish Red Light District. Today's Quartier des Spectacles is increasingly a site for leisure and tourism that proposes upscale offerings of cafés, restaurants, boutiques, museums, art galleries, exhibition centers, festival productions, concert halls and venues for live shows. But during the Prohibition era, when the sale of alcohol was banned everywhere in North America except in the province of Québec, this city quarter was home to movie theatres, dancehalls, nightclubs, cabarets, speakeasies, gambling joints, brothels and a number of

scandals, which earned Montréal the reputation of swinging metropolis and city of pleasure with an exuberant nightlife.

Despite its recent gentrification by the Quartier des Spectacles' urban renewal project, tales of Montréal's clandestine nightlife from the late Quartier Latin have not been lost. In fact, they are often recreated; sometimes explicitly in cultural exhibitions such as the *Centre d'histoire de Montréal's* "Scandal! Vice, Crime and Morality in Montreal, 1940-1960" on display from November 2013 to December 2016 (Leclerc & Charlebois, 2013). More recently, reference to the neighborhood's history has been implicitly embedded in the district's urban design, with ornamentation such as the illuminated walkways of the Quartier des Spectacles' *Luminous Pathway* seen in Figure 3.1. Visible only at night, this distinctively ambient lighting signature permanently set up in 2006 consists in a double row of overhead red spotlights that create a luminous carpet at street level to guide pedestrians towards twenty-six noteworthy venues located throughout the district. On the pavement, these pulsating red projections signal that a building is a designated cultural space open to the public. As elements of design, the resulting motif becomes a signifier that brands the neighborhood as a former "red light district", but also alludes to stage lighting and the red carpets laid out at *premières*. Although this decorative lighting initiative was never interactive, it foreshadowed the Partnership's later *reconnaissance* into interactive digital artifacts.

Implemented in 2006, this lighting signature is the first of many design initiatives that has come out of the Quartier des Spectacles' *plan lumière* – their architectural lighting plan. Increasingly popular, this global approach to sustainable urban infrastructure development and planning consists in rationalizing street lighting by using architectural lighting to enhance the patrimonial sites, heritage monuments, commercial areas and cultural districts of a town or urban neighborhood. The French city of Lyon pioneered this practice as early as 1989 with many cosmopolitan cities all around the world following suit ever since. Some critiques argue that lighting plans can be initially costly, increase atmospheric light pollution and endanger the natural ecosystem of a region. However, Montréal, like most European cities who have adopted this urban branding strategy, uses lighting systems and techniques that adhere to the *dark sky* criteria in order to optimise light distribution and avoid light scatter. Specifically, in the

Quartier des Spectacles, the façade of thirteen buildings of interest are enhanced with special ambient architectural lighting as seen on some of the edifices in Figure 3.2.

The broad thrust of the Quartier des Spectacles' plan lumière was originally overseen by the first President of the Quartier des Spectacles Partnership, Charles Lapointe, and engineered by *Intégral*'s artistic directors: Québec-born, Jean Beaudoin and renowned French-Swiss designer, Ruedi Baur. Internal documents state that the original intention behind the Quartier des Spectacles' architectural lighting redesign was multifold: first, to brand their district as a territory designated for leisure and culture; second, to make signage within the site more comprehensive, effective and strategic; and third, to illuminate buildings and spaces in aesthetically pleasing ways that would highlight the district's architectural heritage (Partenariat, 2012, p. 11). In a promotional video produced by the Partnership, Charles Lapointe and Ruedi Baur explain how this played itself out with the red spotlight motif, a small element in a bigger design project:

> It was also for a long time Montréal's Red Light District. We did not want to obliterate this element. We started with these red dots, to brand the district. This luminous red carpet symbolizes Montréal's nightlife. When there are red dots, it indicates a cultural institution, an accessible space…This will be reinforced by pedestrian crossings' markings also using lighting to point to the various spaces on either side of Ste-Catherine street. (Quartier des Spectacles, 2010,~1min30s)

From its very inception, their approach led to much experimentation through trial and error. For instance, in 2009, the Quartier des Spectacles launched the *Intersections Signalétiques* seen in Figure 3.3, which Baur refers to as the "pedestrian crossings' markings". This digital crosswalk pilot project was deployed for less than three weeks. It took the form of a digital signage video display projected onto the pavement from an LED street light high above an intersection, programmed to switch streets corners synchronously with the traffic lights. This dynamic display of human-scale luminous white fonts intrigued pedestrians who would often try to play with the letters by intercepting the projections on their own body as they crossed the street. But the pilot project was short-lived. Some city officials decided it had to be put on hold because it presented a dangerous hazard that might cause traffic accidents. Although the Partnership team has expressed their intention to bring them back, the city has maintained its provisional ban to date (M. Charpin, interview, January 9, 2014,~45sec).

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This particular example speaks to the idea that, like government-industry research and development programs, a public-private infrastructure partnership may have more freedom to invest in hit-and-miss projects. As Stiglitz and Wallsten (1993) have remarked, it is important to rethink "what success really means in the context of government-industry R&D programs… a failed project does not mean that the program is a failure" (p. 70). Funding research and development may be inherently risky but innovation builds on lessons learned from failure as much as from commercial successes. Indeed, the Partnership's willingness to test out new approaches and systems seems to have led them to pioneer an infrastructural model that is unique in the technoscape of today's global cities. How sustainable this model will be in the long term is impossible to predict since this issue largely depends on what orientations technology design takes in the years to come. However, for now, the Partnership increasingly uses the district they manage as an open laboratory to experiment with light as a medium for content creation, with a greater focus on social returns over commercial ones.

The executive director of the Partnership, Pierre Fortin, admits that the idea of using digital technology as a toolbox for creativity and experimentation came about accidentally. During the implementation of their architectural lighting plan, many local design firms were commissioned to create billboard installations and media façades that would promote the district's cultural programming (P. Fortin, interview, May 7, 2013, notes). Little by little, it became clear that these designs were artistic creations in their own right as were the district's buildings enhanced by the architectural lighting redesign. Light provided an ephemeral material to try out new concepts and designs. In fact, this idea was always implicit in the urban branding plan, as expressed by Moment Factory's Amahl Hazelton in another promotional video produced by the Partnership:

> The most challenging aspect of collaborating with the Quartier des Spectacles was the challenge of creating a canvas within which light would be the medium, the paint, and all of Montréal and the Quartier des Spectacles' creativity could express itself through this canvas. (Quartier des Spectacles, 2012,~2min50sec)

With this poetic orientation in mind, the Partnership undertook the next phase of the district's development which involved using the permanent digital architectural lighting infrastructure to deploy large scale media façades for artistic purposes. Through

calls for projects and arms-length curating, the Partnership would put their media architecture at the disposal of the local and international electronic art communities.

3.1.2.   From Architectural Lighting to Interactive Media Façades

The Quartier des Spectacles' very unique trajectory from architectural lighting redesign plan to monumental media façades highlights the oft-overlooked history of public media displays as an art form in which light is used as a material to sculpt and define the cityscape. As early as the 1930s, architectural lighting designers such as Richard Kelly and Stanley McCandless were pioneers in crafting electric light into signs and images which created the effects of "nocturnal modernity… [whose] roots could be traced back to the theatre" (Neumann, 2010, p. 12). Thus, the dubbed "Electronic Gothic" billboard aesthetic of places such as Times Square, in New York, or in other cosmopolitan cities, owes as much to the art of architectural lighting design than it does to the use of monumental signboards and placards as advertisement media. This perspective also suggests that whether they emit radiant light as do LED or LCD screens, or whether they produce ambient light as do media façades reflecting projected light that floods the built environment, digital displays may remediate sculpture, architecture, theatre, cinema, photography and advertising. More importantly, after dusk, the dancing colored light effects of dynamic digital displays can translate into an immersive, embodied experience that cuts across language barriers and cultural divides, for the content of displays is light. And just as music is a *lingua franca*, so may light be.

While Huhtamo (2009) traces the history of public media displays to Ancient Rome, he further claims that it is the invention of electricity that saw dynamic displays and media façades make their appearance in public outdoor space. As far back as the nineteenth century, incandescent bulbs were used to illuminate advertising billboards while magic lanterns were used to project images on screen surfaces, walls and public monuments (pp. 22-24). Although today, these media platforms are electronically engineered, they often tend to serve similar purposes; typically, they are used to publicize commercial content, news and location-relevant information.

Likewise, Manovich (2001) argues that digital technology has borrowed from older traditional forms – such as print and cinema – to remediate new media objects into *cultural interfaces*, a concept he defines as computerized screens that encode culture in digital form (pp. 69-70). Because digital screens can now be used to mediate action and control, the design of cultural interfaces presents significant challenges with all new implications that reach far beyond issues of representation (pp. 88-91). A case in point is how unleashing their interactive potential at the scale of the built environment might redefine people's everyday experience of the city. And, of course, under the auspices of what authority – and whose interests – will such a programme be undertaken?

The field study of the *Digital Pathway*'s first deployments revealed that a number of local artists and media companies used the media façades and surrounding settings to experiment with new expressions of electronic art that proposed alternatives to the usual commercial content found in this central business district. In this sense, many deployments in the Quartier des Spectacles can be said to echo some of the concerns of the *Urban Screen* movement, and the explorations that came out of these concerns. But there is at least one major difference. While the *Urban Screen* movement was organized as an activist project that promoted the appropriation of digital public displays through festivals and events, the Quartier des Spectacles was set up as a permanent civic infrastructure that provides digitally-augmented public spaces after dusk on a year-round basis. To be fair, however, it was not the first. With over 18 screens, the Big Screens project originally launched in 2003 by the BBC arguably anticipated this model, but those screens were all located in different cities throughout England, rather than in a single district that operates as a managed public space, as does the Quartier des Spectacles.

In fact, the real precursor to the Quartier des Spectacles is literally located at the other end of the world from it in the Asia-Pacific region. The first large-scale digital public display deployed in public space to deliver community-relevant content seven days a week is the giant LED screen in *Federation Square*, in Melbourne, Australia, set up in 2002. Centrally located and embedded into the decorative façade on the southern side of the Transport complex, it faces visitors in the intimate plaza. With the years, the "Barco" big screen gradually started being used for a wide-range of purposes from prompting public dancing events to showcasing digital art installations from all over the

world as well as to broadcast breaking news, sports games, culturally-relevant content, political speeches and live site programming with other Australian or foreign precincts.

With its focus on managing a public space that prioritizes the diffusion of content that is cultural rather than commercial, Montréal's Quartier des Spectacles is arguably Federation Square's distant relative in that they do share some of the same DNA. Both these managed public spaces have digital public infrastructures that offer large dynamic displays and free Wi-Fi to its diverse publics onsite. More importantly, they have surprisingly similar civic and cultural charters. The main difference between them is that, since 2012, the Quartier des Spectacles is an actual city district with multiple media façades rather than a plaza with a single outdoor LED screen. In fact, the Partnership simply repurposed their architectural lighting infrastructure to display more sophisticated, dynamic and interactive cultural content on the façades of some of their site's buildings.

3.1.3.   A Site for Digital Innovation in the City

Because of its infrastructural nature, the Quartier des Spectacles can arguably offer artists more flexibility to test prototypes and reiterate system designs on a large scale. In the digital arts and in the design of computer systems, *scalability* and *extensibility* have presented significant challenges in the development of large-scale projects. Having access to a real-world setting where such applications and displays can be tested over long periods of time is a luxury that most research labs cannot afford, but certainly would benefit from. One could argue that research on the robustness, stability, viability and sustainability of large-scale systems has been largely impeded by the fact that practitioners seldom have access to such contexts to deploy their systems. As a result, aesthetic innovation in this research domain has often been instigated by independent artists and designers whose main motivation was not research or profit.

With its vibrant digital art community from all over the world, over the past decades, Montréal has become a burgeoning center for the practice of electronic arts and the video game industry. The Quartier des Spectacles is thus uniquely geographically positioned to offer researchers, creative communities and industries an opportune outdoor urban laboratory space within their district to favor innovation in the

rapidly shifting research terrain of interactive technology. This synergy is by no means the outbreak of a perfect storm; in 2007, the City of Montreal was already publishing strategic reports on the importance of tapping into this potential (Beaudoin, 2007, p. 27).

Consequently, the Partnership has invested significant time and resources in optimising their permanent digital infrastructure which they are solely responsible for operating and maintaining. The main attribute of their digital infrastructure consists in a web made up of dozens of kilometers of fiber optic cables that have been laid out underneath the pavement throughout the entire district to efficiently connect their master control-room with interactive digital artifacts that are deployed within its borders. The Partnership also commissioned the Montréal firm VYV to develop the Photon software which recreates precise 3D architectural mappings of the nine media façades of the buildings targeted by their video projectors. Figure 3.4 shows the exact location of all this media architecture on the district's map: the numbers embedded in the red placemarker icons indicate the nine permanent media façades, while the letters embedded in the blue placemarker icons indicate temporary displays referenced later in the last section of this chapter. This turnkey "technological park of video projecting equipment" – a moniker that the Partnership has used since 2011 to describe the complete set of equipment, systems and software that make up their digital infrastructure (Partenariat du Quartier des spectacles, 2012, p. 12) – allows content creators to produce site-specific installations around any of the nine media façades at a lower cost, and the Partnership to rationalize the cost of the public artworks it commissions.

Further, the Partnership's digital infrastructure can accommodate a wide array of interactive artifacts in strategic locations of the Quartier des Spectacles' 1km^2 district which have special access points to the underground fiber optic cable network; the nine media façades make up but one small part of this technological park. Figure 3.5 illustrates the basic model used by the Quartier des Spectacles to provide digital interactivity on the entire site. In the case of the media façades, the thick yellow lines represent surfaces that can be targeted by Christie video projectors. Located on the rooftop of buildings adjacent or facing the media façades, these projectors are protected by custom-designed weather proof casings, each equipped with its own servers, surveillance camera systems, temperature probes, HVAC heating and cooling systems,

remote control projectors, automated email alerts and tools to manage content online, as seen in Figure 3.6. All of the projection site casings are linked to the master control-room via fiber-optic cables, but most maintenance tasks can be performed by technicians on duty from their smartphone anywhere onsite or offsite. From street level, end users can interact with the media façades through their smartphones or other input interfaces made available on the site itself. Depending on the technical requirements of the particular deployment scenario, interactivity is made possible directly with the video servers housed in the casings either through a wire connection (fiber-optic or network cable, etc.) or else through the Partnership's own robust wireless network (3G/4G, WiFi, etc.) which they make available onsite for universal access.

To summarize, all of the above constitutes what the Partnership calls their "toolbox model" which is theoretically open to the Montréal community. In reality, however, content contribution to the Quartier des Spectacles' media architecture and experimentation with their facilities presupposes some degree of technological expertise. Not to mention that the Partnership maintains control over who has direct access to their toolbox through a selection process, which includes calls for projects and some degree of internal vetting. But, by turning their toolbox over to artists and designers (i.e. the experts) for the production of cultural content, the Partnership is ostensibly encouraging them to engage in conversation with the general public and with the space itself.

In this sense, one could say that what the Quartier des Spectacles offers is a way of delivering technology and space as a public good within the confines of a city district that has a cultural vocation and is one of Montréal's most touristic areas. As a digitally-augmented civic infrastructure that can foster the development of the three economies that form the cultural domain – the "public cultural commons", the user-generated "gift economy" and the "commercial cultural commons" – this innovative and experimental model is in fact very similar to the Internet, except that its experience blends the virtual with the architectural (Murdock, 2010, pp. 225-228). As people navigate their way through the Quartier des Spectacles, they can choose at which level they wish to engage with people, technology and content: Do they wish to simply consume content by remaining passive observers? Do they lurk about? Can they actively search for different content by taking different trajectories throughout the expanse of the Quartier

des Spectacles' site? Can they create and upload their own content onto this site? Can they collaborate with others? Can they organize other people's content? Can they hack or game the digital systems and artifacts? Can their contributions or presence reconfigure the public space?

According to Fortin, the primary purpose of this permanent digital infrastructure is to catalyse public interaction and showcase interactive and non-interactive public art pieces in order to "create new ways of being together in public space" (P. Fortin, interview, 7 May 2013, notes). The executive director also explains that the Partnership seeks innovative strategies to "enable the appropriation of public space through cultural offerings and events, street animation and games" – as is evidenced by the Partnership ambitious year-long programming that goes far beyond the digital. But the nervous system of the Quartier des Spectacles is unmistakingly digital: all of the onsite district lighting, sound amplification systems, water fountains, surveillance cameras and most of the signage system is run from the consoles and servers in the master control-room. They also actively maintain an online website to crowdsource and promote their events.

In effect, the Quartier des Spectacles' "toolbox model" not only tests new ways to deliver technology as a public good, it also nudges alternative forms of interaction and interactivity in urban settings by providing a context for artistic experimentations in digitally-augmented public space. And indeed, the Quartier des Spectacles announced in 2014 their intention to activate their nine outdoor media façades, digital access points and Wi-Fi zone as a digital urban laboratory (Corneau, 2014, p. 1). It remains to be seen how this will materialize. But in the meantime, events like the *Digital Pathway* have allowed artists to experiment with the deployment of technological systems that support intuitive forms of interaction based on body movement, gestures, voice and sound.

The last section of this chapter will present this doctoral dissertation's first set of design research findings. It will argue in favor of taking a relational approach to interface design; it will do so by grounding this discussion with detailed descriptions of interactive art installations deployed in the Quartier des Spectacles that illustrate different interaction strategies. Analysis of these findings consisted in reverse-engineering the data to start formulating some interface design considerations that might support public

interaction. They are discussed in detail here to provide a grounded understanding of the context in which the rest of this doctoral research was conducted, namely to present the kinds of artistic interactive digital artifacts deployed in the Quartier des Spectacles and to show how this district strives to enable certain types of cultural practices that support public interaction. Before, we look at these examples of practice, however, the next section presents frameworks that provide definitions to illuminate these descriptions.

3.2. Key Approaches to Interface Design[6]

Empirical research in this work was conducted using an inductive approach. First, qualitative observations and investigations were made of some of these interactive artifacts in public space to document and study their interface design. Second, some of the artists and curators that produced these artworks were interviewed. Third, a review of primary source material describing these artifacts was surveyed. Fourth, in keeping with Van Niekerk and Rhodes (2011), the literature was consulted *after* the data collection and analysis phases in order to minimize assumptions around pre-existing concepts (pp. 99-100). Although the use of extant theory in inductive research remains a contested issue, the rationale here was that such a "purposeful use of extant theory can be a source of creativity and insight, which a more traditional inductive approach would not afford" (Furniss, Blandford, & Curzon, 2011, p. 114). The literature was thus used to further illuminate and finesse the analysis. Before presenting the research results, this foregoing section expounds the theory that guided the *post hoc* analysis of these artworks encountered in the field. Accordingly, it offers a selective overview of HCI approaches and concepts related to interface design to inform the discussion on interfacing devices used in digital art installations that include public media displays.

3.2.1. Crossmodal Experiences and the Digital Arts

Benjamin (1969) was one of the first to argue that each technology of representation offers its own attributes to extend or compress the way we perceive and experience the matrix of time and space (pp. 222-223). Indeed, today's computerized screen technology comes with an unprecedented affordance. Because it takes the form of digital data, it is now possible to transform media content into other media types,

forms and sensory modalities (Manovich, 2001, pp. 46-47). Rendered possible by electrons – the very substance that digital information is made up of – this phenomenon is known as *transduction*, a three-step process which consists of, first, capturing raw data in the form of input; second, converting this data into an electrical signal according to a set of prescribed protocols; and third, outputting it into an altered state (Van Loon, 2008, p. 118). Insofar as this characteristic of new media enables the conversion of one sense impression into another, digital art can be said to be a medium that supports crossmodal interaction (Fortin, Hennessy, Baur, & Fortin, 2013, pp. 93-94).

But is this crossing over of sensory perception a novel phenomenon in people's experience of art? Merleau-Ponty (1945) claimed that everyone has a "synaesthetic perception" of their environment (pp. 273-275). Notwithstanding that at any given moment, some sensory impression may overpower others, he purported that perception occurs through a "phenomenal field" in which different sensory modalities intermingle and mutually resonate with one another as sensory impressions are experienced (p. 80). For instance, we can feel the softness of a fabric without touching it or hear the thump of a falling body even when it is observed without sound. If crossmodal perception occurs when a single sensory stimulus influences one or many other senses, then like Merleau-Ponty's model of the phenomenology of perception, it implies that the senses belong to a structure that links them physiologically at some point during or after a given stimulus.

Many works of art defy Aristotle's concept of sensory discreteness, which suggests that we perceive an object according to the sum of the discrete sensory modalities it stimulates: its edges may appeal to our sense of vision *and* its sound to our sense of hearing, *and* its texture to our sense of touch (Aristotle, 2004, pp. 12-13). Not only does the experience of art tend to confound sensory modalities, but many artists have learned to use materials, colors, forms and aesthetic strategies to produce artwork that stimulate perception across several senses or indirectly awaken one sense through another as when a sound is heard, or imagined to be heard, in response to a visual stimulus. With most media, this effect is achieved by association, metaphors, and evocative designs. Researchers specializing in interaction with displays have claimed that crossmodal perception can even be a cultural phenomenon (Yue qtd in Papastergiadis et al., 2013, notes).

In new media, however, artists can use the principle of transduction to draw attention to how sensory impressions mutate into one another or trigger percepts across modalities. In fact, the science of electronics allows today's artist to expose this process in material form. In this sense, digital media can help lay bare the mysterious connection between the tangible and the intangible, the visible and the invisible, the explicit and the implicit or the experienced and the imagined. Insofar as new media interfaces can make manifest how senses interact with one another, creating crossmodal interactions can become a means to expose these poetic relationships.

Further, because new media makes it possible to hypostasize crossmodality in works of art and because electronic artworks are conceived around this affordance, one could say that transduction constitutes a medium-specific property of digital art (Fortin, DiPaola, Hennessy, Bizzocchi, & Neustaedter, 2013, p. 250). Indeed, most of the large-scale display installations described in this chapter propose interactive experiences that remediated inputs across sensory modalities. In truth, this design feature has become so pervasive in the objects we use in everyday life that we rarely give it a second thought. Seeing, hearing and feeling are now routinely combined in one of the world's most ubiquitous devices: the portable phone (De Sá, & Churchill, 2013, p. 79). This becomes evident when it lights up, plays a tune or vibrates to alert users that there is an incoming call or a given location is close (Manovich, 2007, p. 8).

This not only suggests that input and output are to digital art what brushstroke, color and surface are to painting, or what light and contrast are to photography, it also implies that *interface design* constitutes a key factor in how new media objects shape aesthetic experiences. Interfacing devices are the membrane through which input and output are expressed and modulated – and although sensor and actuator technologies make up their nuts and bolts, in the end, user experiences are structured by interfacing strategies and how these call upon the senses.

The next section's study conducted in Montréal's Quartier des Spectacles on interactive display installations suggests that electronic artists often accidentally stumble upon unusual and innovative interfacing strategies in their creative work. A review of the literature also shows that as far back as the early seventies, artists such as Peter

Campus, Vito Acconci and Bruce Nauman pioneered large-screen interfacing strategies by experimenting with human-scale video art installations (Rush, 1999, pp. 122-124; Rush, 2003, 30-33). James Turrell is a contemporary artist whose work also calls to mind crossmodal perception and perhaps a more abstract understanding of what constitutes a display experienced in real space. The work of these legends and many lesser known artists arguably anticipated interface design thinking. The next subsection examines scientific trends in this area. This overview of the literature will be used to frame the discussion on examples of practice in art in the last section of this chapter.

3.2.2.   Natural User Interfaces (NUIs)

One of the major research trends in HCI is driven by the concept of *Natural User Interfaces* also known as NUIs, which proposes to rethink interface devices so they are responsive to "more natural forms of interaction such as touch, speech, gestures, handwriting, and vision" (Ballmer, 2010, para. 4). The assumption that underlies this approach to interaction design is that NUIs are said to be more intuitive and usable because they are arguably better adapted to everyday human actions, and thus more natural and easier to use. NUI advocates believe that developing interactions around a wider range of input modalities will enhance interactants' sense of power, offer better opportunities to design new forms of interactions, and more holistically blend users' actions with technology.

Because every new human-computer interface typically presents its own set of challenges and learning curves, Norman (2010) argues that natural user interfaces are not inherently natural, but certainly useful in enriching the existing repertoire of interaction techniques by adding more touch-based, gesture-based, and speech-based interaction modalities to the existing arsenal (p. 10). In the same line of thinking, Wigdor and Wixon (2011) argue that adopting a NUI approach effectively multiplies expressive capabilities (p. 191). These remarks speak to the fact that interface design is not only a determining factor in what is *vs.* was is not possible in the domain of human-computer interaction, but also in the realm of art.

3.2.3.   Design Approaches for Large Display Interfaces

In relation to screen technology in particular, Müller, Alt, Michelis and Schmidt (2008) offer a detailed taxonomy of design factors that support interaction including cognitive factors, interaction phases, interaction modalities, and mental models such as conceiving public displays either as posters, mirrors, windows or overlays (pp. 1289-1292). Others metaphors that have been proposed to conceptualize the design of interactive public displays include *public notice areas* (Alt et al., 2011, p. 259); *community gardens* (Calderon, Fels, Lea, & Neumann, 2011, 1); *theatrical stages* (Kuikkaniemi, Jacucci, Turpeinen, Hoggan, & Müller, 2011, p. 41); and *digital soapboxes* (Foth, Agudelo, & Palleis, 2013, p. 726).

Beyond these dimensions, there are two aspects of large public displays that define them as a distinct type of interface: first, they can and are often used by more than one person, and second, they are deployed in a public context. Accordingly, design concepts and frameworks that place an emphasis on these seem particularly well-suited to developing the interactive potential of displays. This is the case, for instance, with the concept of *Shared Encounters* defined as spontaneous forms of communication and interaction that can take place in public places through technology (Fischer & Hornecker, 2012, p. 307). More to the point, *shareability* is a concept that proves useful in operationalizing interaction in terms of entry points and access points in multi-user interfaces (Hornecker, Marshall, & Rogers, 2007, pp. 328-329). While Kirsh (2001) defines an entry point as "a structure or cue that represents an invitation to do something – to enter into a new venue or information space" (p. 311), Hornecker et al. (2007) describe an access point as "a set of characteristics that enable the user to actually interact and join a group's activity" (p. 334); the former invites actions and the latter makes it possible. Both these types of affordances are germane to public interaction.

The past few years, however, have seen a new approach emerge that is premised on these very ideas of shareability and shared encounters in conjunction with that of natural user interfaces. Known under the moniker of *Social NUI*, it aims to facilitate thinking about multi-user interface design at a more abstract level.

3.2.4.   Social NUIs

Norman (2010) actually argues that the term NUIs is merely marketing rhetoric appropriated by Microsoft in 2010 to frame a research agenda that was increasingly focused on gesture and a more holistic integration of everyday actions (p. 6). This caveat, aside, O'Hara describes them as "interfaces that make innovative use of existing human capabilities including and often combining different input modalities such as voice, gesture, eye gaze, body interactions, touch and touchless interactions" (Vetere, O'Hara, Paay, Ploderer, Harper, & Sellen, 2014, p. 215). The term NUIs is also used to describe new interaction mechanisms in which naturalness is understood as something that is bound up in interaction itself (O'Hara, 2014, notes). While positivistic perspectives of naturalness assume that most people basically act in certain ways that can be universally observed and represented, O'Hara, Harper, Mentis, Sellen and Taylor (2013) are in favor of a NUIs approach that finds its roots in a constructivist epistemology — the phenomenological tradition as well as Wittgenstein's theories — which see action and social meaning as mutually constitutive of one another (pp. 3-4).

Many of the HCI researchers that have been developing the NUIs framework are from the field of computer-supported cooperative work (CSCW), which is concerned with how people use technological systems to communicate, collaborate and coordinate their activities (Grudin, 1994, p. 22). Some of them, such as O'Hara, have been concerned with the idea that NUIs are too focused on the single user's relationship with the interface and by extension, the system. To address this problem, they have developed the concept of Social NUIs because they felt that the concept of NUIs needed to be reframed into a model that could support more possibilities for action. They describe Social NUIs as interfaces that "facilitate new forms of social interaction, participation and collaboration – how we communicate with each other, play together, learn together, and collaboratively work together through these technologies" (Vetere et al., 2014, p. 216).

This new approach is largely about the shareable nature of multi-user interactive systems and their interfaces. Perhaps more significantly, it is about how these can be designed for cooperative actions and interactions. Here, the focus is on the relational aspects rather than the nuts and bolts of the devices. Social NUIs also foreground intentionality as a social concern (O'Hara, 2014, notes). For this reason, it is an

approach that arguably places greater focus on meaning and values because it encourages designers to "…extend the broader set of analytical concerns around NUI technologies to consider the meaning and values of these technologies as they are enacted in context..." (Vetere et al., 2014, pp. 216-217).

For instance, one implication of focusing on body movement as an interaction modality is that it makes the interactant's behavior visible to others in the vicinity. NUIs are not inherently social interfaces, but if they work to enhance visibility, they can ostensibly raise social awareness in a well-defined setting, as do verbalizations out loud during voice-based interactions (O'Hara, 2014, notes). Touchless interfaces in sterile surgical settings were some of the first Social NUIs that were implemented under this approach (O'Hara et al, 2013, pp. 9-15). Technologies designed as Social NUIs can also provide a context to enact relationships through play in which case they usually create different levels of engagement on a spectrum from passive spectatorship to active performance, as seen, for instance, during a study conducted with the brain-computer interaction system called the MindFlex® game (O'Hara, Sellen, & Harper, 2011, p. 359). And while a small display Social NUI such as 4Photos™ is designed as a means to engage a family in conversation around the dining-room table during mealtime (Ten Bhömer, Helmes, O'Hara, & van den Hoven, 2010, pp. 57-58), large public displays deployed in urban settings can also function as Social NUIs by allowing strangers to physically enact different relational distances ranging from intimate to remote (O'Hara, 2014, notes).

On the face of it, the Social NUI framework seems to be about public interaction, but in fact, as the above discussion illustrates, the Social NUI framework can be applied in settings that are indoors or outdoors, private or public, and across domestic, leisure or work environments: it was originally developed around scenarios where technology was used to interact in surgical settings that required sterile practices; in family gaming events designed around brain-computer interactions; around the dining table at home; in relation to MOOCs and educational purposes; and to support cooperation and socializing in the workplace (O'Hara, 2014, notes). This doctoral dissertation adds to this extant literature by demonstrating how this approach can be tailored to displays in public space, a small contribution to knowledge that hopefully others will build on in future.

There are other conceptual frameworks that – much like the Social NUI approach – could be applied to interaction in public space or with large display-based systems. However, none of them are specific to the former *and* the latter. For instance, Greenberg et al.'s (2011) *proxemics interaction* and Vogel and Balakrishnan's (2004) *spatial interaction framework* for ambient displays are display specific, but they are mainly applicable to spatial engineering in the context of a lab or semi-private setting. Early publications emerging from this doctoral work presented two frameworks that attempted to bridge the challenges of designing interactions for public space with those of designing for display-based systems, but neither of them placed social concerns at its core (Fortin, DiPaola, Hennessy, Bizzocchi, & Neustaedter, 2013; Fortin, Bizzocchi, Hennessy, & Neustaedter, 2013).

As this research matured however, it seemed clear that the social dimension of public space should be a fundamental principle in any framework that aims to inform interface design for interactive public displays. In this sense, the Social NUIs framework seems like a good starting point for this type of platform. Mapping the first set of findings against the Social NUIs framework helps to better imagine how design can be formulated around social concerns, but it also serves to demonstrate how it could apply to outdoor public space. The next section gives an overview of some of the conceptual abstractions that were induced from this first study of interactive art installations.

3.3. Social NUIs in the Quartier des Spectacles: Toward a Framework for Public Interaction

For a number of years and until recently, many HCI practitioners developing applications to interact with digital public displays used small, ubiquitous, portable devices such as cell phones or smartphones as their input interface of choice. Although this trend was largely spearheaded by engineers, many artists followed suit by using this interaction strategy to conceive their digital art installation. Figure 3.7, for instance, shows Yan Breuleux's *Tempêtes*, a media façade deployed in the Quartier des Spectacles during the *Digital Pathway* at the location indicated by placemarker A on Figure 3.4; this interactive display allowed people to post comments by text messaging.

Although this interaction strategy is still commonly used, it is noteworthy that technicians that work onsite to maintain the Quartier des Spectacles' digital infrastructure have become quite critical of this interaction modality for a number of reasons. These technicians often spend a significant amount of time on the ground around the installations and thus are in a front line position to make observations, but it is also not uncommon for people to ask them for help or information because every technician wears the Quartier des Spectacles' distinctive red shirt or jacket. For this reason, many of them can offer valuable insights on how people interact with artifacts. In particular, they had much to say about smart phones as the input interface.

First, they found that end users are penalized for using their smart phone as an interaction device because their power supply gets used up too rapidly, soon leaving them without a means to interact or communicate until they can recharge their phones again at home. Second, too small an interface tends to reinforce the ubiquitous single-user "social cocooning" interaction scenario that the Quartier des Spectacles' mandate strives to go beyond in the public spaces they manage. Third, many technicians noticed that ease-of-use is seldom an affordance of the applications that are designed for such interactions, and as a result, end users often struggle to follow the instructions and thus lose motivation to follow through; they noted that the payoff is generally not worth all the time and efforts invested in downloading the application and getting through the learning curve. And fourth, technicians also noticed that people seemed to prefer manipulating big tangible input interfaces in order that their actions be visually perceived by as many people as possible (M. Charpin, interview, 9 January 2014,~27min45sec).

With this in mind, the following subsections propose five considerations for the design of interfaces that could enhance public interaction. For illustrative purposes, each example of practice is discussed in relation to a specific consideration. However, these categories are organic to this work and necessarily overlap. As a result, examples of practice often draw on, or apply to, more than a single design consideration.

3.3.1. Interface Size Matters: Design for Human Scale and Reach

In relation to digital displays and media façades, O'Hara et al. (2003) refer to screen size, shape, orientation, height, placement, luminosity, color and frame as *physical ergonomic factors*, that is, physical affordances that are designed into the object (p. xxii). While these constitute basic considerations that designers must first take into account, in the case of *interactive* screen-based system, the form factors of the device used to interact with the main display(s) are equally as important in that they can also serve as entry points that invite encounters and participation around an input interface.

Affording Greater Screen Real Estate with the TRAME Project

Although it predates by one year the *Digital Pathway* deployments of 2012, this example of practice is first included in this analysis because it offers a modest example of how interaction with a media façade can come to be shared more effectively. Like the interactive video projection in Figure 3.7, TRAME sourced user input from people's personal portable devices, but its application called for more screen real estate.

TRAME is an interactive architectural lighting installation deployed from February 22 to 26, 2011 on the media façade of a church adjacent the downtown campus of Université du Québec à Montréal (UQAM) at the location indicated by placemarker 7 in Figure 3.4; born of an initiative instigated by NFB Interactive, the Rendez-vous du Cinéma Québécois and the Quartier des Spectacles Partnership, this artistic creation was produced by Antoine Goudreault in collaboration with twenty students of the 2012 cohort of undergraduates studying in UQAM's *École des medias interactifs*. This was possible because the young design team had access to the signature Photon software created by VYV for the Quartier des Spectacles; this provided them with a turnkey detailed mask of the bell tower for their course project. TRAME was one of the first art projects to make use of VYV's custom-made software. Given that each mapping carefully integrates the specific architectural elements of every individual building's façade, it provided a precise template of the intricate projection areas of UQAM's bell tower, including its peculiar shapes and textures as seen in Figure 3.8.

TRAME's video projections were made up of a series of "episodes" each based on celebrated NFB animation films made by local artists in the past 75 year. From Norman

McLaren to Steven Woloshen, each episode paid homage to a key figure in the history of film animation. From 2010 to 2011, the UQAM students spent over seven months designing an application that could run on an iPod Touch, any smart phone, or an electronic tablet of variable size. During the deployment, anyone with a personal mobile device could download this application from the TRAME website to interact with an episode projected on the bell tower while it was being rendered live. Through simple touch screen commands, people could affect the music, and the speed or designs of dynamic visual motifs in real time.

Although the size of the input interface depended on whether people used their smart phone or a tablet, it would significantly change how people interacted. While smart phones tended to encourage social cocooning, the increased visibility afforded by the oversized screen real estate of tablets made it possible for more than one person to watch a touch-based interaction and thus gather around the tablet. By including observers in the input process, here, screen real estate size created conditions for socializing. Consequently, more than one person could be involved in the interactions.

Diffusing Dynamic Content as an Entry Point with La Vitrine Culturelle I

Like TRAME, the installation seen in Figure 3.9 was deployed in the Quartier des Spectacles before the *Digital Pathway*. It was one of the early experimentations designed for the *Luminous Pathway*, attending to a similar design rationale as the *Intersections Signalétiques* seen in Figure 3.3. Indeed, both use display technology to provide location-relevant information about the programming of the Quartier des Spectacles' cultural venues. The main difference between them lies in the fact that *Vitrine Culturelle I* is interactive, whereas *Intersections Signalétiques* was not.

First deployed in 2008 at the location indicated by placemarker C in Figure 3.4, *Vitrine Culturelle I* is a dynamic digital display made up of 35,000 LED light bulbs, which are intended to visually reference theatre marquises. Although it can only produce abstract figures rendered in low-resolution, its function is actually to inform passersby on what shows and events are taking place in its vicinity. It uses a laser-based tracking device to sense when someone is approaching at less than a few feet away, and then responds by flashing big red shapes that seem to follow interactants, drawing them in

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closer and enticing them to enter through the door past which they are offered more detailed information on the programming in local venues.

When we think of dynamic digital displays in public space, we generally think of displays contained within a framing device placed perpendicular to the ground. Such screens can be horizontal, vertical, rigid, flexible, as standalones or multiples disposed in formations. But as we have seen in this chapter with the *Luminous Pathway* red spotlight projections, the *Intersections Signalétiques* and the *Vitrine Culturelle I* – all deployed in the Quartier des Spectacles – we are increasingly seeing design propositions that challenge the idea of what a display is. For instance, a number of HCI prototypes have proposed dynamic digital displays embedded in furniture such as park benches or tabletops; others as video projections onto the ground (Olivier, Cao, Gilroy, & Jackson, 2007, p. 6). Thanks to flexible display technology, there are now dynamic digital displays used in more organic forms as shown in Figure 3.10 with *Vitrine Culturelle II*, deployed in 2012 at the location indicated by placemarker D in Figure 3.4. This evolution seems promising in bringing displays into public space because it allows one to experience them as architectural elements instead of flat screens that mainly appeal to our sense of sight.

In the practice of architecture, whether the built environment is apprehended as an object or as a spatial phenomenon, it is understood that vision mediates, but does not dominate our perception, which is first and foremost "characterised by tactile apprehension – a matter of habit that persists even during periods of distraction and inattention" (Turnovský, 2009, p. 61). Indeed, screens such as the two *Vitrine Culturelle* do not only call upon our sense of seeing, but offer multisensory experiences that better integrate vision with other modalities such as proprioception, locomotion and tactility.

In keeping with this, the most intuitive design consideration that appeared to enhance public interaction was ergonomic, that is, simply about how an optimal size and placement of the display or interfacing device tended to facilitate access, inclusiveness, co-locatedness and a spatial experience that was more immersive because it called on haptic perception. Interfaces seemed to attract more than one person when they were either of human-scale or slightly larger, and placed within people's reach. The wide wall

model of large public displays placed at ground level is likely the most common example of this. However, this principle especially applies to input interfaces, since they are the devices used to interact with a system. Sometimes, the input and output interface are the same as was the case here with *Vitrine Culturelle I*, where the display produces distinct light patterns in response to human activity in its narrow range of motion detection. In dark settings, such displays can be a powerful entry point that attracts bystanders because their contrast is spectacular and catches the eye; add motion to the mix, and one gets an even more effective means to draw people into public interaction.

3.3.2. Optimizing Perception: Design for Multiple Attention Foci

As is the case in Federation Square, most of the Quartier des Spectacles' urban furniture is non-technological. It includes custom-designed public seating, picnic tables adorned with red parasols, large outdoor exhibition panels used to showcase public artworks and elaborate water fountain installations in the Place des Festivals. The executive director of the Partnership explains that these elements are spatially disposed to encourage people to cluster together in strategic areas. The main objective of this is to draw people into the district in pockets of density that help foster conditions for public interaction. The uneven distribution of the free outdoor Wi-Fi zone throughout the district also tends to keep people in certain areas. Onsite interactivity, however, is seen as a means to have people participate in events where they can then generate their own content. It is noteworthy that here, content is not construed as data but as the product of public interactions with or without technology (P. Fortin, interview, 7 May 2013, notes).

Indeed, according to Pierre Fortin, the Quartier des Spectacles aims to support interactions in public space and emergent content that do not always involve technology. Sometimes, it can occur with media such as chalk or tangible objects (Ibid.). For instance, the Quartier des Spectacles had a giant chess game in Place Émilie-Gamelin, which serves as a good example of a non-technological installation that is – according to Ocubo's "Participative Art" framework shown in Figure 2.6 – interactive in three of their five categories: physical participation, participation through a non-digital object, participation without an interface (Purnelle, 2015). In 2015, this public space was refurbished and renamed the "Jardins Gamelin". It now comes as a motley mix that

includes a restaurant and bar, urban agriculture, a produce market, picnic tables, a stage used as an outdoor venue for shows, as well as video projections on a media façade – the only digital element. At other times, an installation can be technological, but not yet interactive, such as the luminous Place des Festival water fountains seen in Figure 3.11, at the location indicated by placemarker E in Figure 3.4. Fortin describes these fountains as "urban campfires around which everyone can gather", a fitting description that corroborates onsite observations (P. Fortin, interview, 7 May 2013, notes).

Learning from The Water Fountains at the Place des Festivals

Thanks to a complex programming matrix connected to the fiber optic digital infrastructure since 2010, these water fountains can emit different spray patterns and be animated by colored lights. In theory, this system allows practitioners to make the Place des Festivals fountains interactive with applications of their own design, but, before and during the first edition of the *Digital Pathway*, no artist has taken up this challenge thus far, with the exception of Moment Factory, who in 2010 choreographed, *Élixir*, a multimedia urban intervention in which they projected an animated video on the imposing spray of a water fountain seen in Figure 3.12. After testing out different possibilities onsite, the designers decided to bypass the Partnership's digital infrastructure and use a simpler setup: Christie projectors resting on two scaffoldings opposite the water fountains. This suggests that having a digital infrastructure is no guarantee, in and of itself, that it will be developed and used to its full potential.

Other informants interviewed for this research confirmed this. For instance, when COGECO's Chief Technological Officer, Philippe Jetté, was asked if the company's advertisement billboards networked throughout the Montréal underground city would soon be made interactive, he explained that although this technology had been readily available to them since early 2013, the stakeholders involved had yet to decide how interactivity should be commercially implemented. As a result, at the time of writing the billboards were still only being used in broadcast mode (P. Jetté, interview, 26 March 2013, notes). This has also more or less been the case with the Quartier des Spectacles' water fountains: at night, and until recently, they tended to be used like non-interactive displays that emit content in the form of different color light. This changed in 2015 when

Atomic 3 and Generique design's *Maëstro* installation, allowed people to stand on a stage and interactively conduct the water fountains with a baton to the sound of music.

In spite of the fact that the Place des Festival's water fountains have seldom been programmed to be interactive to input data, those fountains were always very popular. People tend to cluster around them and children often play with them by jumping over them and splashing around above them as seen in Figure 3.13. They are certainly interactive in this sense – which involves thinking of interactivity in terms of how output data can invite playful action, a definition which is more aligned with OCUBO's art and culture framework than with the traditional HCI frameworks. Further, the way these fountains are used suggests that a design which evokes urban campfires is yet another ergonomic factor that can facilitate access, inclusiveness, and co-locatedness, but it also offers augmented space syntax[7] because it is a way of imagining interfaces that presents an important advantage: it can help bring people together in public space *around* a site of interest, often the input or the output interface. This affords greater visibility as participants and observers tend to be distributed, sometimes unevenly, over a vast area, which affords multiple vantage points as seen in Figures 3.11, 3.12 and 3.13. This design strategy tends to restructure public space to offer multiple attention foci and points of interest: people can look at the interactive installation and at other people watching, which increases chances of making eye contact or experiencing a sense of connection. Moment Factory's *Élixir* fountains deployed on August 9, 2010 had people watching from many different places, spread out over the Place des Festivals as shown in Figure 3.12; this was possible because the projections were on the water itself.

Interfacing Around an Electronic Urban Campfire for Bla Bla

A few streets away from the fountains, in front of a media façade deployed outside the Saint-Laurent subway station at the location indicated by placemarker 3 in Figure 3.4, another input interface that rekindles the age-old campfire metaphor offers yet another perspective on how the work of new media artists might foreshadow Social NUIs. Custom-designed for a public space installation that was co-produced by the National Film Board of Canada and the Quartier des Spectacles, the luminous podium seen in Figure 3.14 was the interactive portal of entry into the world of *Bla Bla*.

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Originally only available online, Vincent Morisset's interactive hand-drawn animation film was transformed into an interactive human-scale media façade on the occasion of the *Digital Pathway* in spring 2012. As was the case with TRAME, crossmodal interaction was triggered by touch-based input. Here, however, personal portable devices were replaced by a simple trackpad mounted on top of the stationary luminous plinth that sits on top of the podium. The input interface functioned much like the standard trackpads found on most laptop computers today. Indeed, hidden beneath the clean modernist lines and illuminated surfaces of the projecting base was a MACBOOK PRO™ connected to the fiber-optic cable infrastructure that leads to the Quartier des Spectacles' master control-room. This economic lo-fi setup was, in effect, all that was needed to run *Bla Bla*'s entire interactive program every day from 9 pm to 2 am for the full eighteen nights of the deployment. This speaks to the idea that an effective design does not have to be costly and high maintenance if it is well thought out.

Although the basic interaction script consisted of interventions upon the animated images projected on the media façade, it is noteworthy that the device used to achieve this – that is, the stationary luminous plinth itself – responded to user input by lighting up and creating its own content: the luminous intensity and color schemes of the plinth varied and flickered in response to how users touched the trackpad. As a result, the public space deployment of *Bla Bla* highlights two interactive objects: the video projection *and* a site-specifically designed new media urban furniture.

Further, three form factors of this artifact evoke a campfire scene. First, the fact that the luminous plinth is fixed means that users must go to it, rather than freely move around as one would when using a mobile phone to interact. Second, its shape and size, not only enable, but also invite people to gather around it; people must get close to the plinth to access the modest size trackpad. As Figure 3.14 shows, it can accommodate many people at once, either around the trackpad or within the installation space. The elevated square podium platform underneath the plinth further helps to create the illusion of what Frank Lloyd Wright called "a room within a room" that produces an impression of intimacy or enclosure (McCarter, 1997, p. 47). Third, its luminosity functions as what Hornecker, Marshall and Rogers (2007) call an entry point since it captures attention and draws people in (p. 331). These three aspects of *Bla Bla*'s input interface help create

favorable conditions for people to socially interact and possibly eventually cooperate as well. As a kind of electronic campfire, it tends to support the kind of relational approach that Social NUIs strive to induce. What happens when an entire district aspires to become an urban campfire of sorts? What imaginings can such a design goal produce?

3.3.3. From Percept to Concept: Design for Explicit and Implicit Interactions

Before the *Digital Pathway* – in the early days of the *Luminous Pathway* – *Integral*'s team looked to enact design strategies that would visually connect the different media façades and cultural venues together in order to visually brand, at once, the Quartier des Spectacles in its integrity, as a site of art and culture. The concept was ambitious: to provide a unified impression of elements dispersed within a territory that spanned one square-kilometer. For all intents and purposes, it was more conceptual than practicable, for no vantage point on the ground would allow an observer to take in this impression. Only a bird's eye view of the whole district in Figure 3.4 seen from high above would afford the possibility of visually perceiving what the designers had conceived of, but the trade-off is that it would not provide a detailed view of the façades.

> The lighting plan's third stage makes its very distinctive: the moment when it is revealed that the spaces are connected as a network. It acts as a clock, striking on the hour or half-hour. Places become brighter before blending into one color to announce and emphasize that they exist in one district. (Jean Beaudoin qtd in Quartier des Spectacles, 2010,~2min17sec)

It is noteworthy that this design intention could only be rendered intelligibly in a promotional video produced by the Partnership in which one can see a montage of images, which seems to achieve this effect while the designers' voice-over explains how it works. In fine arts theory and praxis, it is not only acceptable, but it is also common practice to begin a formal inquiry by considering impossible, idealized concepts to inspire new design approaches and forms. For instance, many of Buckminster Fuller's utopic architectural visions were not practicable, but they provided fertile ground for generations of architects to think innovatively about space, movement and design. Similarly, new media allows designers to imagine ways of experiencing time and space that may have been unthinkable before electronic tools became available. With this in

mind, it is interesting to reflect on the third stage of the Quartier des Spectacles' lighting plan as proposed by *Integral*. What were the designers trying to achieve? Does their concept not propose to collapse space the way online telepresence does, that is, simultaneously being present in more than one location? Or is their concept attending to forms of cognitive presence that emphasize taking in multiple attention foci at once?

It seems that the fundamental design problem that *Integral* was trying to resolve was how to create a sense of place by connecting people to several media façades – each situated in different locations – as one. Computational technology can assist in operating and precisely synchronizing these different media façades, and in this sense, they can integrate them all in a single understanding of a *designed place*. But the output was visual and implemented in a model of space that no human eye and no vantage point could perceive without mediated representations produced by more screens streaming live video recordings at a distance. Consequently, the problem they raise here is far more challenging because it is not about what new media can and cannot do, or what concepts it can express, but rather, it is about what one is able to perceive and make sense of. And how designers reconcile all these elements? Indeed, the following describes two examples of practice that seems to more successfully integrate percepts and concepts, as well as multiple elements that transform a space into a designed place.

How to Melt an Iceberg or Implicit Interaction At-a-Distance

Digital displays can be static or dynamic, but most interactive displays are necessarily dynamic by design. As previously discussed, there are certain form factors that displays tend to come in, but many artists showcasing their work in the Quartier des Spectacles have pushed the boundaries of what forms a dynamic display can take. One could argue that this is the case of *Iceberg*, an interactive installation deployed in the Place des Festivals (the location indicated by placemarker E in Figure 3.4) and on the Esplanade de la Place des Arts (the location indicated by placemarker F in Figure 3.4), from December 6, 2012 to February 3, 2013, six months after the *Digital Pathway*. This installation has no screen but it does call into question what constitutes a display in the way that James Turrell's work does: is a display an artifact that produces light to create ambient content? Once again, this may serve as a reminder that the common denominator of content in all digital displays is that it is always made up of light.

Iceberg is an installation that comprises seven different structures of human scale, each made up of a series of parallel metal arches that emit a cold blue light when they are in repose. As seen in Figure 3.15, every time people walk underneath the tunnels of luminous arches, the color of this lighting slowly begins to shift towards warmer hues until it becomes red. The installation also comes with a soundscape that reproduces ambient sounds originally recorded in the far north. As the arches display warmer tones, the ambient sounds change tonality. Then, the sound of water leaking into puddles fades in and accelerates. The conceptual message is that human activity is warming up the icebergs in extreme northern climates and by extension, the planet.

To summarize, the input data consists solely of variations caused by the motion of bodies inside the arches as captured by sensors, while the output is both light and sound. Consequently, the data being generated by *Iceberg* is simple and accessible to everyone – young and old – as it consists of changing impressions that appeal to these two senses. The installation foregrounds interactive content that is *explicit* in that it is clear, direct, definite and fully perceptible without the need for further interpretation or translation. However, as discussed earlier in this chapter, artists often use techniques such as association and metaphor to evoke *implicit* content that is not plainly expressed, but is inferred from what is explicitly perceptible. This doctoral dissertation argues that it is in the way that artists create the relationship between explicit content (percepts) and implicit content (concepts) that art stands to gain in complexity and meaning. In the context of interactive art, this process can be built directly into the interactions, which ostensibly enriches the user's sense of agency and possibilities for self-expression.

As is often the case in contemporary art, in *Iceberg*, the implicit content is conceptual. The appearance of warmer tones and the acceleration of the water drops are meant to evoke "the life cycle of an iceberg from calving to eventual melting…varying with the presence and behaviour of people…inside the structures" (Quartier des Spectacles, 2015, p. 11). Not only is this implicit content a mental representation, but it is also one that refers to an entirely different location, namely the far north, for there is no iceberg in Montréal. The function of this design must also then be to imply that a phenomenon is taking place in an altogether different location than the

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one where the interactions are happening, and thus symbolically connect the interactant to this place, while also suggesting a link between both the explicit and implicit locations.

As has often been said, new media has the capacity to collapse space and generate action-at-a-distance (McQuire, 2008, p. 4). But rather than use this affordance, the designers of *Iceberg* chose to use new media to *evoke* the idea of action-at-a-distance by using visual and musical metaphors that come in the form of sensory impressions. The implicit message is that human activity has a direct and powerful effect on the environment, an idea that many practitioners have been taking up in art and design to spur reflections on the Anthropocene thesis "which states that humans have entered a new geological epoch defined by the visible and lasting effects of human activity on all aspects of the environment" (Anderson, 2015, p. 338). *Iceberg* does not suggest an ideological stance on the issue of climate change. Instead, it implies three ideas: that most natural phenomena manifest as a cycle; that human activity can have an effect on the natural environment; that a human action that is locally situated can have consequences in a remote location, as the artwork's description suggests:

> Unique soundscapes accompany the iceberg's slow progress to temperate waters. Sampled in the far north, the natural sounds triggered by human activity under the arches grow richer and more harmonious as visitors progress through the work. As the iceberg gets nearer to inhabited shores, music emerges. Human activity transforms the piece's original form until a climax is reached. Warmed by human presence, *Iceberg* grows reddish and we hear it collapse on itself. (Quartier des Spectacles, 2015, p. 11)

While *Iceberg* uses explicit and implicit interactions to evoke the collapse of time and space, the next installation works toward consolidating real space with real time to create a designed place, or, as Lloyd Wright used to say: "a room within a room".

Implicitly Reconnecting Real Space with Real Time Within the MindWind

An interactive installation designed by Herman Kolgen, *MindWind* proposes a new spin on location data mining. Rather than create surveillance profiles that analyze people's consumption habits in the city, he uses natural user interfaces to capture data from the ambient environment in order to create interactive visualizations, soundscapes or multimodal installations. In this sense, Kolgen recontextualizes and remediates

environmental elements such as wind or ambient noise. *MindWind* – the architectural-scale media façade shown in Figure 3.16 – was designed to react to ambient urban noise. Located at the emplacement indicated by placemarker 8 in Figure 3.4, this location is the Quartier des Spectacles' only modular media façade in that it is composed of two separate planes at different depths in space. The plant projected on the right-hand media façade appears to grow and react in real time according to the noise level picked up by microphones placed in the neighborhood, while another video loop, also triggered by the same data input, shows, on the left-hand media façade, a full shot of a woman whose dress skirts gets ruffled by the wind blowing toward her. Interactivity is simply the result of variations in ambient noise.

By making the organic life represented on the façades move slower or faster, the speed of the playback thus serves as an index of human presence and activity that takes place in the immediate environment. Kolgen explains his design rationale in these terms:

> I use elements that are part of our everyday environment – such as dust and wind – to reconnect people to their sense of place through tactility and embodied sensory impressions. (H. Kolgen, interview, 5 April 2013, notes)

Kolgen's interaction strategy does not create explicit interactions between people, but instead, it implicitly binds them together in a shared space by aggregating data that they are individually generating, often without even being aware of it. Differences between explicit *vs.* implicit interactions will be further discussed in Chapter Six, but for now, suffice to say that this difference can operate on several levels at once. For instance, the noise produced by human activity is implicitly evoked in the video projections by the different speeds at which the plant can explicitly be seen to grow and the wind explicitly appears to blow. *What is not seen* is what ultimately produces variations of meaning in this particular installation: a sense that an invisible force makes life forms manifest in the neighborhood. Indeed, this "invisible force" is sound.

Originally, Kolgen had also envisioned using the wind factor for emergent interactivity. When a breeze would blow, rustling the leaves of the trees planted on the ground below the modular dynamic digital displays, the pleats of the woman's skirts would have stirred while the green leaves of the plants projected on the adjoining façade

on the right would have become more animated (H. Kolgen, interview, 5 April 2013, notes). Crossmodal interactivity would have occurred in many ways to produce visual outputs: first, as a result of variations in ambient noise (sound input); second, in reaction to the motion of the wind (haptic input). As a result, two "invisible natural forces" acting on the environment would have been visually represented in real time to create a sensory experience that shifts to and fro from the visual to other senses, from the explicit to the implicit. *MindWind* illustrates this doctoral dissertation's previous discussion on how new media can support art's long-standing tradition of using crossmodal perception as a means to awaken and evoke new meanings.

This suggests that when it comes to public interaction, interactivity may need to be more broadly defined than in scenarios where end users simply interact online or alone through a device. Yet, the *Digital Pathway* deployments showed that electronic artists like to keep the mechanisms by which interactivity is enacted as simple as possible: lo-fi equipment supporting programs that can run with a few scripts lines. Kolgen's use of a short video loop that plays back at variating speeds may be a somewhat basic way of implementing interactivity but it nonetheless can be very effective in creating evocative effects or the illusion that a moving image is producing emergent content. For this reason, it is often used as an interaction design strategy for media façades and digital displays, as the example of practice in the next section shows.

3.3.4.   It Takes a Village: Design for Cooperation

When it comes to the study of digital display systems, Müller, Alt, Michelis and Schmidt (2008) argue that understanding how to motivate interactions is a major issue that remains far too understudied (p. 1287); the authors break down this HCI factor into the following categories: challenge and control; curiosity and exploration; choice; fantasy and metaphor; and collaboration (pp. 1287-1288). The thrust of this framework is aligned with observations made of some of the artifacts deployed during the *Digital Pathway*. Indeed, offering a challenge with an opportunity to collaborate in taking up this challenge is an interaction design strategy that can create a context for public interaction. For instance, some artists created input and output interfaces that rewarded cooperation

between multiples users. These did not simply constitute shareable interfaces: they were collaborative systems. The following illustrates this with two examples of practice.

Rewarding Group Interaction By Means of a Sigh

Jean Dubois and Chloé Lefebvre's *By Means of a Sigh* is another interactive display-based artwork that relied on the use of personal mobile devices for input. This interactive video was showcased on an oversized digital display situated outside the Place des Arts building on Ste-Catherine Street, near Jeanne-Mance at the location indicated by placemarker B in Figure 3.4. This was one of the rare *Digital Pathway* deployments implemented on an actual LED screen – of an imposing size but placed at ground level – instead of a video projection on a media façade.

Dubois has often used an anemometer to design interactions around his art installations. An anemometer is a device that measures the force emitted by wind or air pressure to generate data. In Dubois's *Brainstorm* installation, for instance, when someone blows into the anemometer, the words projected on the screen begin to move faster and away from one another, creating the illusion that one's breathing can disperse them. *By Means of a Sigh* similarly uses breathing as the input signal that triggers interactivity. Filmed and edited prior to deployment, this artwork simply consists of a video loop of a lateral view of a woman and a man facing each other as they each blow bubble gum; the thinning walls of their bubbles touch and eventually burst as they increase in volume.

Interactants can help blow the bubbles by calling a telephone number that connects them to the screen. Figure 3.17 shows how they can then gather around the screen and exhale into their mobile phone to move the video projection forward at a speed consistent with the intensity of their breathing. If no one blows air into their mobile phone, the playback slows down or almost stalls, creating the impression that the balloon is deflating. If many people blow intensely and steadily, the balloon inflates fast until it bursts, causing the video to loop back to the beginning again.

Practically, this means that when people work together, they can synergetically influence the outcome. Although the input interface is small in that it is typically the size

of a mobile phone, the application has been fine-tuned so that when the number of people who blow increases, the interaction appears more effective, and thus visually rewarding. The artists' stated intention was to tie the intimacy of embodied experience to the art installation:

> Being able to use one's breath to modify a big image, much larger in scale than one's own body, is a sensory experience that can give people a feeling of personal empowerment. We were concerned with finding ways of making interactive works that included interactants' bodies as part of the art piece because when we interact with an artwork, we become a part of it. The underlying rationale for this is not only aesthetic but also political. It's too easy to watch art and be contemplative. We can just stand there and criticize everything. But when we interact with an artwork, it's much harder to be critical, or at least, we are not critical in the same way because we are now engaged in this work, we have become a part of it. In this way, interactive public art is a tool that can activate public space and create conditions that connect people to it and to each other. (J. Dubois, interview, 18 April 2013, notes)

Although here, the art seems to be more about a process than an object, the physical and conceptual design of the interface determines the experience and value of the interactions. In this sense, the artwork attends to similar goals as Social NUIs by refocusing interactions on collaboration, play and meaning: at the end of the day, it may take a village to burst these bubbles. Further, the artists' stated socio-political agenda suggests that a Social NUI can also include a political or civic purpose:

> It was not without significance that breathing was the strategy used to interact with urban screens of commanding scale, especially considering that the input interface – personal mobile devices that have become increasingly part of our everyday – are of miniature size in comparison. Indeed, this interaction modality makes manifest an invisible, but vital connection between individuals and the civic infrastructures that surround them. Breathing is probably one of the most inconspicuous acts that all of us do day and night. Although the reach of one's breathing spans no more than a few centimeters, it nevertheless circumscribes the boundaries of our physical privacy. Giving one person's breathing architectural magnitude works to challenge preconceived ideas about how authority and agency conventionally play out between individuals and institutions.

> Beyond creating a user-friendly context for playful interactions, the artwork also aims to suggest that we, as individuals, need not only be the spectators of monumental public art. By interacting with these works, we are meant to become aware that their overpowering presence in public

space carries a great deal of political weight. Breathing as an interaction modality is proposed here as a means to reclaim the dignity and nobility of the subject's body in the city by temporarily reversing the power imbalance between its modest scale in reference to the imposing stateliness of the *polis*. (J. Dubois, interview, 18 April 2013, notes)

Twenty-One Swings are Better Than One

Conceived by two Montréal-based interaction designers, *Daily Tous les Jours*' Mouna Andraos and Melissa Mongiat, *Twenty-One Swings*, shown in Figure 3.18, is arguably one of the Quartier des Spectacles' most popular deployments. Each swing is programmed to emit its own distinctive range of notes that either reproduces the sound of a harp, a piano, a vibraphone or a guitar, depending on the swing. How high one swings determines the musical note that is played. Whenever more than one swing is being used, the composition layers of sound generate their own unique melody. As a result, emergent musical compositions are produced each time there are multiple users. Further, if the vertical coordinates of at least two of the swings perfectly synchronize, a special tune would play over the musical composition to reward interactants for swinging together.

Deployed on the Promenade des artistes in front of the Place-des-Arts subway station public transportation hub at the location indicated by placemarker G in Figure 3.4, the swings are often used by people waiting for the bus. Interactants don't necessarily talk to each other, but they do collaboratively make music together. One day, a homeless man was swinging next to young people; he was enjoying himself so much that he began to enthusiastically improvise his own melody over the musical notes played by the swings. He sang completely out-of-tune with the melody played by the installation as a whole. People lining up for the bus seemed bemused, but there was a sense of civic life, of people sharing a space and a moment that was just about being there and being part of something together. Something that was just what it was. If interactive public space technology could enable more playful and respectful public interaction, might we see changes in how people relate to one another socially? Might the relational qualities of these works even play a role in meaningful social change beyond the public spaces they are deployed in?

At times harmonious and at times cacophonic, *Twenty-One Swings* is a collaborative musical instrument that provokes and proposes new forms of social intercourse in public space. It is noteworthy that the entry point for motivating interaction is neither a challenge, nor a need to cooperate, but both are rewarded. This offers end users the freedom to choose. And indeed, Müller, Alt, Michelis and Schmidt's (2008) motivation framework notably includes the notion of "choice" (p. 1288).

Moreover, of particular interest to this design research dissertation is that, much like *Bla Bla* has its luminous plinth, *Twenty-One Swings* has its luminous seats, which create accent lighting in the installation at night. This design feature seems to be used to draw attention to the seats and single them out as being the input interface or a site of interactivity. Expounding on his ecological approach to visual perception, Gibson's (1966) writings on *phototropism* and *photokinesis* describe how people are attracted to light and learn to move in relation to it (pp. 13, 73); Gibson might attribute this design conceit to those human factors. Indeed, light seems to be a recurring motif in the vocabulary of technology design: whether we think of how tangible objects light up or how digital displays of all sizes tend to dominate when it comes to user interfaces. The next subsection purports that crossmodality often foregrounds light and visual content.

3.3.5. Beyond the Vision Paradigm: Design for Multimodal Content

In the past decade, the term *embodied interaction* has been widely used in HCI research to describe a holistic "approach to the design and analysis of interaction that takes embodiment to be central to, even constitutive of, the whole phenomenon" (Dourish 2001, p. 102). Yet, when one considers that the majority of applications and devices are vision-based, or place the design emphasis on vision, does this concept not seem like a misnomer? How embodied are vision-biased computational technologies of representation? It may be that the full potential of display design will only be unleashed when practitioners go beyond the vision paradigm, but until now, it is this sensory modality that dominates screen-based systems. Enns (2004) writes that the main pursuit of HCI is "to use research in human vision and visual cognition to improve the two-way communication between humans and machines" (p. 22).

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This bias may be due to the fact that "of the six sensory systems that most humans share (vision, audition, touch, taste, smell, and balance) vision is the sense that we as modern beings rely on most of all [*sic*]" (Enns, 2004, p. 4). Whether or not visual perception is the sense most used, what is relevant here is that it is often cited as the dominant sensory modality of our age, because, as scientists argue, it has been more studied than the other senses and is ostensibly more efficient than other senses at perceiving impressions at a distance (p. 14), it is intrinsically linked to thinking through the faculty of imagination (p. 13) and current neuroscience has suggested that it is directly related to the development of awareness and consciousness, and by extension of a sense of identity (p. 359). Displays, by definition, are of course made to be looked at, but the design issue raised here is how can other sensory modalities augment vision or compete with it in the context of large digital public displays. The next examples of practice discuss how adding sensory modalities helps to motivate interactions and produce more physically intuitive and immersive experiences.

Twenty-One Obstacles Set in Motion by Twenty-One Swings

When the *Twenty-One Swings* were deployed during the *Digital Pathway* in 2012, the designers connected them to the monumental *Twenty-One Obstacles* media façade in order to provide more possibilities for human-computer interaction: swing motion would then generate both audio output (by producing music) and visual output (by moving objects on the façade). Shown in Figure 3.19, this installation deployed at the location indicated by placemarker 1 in Figure 3.4 functions much like a pinball machine. Anyone with a cell phone can text in a message that throws a new ball into the display space. Each obstacle is powered by one person's swinging. When the ball hits an obstacle on its trajectory, it produces a visual effect, and then the ball continues its course. The result is a colorful and dynamic canvas of geometric obstacles that chaotically collide into one other on the media façade of UQAM's President-Kennedy building, a monumental display which covers a total area of 105 metre x 29 metre.

This installation is a good example of how displays can shift their focus beyond the vision paradigm and become part of a larger interactive multimodal environment. Here, sound and motion are just as much the results of actions and take up as much importance in creating impressions as visuals. This dissertation argues that when vision-

based output is less dominant and better integrated – as in *MindWind* – the display becomes more embedded in the setting and a stronger sense of place results. *Twenty-One Swings* has since become a perennial installation deployed every spring for a month in the Quartier des Spectacles. The interaction designers behind this installation have received commissions from all over the world to manufacture their swings, which suggests that municipal governments may be interested in using smart technology for purposes other than just data mining. Perhaps design thinking that strives to achieve a better balance between many sensory modalities might be one of the promising approach to building cities of the future.

Voice-based Interactions through the Mégaphone

Another possible orientation for the design of interactive display technology that goes beyond the vision paradigm is to use displays as a platform that supports another sensory modality that dominates over visual content. *Twenty-One Obstacles* is an example of how a display can achieve this in tandem with motion-based interfaces, in this case, swings. But there are other emerging interaction paradigms such as the *internet-of-things* (Jenson, 2014), *material interactions* (Wiberg et al., 2012), *proxemic interaction* (Greenberg et al., 2011) and *gesture-based interaction* (Grace et al., 2013) that present new possibilities for design. In particular, with speech recognition software quickly becoming more efficient and available, there is a whole new interaction modality that could be a game changer in public space, namely *voice-based interactions* (Whittle et al., 2010). At the time of writing, there are large public display systems that are being designed to analyze speech input when people talk in proximity of them, with some displays responding to voice. One such installation is Mégaphone seen in Figure 3.20.

This interactive public art installation deployed in 2013 in Montréal's Promenade des artistes at the location indicated by placemarker 1 and G in Figure 3.4 might be described as a giant sandbox for people to interact with each other in real time and in public space with technology as a catalyst and an amplifier. Of all the digital experiments surveyed in the Quartier des Spectacles since its establishment, none seemed more promising as a source of inspiration for new forms of public interaction than Mégaphone. In fact, the data collected during a ten week qualitative evaluation of this artifact was so rich that it produced several unexpected uses for display systems and thus provided

grounded evidence that alternative forms of public interaction can be foregrounded in the context of studies conducted in-the-wild where "the locus of control shifts from the experimenter to the participant" (Rogers 2011, pp. 58-59). This suggests that end users can contribute valuable knowledge about the needed *functions* of interactive display-based technologies. In addition, field observations over ten weeks provided a grounded basis for reflecting on a framework of social affordances specific to public interaction. Mégaphone seemed to be the ultimate Social NUI in that it was a technology that created and re-created relational contexts. But it was also a study model of a Social NUI tailored for public space. The next three chapters are dedicated to its empirical study.

Chapter 4.

Mégaphone or the Interactive Body Politic

This public sphere will only come into being if there are complex forms of interaction, of participation and learning, that use the technological possibilities of the networks and that allow for new and creative forms of becoming visible, becoming present, becoming active, in short, of becoming public. (Andreas Broeckmann, 2004, p. 379)

From September 4 to November 4, 2013, Mégaphone, a digital public art installation was deployed outdoors over ten consecutive weeks on the Quartier des Spectacles most imposing media façade, located one block north-east of the Place des Festivals. Co-produced by the Quartier des Spectacles Partnership and the Québec-based NFB Interactive French Program Digital Studio, this interactive system was conceived by Étienne Paquette and designed by a creative team of ten people led by Alexandre Lupien, the chief technology designer of this project at Moment Factory.

The three chapters that follow report on the 3-month qualitative field study of Mégaphone. While the previous chapter gave an account of phase one of this doctoral fieldwork, this, and the next two chapters, describe phase two in detail. The distinction between the two phases is that whereas the former presented a survey of a number of interactive artifacts deployed in a site covering many public spaces, the latter focuses on the study of a single artifact in a well-defined plaza. Other than this, there is a very clear demarcation point between phase one and phase two: while it was I who initiated and conducted phase one research, it was the expert stakeholders who asked me to conduct the Mégaphone research in collaboration with them. By slowly venturing into a site where the difference between non-participant and participant observer may seem fuzzy, the ethnographer has the possibility of building relationships that create a context where they are invited to participate in research produced through collaborative methodologies.

4.1. Genesis of an Interactive Digital Soapbox

In early 2012, Montréal became the theatre of the political and social awakening of its Millennial generation and hundreds of thousands of citizens during months of unrelenting street protests, which will be historically remembered as the Maple Spring. Originally triggered by opposition to hikes in tuition fees in the province's universities, the daily demonstrations rapidly transformed into a full-fledged social movement of global proportions when trade unionists, feminist activists, diverse minority groups and citizens from all walks of life rallied behind student protesters in support of the broader cause of social, political and economic justice – not only in the province, but all around the world (Taylor, 2012, p. 7). The Maple Spring has been called "the largest act of civil disobedience in Canadian history" (Goodman, 2012, para. 24) and one of the worse examples of repressive state measures against a social protest movement according to Canadian political economist, Vincent Mosco, who commented to the press: "I don't know that a government in North America has done a worse job in handling and addressing the issues and the people than in Quebec [*sic*]" (Tousignant, 2012, para. 23).

Mégaphone is one of the legacies of this social movement. This unique technological artifact was designed in response to a call for projects issued by the National Film Board of Canada and the Quartier des Spectacles Partnership in the midst of the Maple Spring uprisings; In April 2012, local artists and multimedia production companies from diverse fields – newly emerging or with a long track record – were invited to submit a concept for a public art installation that would enable end users to express their personal sense of identity within the culture of the city and the larger fabric of Québec society; It would be a means to suture back the individual with the social.

Five months later, in September 2012, the collaborative partnership that co-produced this public commission announced that Mégaphone, a project imagined by Moment Factory, had been selected as the winner in this competition (National Film Board of Canada & the Quartier des Spectacles Partnership, 2013). According to the producers, the Mégaphone proposal stood out because of its relevance and originality. Beyond its formal qualities, Mégaphone was chosen by the jury for its provocative urban theme: on the heels of the civil rights *débâcle* that unfolded during the Maple Spring, it

would provide city dwellers with an opportunity to reinvest and reclaim public space, but this time, by playfully practicing the art of public speaking with one another.

4.1.1.   The Speakers' Corner

The artists behind Mégaphone largely drew their inspiration from two Western traditions of oratory that both emerged in the nineteenth-century. The first is firmly rooted in the history of Commonwealth countries – especially England and Australia – where the practice of soap-boxing gave rise to the Speakers' Corners still found today in London's Hyde Park and Sydney's Domain. Given the medium-specific properties of new media, however, Moment Factory's twenty-first century version of the soap-box supported a higher level of complexity than would an analogue public address system: it afforded a wider range of expressive capabilities and it was made to be interactive.

Paquette, a post-graduate in Communications and the conceptual mind behind the project explains its design in these terms in Mégaphone's promotional documents:

> We have never had so many ways of expressing ourselves. Why, then, one more soapbox? Because speaking out in person, when you are surrounded by other people in the middle of the city, is not just another way of conveying information. It's a different kind of human experience – multisensory in a deep way, dynamic, powerful, sensual. Speaking out in public is the opposite of being well-behaved. It's intense, crazy, disturbing, and it gets you involved. (Paquette qtd in National Film Board of Canada, 2013a, p. 6)

While some are poised to compare Mégaphone to the Canadian *Speakers' Corner* television series that aired on CityTv television stations from 1990 to 2008, newspaper articles on the latter and this study's *post hoc* interviews conducted with interviewees who had used both installations suggest that these are substantially different technologies. The fact that both are referred to as a "speaker's corner" is likely what has caused some degree of confusion. In fact, the CityTv *Speakers' Corner* is a weekly broadcast that has been described as an experiment in interactive broadcasting anticipating the YouTube™ platform (Riddell, 2014). The main difference between interventions at Mégaphone and the *Speakers' Corner* television series is that the former take place in an agora which supports live public interaction while the latter are

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individually recorded with somewhat more intimacy in an open or closed-off video booth to be subsequently curated and edited for broadcast on television. Differently put, the context for public interaction is radically different: Mégaphone's engages publics in real time in a real-world environment, while CityTv *Speakers' Corner* addresses a television audience or online publics in deferred time on a platform that is virtual. While it is true that both can make use of real space and virtual space, each has a design and function that structurally emphasizes one over the other.

The main topic of this doctoral dissertation is live public interaction as opposed to online public interaction. This is, in fact, why Mégaphone served as the primary case study: it digitally augments people in public space. By contrast, CityTv *Speakers' Corner* does not support live public interaction because it has no agora and it does not allow more than a handful of people to watch when someone talks to the video camera and display, which are usually situated in a small booth. For this reason, it did not seem relevant to discuss CityTv *Speakers' Corner* in great detail in relation to this research or to use it as a basis for comparison. As Figure 2.7 suggests, this doctoral research was framed by the idea that people could choose to enact different "levels of engagement" in public space. Thus, this dissertation's understanding of what constitutes live public interaction has its own historical roots that far predate the history of television broadcasting. During the two-hour interview that was conducted with Paquette for this research, he discussed in great detail the genesis of Mégaphone in this particular context of public interaction which goes back to the eighteenth century:

> What we are currently seeing with Internet is that it is increasingly being proclaimed as the new public sphere, a space in which issues can be debated, liked and critically discussed. This is certainly in alignment with the Habermasian view of communicative action that is well-informed and rational, but because it is taking place in a controlled virtual space, it is not only disembodied, it actually brackets the body out of the speech act to produce a sphere of 'floating ideas'.

> It was my impression that many people have come to think that this may be a better way of participating in political debates, perhaps because the physical body is understood as a threatening instrument, one that inevitably leads to political agitation or social violence. However, one must remember that the body is also the seat of emotional and social intelligence. Detached from it, an idea remains but an abstraction. I believe, for this reason, that an idea disembodied from the speech act

may be far more dangerous because it lies outside the realm of lived human experience, and thus is ultimately already dissociated from reality.

With Mégaphone, we wanted to reinstate ideas into civic life by supporting the embodied speech act in the city proper – the way it is done, for instance, in a "Speakers' Corner". Talking about political issues while you are in real public space has a different impact than commenting online. Corporeal presence carries its own set of implications because *being there* is a political act in and of itself: it connects the public sphere to the public realm. Dangerous or not, it necessarily redefines what is the body politic by restoring into it the presence of individual, political bodies. (É. Paquette, interview, 26 August 2013,~35min).

Academic disciplines such as political economy (Mosco, 2009, p. 10) and anthropology (Ingold, 2014, p. 393), to name a few, are primarily concerned with producing knowledge that place greater emphasis on studying and understanding how the reality of lived experience constitutes forms of consciousness, cultural practices and social structures. Paquette's comments suggest that online technology-mediated social participation (TMSP) may accentuate the disjuncture between reality and representation that, according to McQuire (2008), has become the condition of modern life in the media city (p. 4). During his interview, Paquette cited the works of several scholars such as Baudrillard (1993) who argue that technologies of reproduction – especially digital media that supports remediation – have produced new forms of consciousness that are no longer anchored in the real, but are forever caught up in a maelstrom of signs, that endlessly refer to one another to produce an effect dubbed *hyperreality* (p. 71-72).

Paquette saw in Mégaphone the possibility of using digital technology to reverse this process. During the interview, he suggested that technology design could either widen or narrow the gap between the real and the imagined. As an example of how this could impact human consciousness, he mentioned applications that allow people to vote online during elections, and asked: "How important is it for people to be physically present when they are casting a vote? Is embodiment a political gesture? What does having to physically travel all the way to the polling station change in the political process?" (É. Paquette, interview, 26 August 2013,~1h14min). Drawing on Foucault's work, he wagered that using technology to reintroduce the presence of the physical body into discursive practices might offer a way to address the dichotomy between the material and the conceptual aspects of the online public sphere. While Paquette's

notions of embodiment were informed by soap-boxing, his understanding of public interaction was derived from earlier research in Québec's political history.

4.1.2.   Political Assemblies in Public Space

Paquette explained that his primary source for the making of Mégaphone was a second tradition of public speaking, one that was much closer to his own cultural references, namely Montréal's controversial history of people's political assemblies and their celebrated public orators, such as the four-time mayor of Montréal, Camillien Houde, one of Québec's most colorful figures, who came to serve at all three levels of government in his lifetime. According to Paquette, populist agitation and physical confrontation were customary in political assemblies often held outdoors. Houde, the first politician in Québec who came from a working-class neighborhood, understood this *milieu* better than most. He used oratory to win the people's support, but also to elevate political discourse by sublimating crowd violence into creative play. Houde was so notorious for his sense of humor and mastery of crowds that people would travel from far away to watch him transform political assemblies into vaudevillesque spectacles.

Paquette claims that Houde sometimes deliberately staged *interactive* public addresses to divert crowds from violent disputes. For instance, he once gave a speech in Sorel – a working-class city that, at the time, was considered a sulphurous hotbed of political tensions in Québec. The crowd was so clamorous that Houde could barely get a word in on stage. Hence, he took it upon himself to pronounce only a few words and then let the audience finish every one of his sentences that evening. If people made the wrong choice of words, he would shake his head and groan until they found the right ones. People took the bait and laughter quickly defused any potential for violence. By using this public interaction strategy, he led the crowd to deliver his whole speech.

Paquette believes that by focusing people's attention on actively participating in the articulation of ideas rather than passively listening to them, the effect of Houde's strategy may have been to foster relationships rather than to promote his ideas. In Paquette's view, the political messages that Houde had travelled to convey may not have been new or foreign to the people of Sorel. Indeed, the seeds of these ideas likely

existed amongst individuals who were present and in the collective imagination. Using such a playful form of public interaction in political assemblies meant that public speaking was no longer about imposing ideas: it was about *exposing* them. Further, as Paquette remarks, the logic of this strategy is that "if we all play together for long enough in a given space, somehow we will all end up being a member of the same league, even if we are not on the same team" (É. Paquette, interview, 26 August 2013,~20min).

Here, Paquette's assumption was that when the public sphere is a physical space and when it is designed like a playing field, it can encourage individual expression *and* team spirit. This became one of the key rationales behind Mégaphone. Paquette wanted to substitute rhetorical representation with a ludic approach to communication:

> Because the speech act is a relational act, I thought it was important to demonstrate that physical bodies in public space do not necessarily imply violence or a negative outcome – although granted that the potential for these is always present. Based on the research I had done on Houde and the history of political assemblies in Québec, I knew that this energy could be sublimated through theatrical expression: not the theatre of representation, but theatre as a form of play. While the former is the mediation of the self through dramatic performance, the latter is the expression of the self through physical exertions that are creative, playful and not so much driven by a need to persuade.

> It was for this reason that we designed the programming of Mégaphone as a venue that could be, on the one hand, used to deliver a public address, and on the other hand, completely open to experimenting with other forms of expression. We did this because we were concerned that promoting the installation as a space dedicated to political speaking would be far too restrictive. By including comedy, rap, theatrical play and all kinds of creative discourses into the mix, we were trying to challenge the definition of what constitutes a political speech act.

> Although our objective was to create a tool that would support the transmission of ideas in public space, Alex [Lupien] and I were very clear about our intentions: the forms that these ideas would take should not necessarily be of a conceptual or abstract nature. We wanted to encourage as wide a range of expressive forms as possible: our design baseline was that even a young child should be able to use the installation to play. (É. Paquette, interview, 26 August 2013,~1h00min)

It is noteworthy that technology design was not the only factor that would make this possible; to this effect, the collaborative partnership that coproduced the public art installation also had to build and maintain a website that would, on the one hand, make

the updated programming schedule available to the general public, and on the other hand, allow anyone to reserve a one-hour long session at Mégaphone. This website was webcast on July 11, 2013 (National Film Board of Canada, 2013b, para. 8). In the weeks leading up to the launch of Mégaphone, different activist groups, performance artists, poets, intellectuals, journalists and students filled up the schedule. The remaining empty time slots became "open mike" sessions by default. Field observations showed that this was generally when the potential of free play – the transmission of ideas in expressive forms that transcend words – was most unleashed.

Consequently, open mike sessions saw a rich spectrum of uses of Mégaphone. People could either accidently walk into the installation space during open mike sessions, or else check online to see which time slots appeared blank on the schedule. Encouraged by the onsite moderator, people would approach the "Speakers' Corner", awkwardly try out the mike and experiment with what they could do with the voice amplification system. But more importantly, they would be intrigued by how the speech recognition software would display their words on the media façades.

4.1.3.   Designing a Back Door For Appropriation

When we first interviewed the technology designer – a mere week into the Mégaphone deployment – he explained that he had indeed approached the design process by anticipating that some people might prefer to have fun with the system rather than use it as digitally-augmented "Speakers' Corner"; they had to think of ways of making Mégaphone sufficiently open, accessible and pliant to accommodate the needs of not just one, but of as many other possible uses (A. Lupien, interview, 13 September 2013,~14min). In a later interview, he added that because "hacking" is improvised by the user, it cannot, by definition, be anticipated by the designer and thus designing for appropriation was a process that had implied a strange paradox for the creative team:

> You do not know, and *you should not think that you need to know what the users will do* [emphasis added]. From the designer's point of view, appropriation must be understood as a happy accident. If I know what users will do with the system beforehand, then I will be planning for them to do this, which may end up counterintuitively creating constraints that restrict more than they enable. So the way I see it is that we needed to have a clear algorithm of what we wanted the system to support as our

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baseline, which in this case was a people's agora or traditional "Speakers' Corner", a new media platform where people could come and address their fellow citizens on topics of civic and social relevance.

But above and beyond that, the designers needed to accommodate as many use permutations as possible by creating a flexible system that would make room for other algorithms. In other words, the design had to *give way to unforeseen paths*, the way, for instance, a system can fail once a program runs into an infinite loop [emphasis added]. Except that here, the algorithm is not that of a computer code, but of human behavior. *Human behavior is what the design has to give way to* [emphasis added]. To put it otherwise, code may be generative in the system but, in the broader context of the installation space, it is human behavior that is generative in the sense that the presence of people provides a context to generate data input and unpredictable interactions. For instance, if one person starts to applaud, others will follow. This creates a different kind of input than just voice input into the microphone. (A. Lupien, interview, 7 August 2014,~34min).

Lupien's remarks are consistent with his company's mission statement as it is published on their website and widely known in industry: "Moment Factory is a new media and entertainment studio specialized in the conception and production of multimedia environments combining video, lighting, architecture, sound and special effects to *create remarkable experiences* [emphasis added]" (Moment Factory, n.d.):

With Mégaphone, our design process was not oriented towards designing a multimedia artwork or artifact. Instead, we thought about designing experiences. Let me parse this because I know it can sound confusing: you can design some*thing* that will be used by someone and that's what is implied in a design approach that favors the "form is function" principle, as espoused by the American architect, Louis Sullivan. But then, you can also design an event or happening by imagining what users might feel and experience, which displaces the emphasis away from function towards sensory impressions.

However, bear in mind that focusing on the senses can become highly problematic when you try to apply this idea to a group of users rather than to a single user, seeing as sensory perceptions are entirely subjective. For instance, every individual sees a given color in their own way, and then there is the matter of taste; some people may like impressions that others don't. But paradoxically, this is what can make designing for experiences a dynamic starting point. It is the shared expression of individual-ness within a group that generates a unique path.

You know, I am not keen on using the word interactivity to discuss the design of Mégaphone because it is too broad in the sense that it can refer

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to social interaction, to human-computer interaction, etc. I think that with Mégaphone, the real trigger for interaction is always being mediated by sensory perception. For instance, if I speak into the microphone, I will trigger a white spotlight that shines on me; These refer to sensory impressions, not an interaction. But interactions – like social interactions, for instance – might *derive* from variations in how these perceptions are received by one person in relation to another as everyone is partaking in a live event. In other words, an environment like Mégaphone can bring people together to share a common ground of stimuli, but it is the variations and differences between each person's set of subjective impressions that can motivate people to engage with others. So here, designing for experience is designing for sensory perception [emphasis added]. (A. Lupien, interview, 7 August 2014,~20min)

Together, Paquette and Lupien had established a baseline for the design of Mégaphone: its minimum design requirement was that it had to function as a "Speakers' Corner" set up as an environment that could also support discursive intercourse in public assembly. Above this baseline, a set of assumptions – all of which were endemic to the working philosophy of the design team at Moment Factory – informed the making of Mégaphone. First, the main design objective was to use technology to explore new ways of supporting different levels of engagement and forms of interaction between people in public space. A second goal was to create a responsive multimedia environment that would simply enhance everyday human actions and social interaction (interaction design driven), rather than propose new forms of human-computer interactions that needed to be learned (device driven), an approach typically used at Moment Factory to lower the entry barrier (A. Lupien, interview, 24 July 2014,~17min). In effect, this is similar to the Natural User Interface (NUI) approach, except that – like with Social NUIs – the focus is on people and their behaviors, rather than on devices and their materials. This approach favors creating more organic ways of using existing interfaces instead of trying to design new interfaces; this process reframes, refines and tweaks the context of interaction.

The third objective followed from the second: the installation had to support the performance of "everyday action" in as many ways as possible: there is not just one, but many ways of speaking and listening. And finally fourth, although Mégaphone had to fulfill all the basic requirements of a "Speakers' Corner" and agora space, the designers had to make sure that it would also allow free play and experimentation in order that the installation had the possibility of becoming what users wanted it to be. This meant that

beyond designing for perception, they also had to design for appropriation. Based on the interviews conducted with the designers and producers, these were the original design intentions. How were these abstract principles transposed into material conditions?

4.2. Anatomy of a Design: The Making of Mégaphone

To engineer the high-level design concepts expounded in the previous section into an architectural-scale interactive system, Lupien had to imagine Mégaphone as a multisensory environment that would support much more than just public speaking and listening. His response to this challenge was to create a multimedia installation that would bring people together to partake in new kinds of shared, immersive experiences, from which, he hoped, would emerge circumstantial meanings in *this* public space (A. Lupien, interview, 31 July 2014,~20min). This meant revamping Montréal's Promenade des artistes downtown plaza – which covers an area of roughly 27 metre x 22 metre – into a digitally-augmented agora. It also involved using different interfaces to deliver multimodal content that would, on the one hand, attract people into the installation space, and on the other hand, define its physical and conceptual boundaries (A. Lupien, interview, 7 August 2014,~4min). And of course, the designer had to make sure that the system lent itself to creative appropriation. Accordingly, Mégaphone was designed with multiple input/output interfaces and system components: a microphone, custom-built French/English speech recognition software, an audio patch, a database, eight voice amplification loudspeaker units, two media façades and responsive stage lighting.

4.2.1.   Mégaphone's Single Input Interface

Mégaphone was designed with a single input interface, namely the Shure model 577 Sonobar™ microphone that participants were to use to deliver their public address. Hence, the speaker's voice – and any sound that was captured by the microphone – was the only input that could trigger human-computer interaction. A coiled cable connected the handheld button-activated mouthpiece to a two-metre high pole anchored in the center of the "Speakers' Corner" four metre-wide hexagonally-shaped wooden platform shown in Figure 4.1. A large red funnel-shaped megaphone – chosen as the installation's iconic design element – rested on top of this pole, hovering over speakers

in position during their intervention. Also on the pole, about one and a half metre above ground, were two big plastic buttons that speakers could press to select whether they wanted the speech recognition system to analyze words in the French or in the English language; the brightly lit circle in the center of Figure 4.2 is the French option top button.

At its most basic level, Mégaphone would simply amplify their spoken words throughout the plaza, while a speech recognition system analyzed and transcribed these utterances for graphic visualization on two different media façades. Theoretically, output content mainly appealed to two sensory modalities – sound and vision. But the fact that the system was programmed to respond to voice input in at least four substantially different ways, arguably produced a more complex sensory field, wherein perceptions might intermingle and effect one another in a synergy of experience, a phenomenon Merleau-Ponty (1945) has dubbed "synaesthetic perception" (pp. 273-275). The next subsections describe the system components and architecture that supported this.

4.2.2. Mégaphone's Four Multimodal Responsive Output Interfaces

Mégaphone's voice-activated input triggers four distinct set of output interfaces. Because it simultaneously transduces a single input modality for output into impressions that appeal to more than one sense, it can be said to be a multimodal installation that supports crossmodal interaction. Below is a detailed description of the four set of responsive output interfaces that framed the end users' embodied experience:

- **eight loudspeaker units** offered audio amplification all around the installation space. One unit was discretely hidden into the red funnel-shaped megaphone cone; three units were embedded into the elevated sides of the "Speakers' Corner" wooden platform almost at ground level: the white oval shape on the bottom-right of Figure 4.1 shows one of these; and four units were perched on top of poles 3.6 meters high placed around the agora space, in the locations indicated by blue ovals in Figure 4.3.

- **four VL3000 digital stage lights** programmed to produce two distinct lighting effects, which are activated either by sound input into the microphone or by silence that extends for more than thirty seconds. As shown on the right section of Figure

4.4, these stage lights were hung at a height of six metres above ground from two T-shaped steel columns anchored in modular concrete blocks, each flanking the sides of the master control-room. To protect them from bad weather, they were kept inside clear globe casings from inside which the colour, intensity and direction of the light beam could be remotely adjusted. The pink circles on Figure 4.3 show how they were positioned on an axis fifteen metres in front of the "Speakers' Corner" platform.

- **one small media façade** animated by a single Christie™ projector illuminating a 12 metre x 5 metre surface made up of two industrial shipping containers (12 metre x 2.5 metre x 2.5 metre) painted white and stacked at angles slightly askew from one another. As shown on Figure 4.5, this display was held up by two shorter industrial containers (6 metre x 2.5 metre x 2.5 metre) at each end, situated about five metres behind the "Speakers' Corner" platform with its lowest horizontal border at a height of 2.5 metres above ground. Consequently, it was in full view of people sitting on the benches in the agora, and pedestrians arriving from the east, north or south side as can be seen in Figure 4.3. This small media façade was connected to a speech recognition system, which would display some of the speaker's words in thick white font over a looped black and white video projection depicting a rambunctious crowd, while a thin overlaid red line would appear to be electrically reacting to the amplitude of the speaker's voice in real time.

- **one monumental media façade** that covers a total surface of 105 metre x 29 metre on the street-facing side of *Université du Québec à Montréal*'s President-Kennedy building as seen on Figures 4.4. Illuminated by eight Christie™ projectors covering four abutting sections of equal size – with two overlapping projectors for each section – this façade was far more versatile and responsive to the speaker than the smaller one. Providing graphic visualizations of the spoken word, it publicized topics while they were being debated live in the "Speakers' Corner" and provided a summary of the most recent and frequent topics when the installation was not in use. Visible from many streets away, this was the most imposing output interface. While the microphone can be said to have been the keystone of Mégaphone's design, the monumental media façade could be construed as its cornerstone in that it consolidated the installation space and revealed the system's dual modes.

4.2.3. The Dual Skins of the Monumental Media Façade

Inasmuch as all of its output interfaces worked in synergy to create different layers of sensorial information, the design of Mégaphone far outreached an electrically amplified "Speaker's Corner". Lupien describes how each provided content that mapped out the installation space in a different way, contending that these different types of contents functioned both as boundaries and entry points (A. Lupien, interview, 7 August 2014,~5min30sec). To illustrate what this means in a dissertation is a challenge because words cannot fully render a multimodal interactive experience in real space.

Fischer and Hornecker (2012) however, have conceived of a *Shared Encounters* framework that describes the different types of spaces that exist in an interactive display-based installation; each category has its own function in urban HCI (pp. 310-311). They induced these analytical categories by observing the urban spaces where they deployed their SMSlingshot over the years. Given that some of these categories are germane to this doctoral dissertation's discussion of the Mégaphone, these are described and applied in Figure 4.3 to provide a map of how types of content can map on or further define these categories. For instance, while the hearing range of the *sounds* emitted by the loudspeakers defined the activation spaces (AS); the *stage lighting* demarcated the interaction space (IS) and the social interaction spaces (SIS): the "Speakers' Corner" platform and the agora, respectively as shown in Figure 4.3.

Further, Lupien explained that because it was closer to human scale and more in proximity of the IS and SIS, the small media façade had been chosen to provide content that was more direct and delivered in real time, while the monumental media façade – towering high above the installation space further from the IS and SIS – was used to display asynchronous content that was meant to echo what had already been said. He compared the two façades to mountains to explain how content was tailored to scale:

> A little hill that is close by does not interfere with what we say when we speak. But a mountain that is far away produces an echo whose reverberation and persistence is determined by its proximity and scale. We conceived the role of each media façade according to this metaphor: the small media façade directly faced the audience sitting in the agora and it showed real time transcriptions, but you could only see these if you were within that restricted space. Moreover, those words disappeared

within a few seconds. This was not the case for the monumental façade. If you were sitting in the agora, you had to crane your neck and look high up to see it, but ideally, you saw it best when you would actually step out of the installation space. In this sense, its placement and scale gave it a far greater reach. Accordingly, the words that were displayed on it were not direct: transcriptions were not in real time. There was a delay, as there would be with an echo. Words took at least twenty seconds to appear and then lingered on the display for much longer. (A. Lupien, interview, 7 August 2014,~7min)

It was because of its scale and placement that the monumental media façade was chosen to make visible the underbelly of Mégaphone's system architecture. Before being transcribed for display, speech utterances were recorded and analyzed. All of the resulting transcriptions were then cumulatively stored in a database. This meant that the system could process data to accommodate two temporalities: a live mode *vs.* a sleep mode. And indeed, the designers decided to leverage the affordances of the computer database with the monumental media façade to display a visual index of what had been said at the "Speakers' Corner", either as it was happening live, or else well after the fact.

In *live mode*, the architectural-scale interface was responsive in several ways. First, drawing on a color palette ranging from yellow to indigo hues, its background color would vary in response to fine modulations in the pitch of the speaker's voice. For instance, while women speakers often produced a yellow or green background, men's voices typically cast a blue, indigo or red one, as seen in Figure 4.6, 4.7, 4.8, 4.9 and 4.10, respectively. Second, as seen along the horizontal axis in the center of Figures 4.6, 4.7 and 4.9, a white dynamic curlicue pattern of variable thickness would represent real time variations in amplitude and rhythm in the speaker's utterances over those words. Third, after a 20-second delay, some of the words captured by the microphone would start to appear in white font on the left-hand side of the building, gradually filling up the façade until it reached its right edge as Figure 4.11 and the triptych in Figure 4.12 illustrate; Words would appear individually and non-sequentially to visually echo parts of speech and punctuate what a speaker was saying. Once the monumental façade was filled with an all-over composition of words displayed in different font sizes, their display would persist for a few minutes before the whole façade was wiped clean. Less than a minute later, the next set of transcriptions would start to appear over the blank background, again from left to right. It is noteworthy that while the modulations of the

background color and the dynamic curlicue motif occurred in real time, words were always displayed with a delay; the monumental façade was indeed intended to provide an echo of the speech utterances.

But the designers did not leave it at that. They used the larger façade to explore interaction design scenarios that were structured around the passage of time: echoes of words from past speeches would also recur when the "Speakers' Corner" was not in use – that is, when the system was in *sleep mode*. After more than thirty seconds of silence at the microphone, the live mode would automatically deactivate and sleep mode would kick in as the default mode. The MySQL™ database – which kept a record of how frequently or recently a word had been uttered over the course of the deployment – would then be queried in order to select recurring theme words for display on the large media façade in a grid of red, white and black rectangular boxes as seen in Figure 4.13.

The first display to appear when sleep mode was triggered was a selection of the words that had been *most recently spoken during the interventions that had just taken place in live mode*. If sleep mode extended for more than five minutes, the system would switch to a display of the words that had been *most frequently spoken over the whole period of the deployment*. Then, a screen saver showing the Mégaphone logo would wipe out these words for a few minutes, until it too was wiped out to be replaced by a collage of several black and white photos of iconic public speakers that had made their mark in history. After a few minutes, the system would then cycle back to the tricolor grids displaying the words that were "most recently spoken" in alternance with the words that were "most frequently spoken" and followed by the screen savers, over and over again until live mode was triggered by new speech input and the database was updated.

In sleep mode, the graphic display was significantly different than in live mode. The designers created a data visualization technique that would encode a simple three-tier system to indicate how words were held in priority in relation to their recurrence. The size and color of each box was proportional to how often a word was used, with, for instance, bigger boxes – and thus larger font sizes – representing the words that had been uttered most often. Color reflected how often words had been uttered with red boxes containing the words most often pronounced; black for those at the second priority

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level and white for the third; Font color was simply chosen to harmonize with its box color, that is, to provide the best contrast possible for the words to be legible.

In sleep mode like in live mode, words were displayed all over the façade as units, regardless of their use within the context of a sentence or of their relationship to other words on the display. But it is noteworthy that in sleep mode, the grid provided a summary that quantitatively described *collections of information*; this data visualization offered a generic classification, a kind of statistical analysis or composite picture of past speeches made possible by the affordances of the database. Drawing on Manovich's oft-cited discussion of database as a symbolic form, Mégaphone's sleep mode was, in this sense, an interesting example of how new media design can reverse the relationship between syntagm as explicit and paradigm as implicit (Gordon, 2010, pp. 194-195).

According to Manovich (2001), syntactical forms constitute a useful analytical tool that can be used to understand new media designs in the context of human-computer interaction because a component such as a database can challenge traditional syntax. In language, as in analog media, syntagm presents a sequence of units in a sentence, image, montage, clothing outfit, etc. that one actually perceives, while paradigm is the larger set that these units exist within and have been selected from. This leads Manovich to argue that, in these contexts, syntagm is real and paradigm is imagined; syntagm is explicit and paradigm, implicit; syntagm is perceived *in praesentia* and paradigm, is conceived *in absentia*. But when an artifact makes the content of a database manifest, Manovich claims that this relationship is reversed: it is paradigm that becomes real and syntagm imagined; paradigm that becomes explicit and syntagm, implicit; paradigm that becomes perceived and syntagm that is inferred, because the "database (the paradigm) is given material existence, while narrative (the syntagm) is de-materialised [*sic*]" (pp. 230-231). As a result, databases allow designers to play around with the paradigmatic dimension in order to invent new ways of spatially ordering and presenting its elements, and even building on them, while the syntagmatic dimension drives temporal structures.

In the context of Mégaphone's dual modes, one could say that syntagm is the linear sequence of words spoken during an intervention, while paradigm is the broader lexicon that these sentences were made with: the collection and categories of words,

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themes and ideas that these evoke. In live mode, the structured sentences of the spoken word are broken up into word-units to be displayed on the monumental façade as a specific subset of what was said; As such, the graphic visualizations either represent a unique or a recurring utterance of a particular intervention. But in sleep mode, the words that have been used most often are displayed according to how recently and frequently they were used. This implies that, here, the word becomes a kind of index for a larger conversation that is going on between different people; it no longer refers to the specificity of a single speaker. It falls into the province of public interaction: what has been said by many and mediated by the system. To this effect, Lupien remarked that he would have preferred it if the Mégaphone sleep mode banner announced, "the most recently spoken ideas" or "the most frequently spoken ideas" instead of "the most recently spoken words" or "the most frequently spoken words". (A. Lupien, interview, August 7, 2014,~15min30sec). He felt that sleep mode displayed themes, not words:

> Our approach to the design of the sleep mode data visualizations was based on cognition and memory. I asked myself, 'how do we remember what people say to us in the everyday. Brain science tells us that what our mind tends to register, what we remember the most, is either what we have most recently heard, or else what we repeatedly hear over a long period of time. But with this repetition, comes a process of abstraction: a word becomes disembodied from its original contexts as its meanings are multiplied by more and more uses. This word is then the sum of the ideas it has expressed, and that sum is in itself an idea or a theme that has *shared meaning* [emphasis added]. While live mode allows individuals to enunciate their ideas, sleep mode articulates what these individuals have in common as a group. This is one way the design strove to reconcile the individual with the collective. (A. Lupien, interview, 7 August 2014,~11min)

While one could argue that the meaning(s) of any given word is the product of intersubjective agreement, cultural practices and linguistic norms – all phenomena that involve a large number of people – the design process that Lupien described was altogether different because the process of creating meaning was carried out, on the one hand by people and, and on the other hand, by the algorithms through which words were selected and ordered into the database. Hence, one could suggest that the Mégaphone system electronically mediated meanings produced in the context of public interaction.

To illustrate this better, it is useful to refer to tag clouds as a form of information visualization. The act of tagging may be performed by individuals or communities

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interacting on Web 2.0, but how words will come to be included, ordered and represented in a tag cloud visualization depends on data aggregators and algorithms. In this sense, tag clouds visualizations offer a good example of how human-computer interaction mediates a social, participatory process. More to the point, however, is that the relay between the activity of man and machine can expand, shift, exclude or highlight some words over others: the resulting word cloud reflects this process. As Smith (2009) argues, the designer as expert plays a key role in shaping possible outcomes (p. 906).

Here, the role of the designer is significantly different than when, for instance, one uses technology to create a *meme*, an image – often widely disseminated on the Internet – that has been tagged with a catchy word or phrase. The meme is produced by an individual and transmitted, sometimes even transformed, by a community. But tag clouds and Mégaphone's monumental display are an emergent phenomenon that result from the interaction between a user community and a system that invites them to tag or contribute words in an iterative process that computes meaning *according to a unique coding sequence programmed by the designer* [emphasis added]. With Mégaphone, the design intention was clear: in live mode, this code had to visualize the effect of an echo of the spoken word and in sleep mode, it had to transform the installation space into a palimpsest of concerns voiced by people that night (first display to cycle in sleep mode) or since the very first day of the deployment (second display to cycle in sleep mode).

Consequently, Mégaphone's two modes were integral to its design in that, on the one hand, they provided the switchboard that triggered the four sets of output interfaces and, on the other hand, they defined the dual baseline purpose of the installation: a "Speaker's Corner" running in real time/space supported by a giant public archive that could remember and publish the highlights of what had been said in *this* space. Without the database, Mégaphone's temporal structure would have been reduced to a succession of live interventions, each enacting a situated instantaneous and ephemeral "now". But its archival programme instantiated in sleep mode, altered and extended how human-computer interaction could construct temporality. Indeed, one could even argue that the system was *generating* its own way of experiencing memory by transforming words into ideas as a result of iterations in a conversation going on between people and computer code. While the ethical implications of this remain wide open to discussion, it is

noteworthy that here, we have an example of how new media design can bring to bear a media bias that highlights time over space, while typically, scholars emphasize the latter:

> In a fundamental way, use of electronic media transforms the spatial and temporal organization of social life, creating new forms of action and interaction, and new modes of exercising power, *which are no longer linked to the sharing of a common locale* [emphasis added]. (Thompson, 1995, p. 4)

Thompson's quote expounds an assumption that dominates a school of thought in social sciences, namely that the advent of wired networks has had the effect of expanding our access to space (technology allows us to perceive any place on the globe), but contracting our experience of time (interactions are experienced in the immediacy of the "now"). However, McQuire (2008) reminds us that this need not be so; Citing Virilio, he argues that the physical context in which interactive technology is designed and deployed can either dislodge or reinforce "the social primacy of embodied presence" (p. 10). For instance, if our experience of public interaction is online from our home or from a private station in the workplace, then technology primarily supports "various forms of action-at-a-distance". But designers can also choose to create systems, such as Mégaphone, that reverse this relationship by mediating the experience of time (the spoken word is a live performance *and* an archive that are mutually constitutive of one another), but is contained in the sharing of this space (in the embodied "here"). This poses the question, what are some of the processes that motivated technology design?

4.2.4.   Working through Design Trade-Offs: How the Limitations of Speech Recognition Technology Came to Shape Mégaphone

When asked what factor of the design process had most contributed in shaping the structure of Mégaphone, Lupien answered without hesitation that the design team's ball and chain had been the limitations and constraints posed by the development of the speech recognition software (A. Lupien, interview, 31 July 2014,~19min). Under the guidance of Gilles Boulianne, a small team of programmers at the Centre de Recherche Informatique de Montréal (CRIM) was asked to build a speech recognition system specifically for Mégaphone that could run either in French or in English. This provided

users with the option of seeing their words displayed in one of Canada's two official languages; two buttons near the microphone allowed the speaker to select a language.

Making the Most of a Limitation: Including Two Speech Recognition Applications

The last two subsections offered a detailed description of how Mégaphone's small and monumental media façades were designed to display different visualizations of the transcriptions of the same speech utterances, with the former emphasizing immediacy and proximity, while the latter afforded a delay and a remote vantage point. It should be noted that the Mégaphone system ran not one, but *two* distinct speech recognition applications each assigned to one of these two media façades. Appendix L provides a detailed technical description of how Mégaphone's digital components work and how they relate to one another within its system architecture, while Figure 4.14 schematically illustrates these components and the relationships between them.

Practically speaking, this meant that one speech recognition system processed voice data in French or in English for visualizations that would appear on the small media façade (modules labelled as "**SPEECH RECOGNITION – ENGLISH INTERMEDIATE**" and "**SPEECH RECOGNITION – FRENCH FINAL**" on Figure 4.14), while the other speech recognition system was used to display words in French or in English on the monumental media façade (module labelled as "**SPEECH RECOGNITION – FRENCH INTERMEDIATE**" and "**SPEECH RECOGNITION – ENGLISH FINAL**" on Figure 4.14). Once selected by the speaker, the one-language option automatically applied to both media façades at the same time, even though each façade would receive its transcriptions from its assigned French/English speech recognition software. Why did the designers choose to have the same voice input transcribed by two distinct speech recognition systems, each assigned to two façades? Frederic Osterrath, one of the CRIM researchers who implemented the speech recognition technology, explained how their trial and error approach led to this:

> Because this was an artistic project, the design process was very iterative. We took an existing speech recognition technology off our shelves and first adapted it as a dummy system that did not necessarily take into account what the use case would be. In other words, our first prototype did not include a language model. We wanted Moment Factory to become familiar with exactly what kinds of limitations designers face

when they are working with this type of software. Once they had tried it for a while, they came back to us and asked for a system with a higher efficiency rate and faster transcription time. In fact, accuracy and speed are currently two of the biggest challenges programmers face in the development of voice recognition software. Typically, the trade-off is that you must sacrifice one for the other. This brought us to develop two voice recognition systems. The one used for the small media façade was entirely different than for the large one.

This first system was designed to transcribe words "on the flag" in a continuous manner without taking into account how long the speech would be. It was built on the more traditional Gaussian mixture models (GMM) often used in the context of a live speech, such as for instance, in parliamentary speech transcriptions. Because it had to process data without delay to move on to the next utterances right away, this system could not take any time to include or statistically calculate a few hypotheses about precisely what was being said. For this reason, it yielded a single transcription result very quickly but generally not all that accurately.

However, the second voice recognition system was built on neural network technology, which is far more cutting-edge in the context of voice recognition. That one did not run in real time. It had a twenty second delay that was used to test out different hypotheses directly from batches of digital audio recordings, rather than from live streaming audio. These hypotheses were tested against the vernacular language models we custom-built by crawling on Québécois websites to collect as many colloquial expressions as we could. In the end, we iteratively evaluated system performance not only in relation to the type of speech that was uttered, but also to context. (F. Osterrath, interview, 9 December 2013, ~18min)

Osterrath later confirmed what Lupien had explained during his first interview: rather than sacrifice speed for accuracy, or accuracy for speed, the design team decided to keep both. Speech recognition technology presented a trade-off, but what if Mégaphone was designed with two media façades, rather than one, and each of these façades would run its own speech recognition system that favored either speed *or* accuracy? After all, the designers and the collaborative partnership had been discussing the idea of including a wall or a large panel behind the "Speakers' Corner" platform, which would show the audience the Mégaphone logo and credits. CRIM's first speech recognition system could make this display an interactive backdrop behind the speaker.

During his *post mortem* interviews, Lupien pointed out that this had presented many advantages in terms of designing to support public interaction. In his opinion, users would not have responded well to waiting twenty seconds for something to happen once they spoke into the microphone: some reward had to be offered immediately. This is what the real time voice recognition software on the small media façade provided. This coupling of the intermediate voice recognition software with the small media façade created an entry point that captured people's attention right away because together, their function was to show that the installation was responsive to the speaker's voice.

But Lupien added an important caveat: the designers had hypothesized that the fact that there was a twenty second delay for words to appear on the monumental façade would work in favor of *shifting people's attention* to a second interface which, by virtue of its slower reaction time, would draw people deeper into the installation space by maintaining their attention once the small media façade would become too familiar. The larger façade was thus a second entry point. Further, after testing the speech recognition system in the context of focus groups held at Moment Factory, Lupien and his team felt that the fact that transcriptions were either slow or not all that accurate actually helped create a third focal point: people's attention would inevitably keep coming back to the speaker or to people around them, thus dynamically shifting and distributing cognitive attention from the speaker to the small façade to the monumental façade to observers, back to the speaker, and so on (A. Lupien, interview, 31 July 2014,~24min).

Ten weeks of field observations and participant interviews support Lupien's comments. People tended to pay attention to the transcriptions on the small media façade for the first minute or two of an intervention, but their attention would eventually drift to the speaker until they discovered the monumental façade. Then, people's gaze typically tended to move back and forth between one and the other, and at times, of course to the people next to them, whether it was to watch how strangers in the agora experienced the space, or to talk with friends about what was going on, being said, etc.

Changing the Design Requirements to Optimize the System: Fortuitous Design

Lupien also talked about the fact that when CRIM first started developing the voice recognition software, the system's delay time for transcriptions appearing on the

the display was considerably longer than twenty seconds. Depending on the volume of speech, it could extend to several minutes. To give the programmers parameters that would help them speed up processing time, the designers changed their design requirements: rather than expect well-constructed sentences, they asked the CRIM team to develop a system that would break speech up into isolated words to be randomly displayed. The designers saw several benefits to this: first, it would allow the system to test transcription hypotheses more rapidly since analyzing a single word implies far less permutations than a sequence of words tied together.

Second, as a collateral outcome, breaking speech up into word-units would also facilitate the process of building a filter into the system to prevent inflammatory language from appearing; As Lupien explains, if the sentence, "Michel is a pig" is analyzed as a unit, the whole sentence might be rejected since the system will likely filter out any occurrence of the word "pig". However, if each word is analyzed as a discrete part, then the word "pig" might be excluded while "Michel" might be displayed. Third, in the event that a word like "pig" is not filtered out, displaying it as an isolated word, far away from the word "Michel" would lower the likelihood that they would be semantically associated. The result is that it is not "Michel" who is a "pig"; There is the concept of "Michel" and the concept of a "pig" as two discrete entities. Lupien believed that the effect of this was to open up the possibility of using language for playful free associations, rather than reducing it to furthering an ideological agenda in the forms of scripted phrases (A. Lupien, interview, 31 July 2014,~16min).

Here, we see how changing the design requirements to speed up processing time fortuitously provided the designers with a new toolbox to moderate content. Given that this project was produced by a major federal government agency (NFB) and deployed in public space (Quartier des Spectacles), content moderation was always a high priority; public institutions are held accountable on what is being published within their jurisdiction. Indeed, the jury members who selected Mégaphone expressed serious reservations about this aspect of the installation right from the start: what if people started swearing or using offensive language?

To assuage those concerns, on acceptance of their project, Moment Factory recommended that a list of proscribed words be established and used to filter out terms considered taboo. During the year that followed, there were countless discussions on this problem in production meetings and several moderation strategies were proposed. In fact, there was much disagreement amongst the expert stakeholders about how much content moderation there should be. Many on the design team thought that there should be no content moderation at all: people would deal with whatever was said and what would appear on the façades. Stakeholders from the collaborative partnership wanted a moderation protocol to meet their standards. But once it was agreed that words would be transcribed and displayed individually, the idea of applying a filter became intuitive to the design and much easier to apply (A. Lupien, interview, 31 July 2014,~6min30sec).

The CRIM interviewees confirmed that Moment Factory had added its own filter to their speech recognition applications. They described it as a proscribed set of "stop words" that would automatically be weeded out after transcriptions. This black list comprised some specific inflammatory words, as well as articles such as "a", "the", "I", etc. However, both computer scientists corroborated a peculiarity observed onsite during fieldwork: this filter was only applied in live mode, and therefore not applied to the words processed in the archival database and displayed in sleep mode. (G. Boulianne [and F. Osterrath], interview, 9 December 2013,~45min30sec). This is manifest in Figure 4.15, which shows the monumental façade on the evening of Wednesday, September 25, 2013, four weeks into the deployment. Here, we clearly see in big font the French personal pronoun "il" in a red box (indicating that it was most frequently used), and other French personal pronouns such as "ils", "tu", "lui" or the English contraction "it's", all words which never appeared on the façades in live mode.

Indeed, the sleep mode display shown in Figure 4.15 highlights another singularity of Mégaphone: in live mode, the monumental façade would either display words in French *or* in English, whereas in sleep mode, the system indiscriminately displayed French *and* English at the same time. For instance, we see the French words "merci", "pétrole", "gens", over the English words "look", "not" and "very" respectively. In a city like Montréal, where language politics exacerbates cultural differences and deep-seated cleavages between communities, such a giant bilingual public display – with its

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abstract quality of pinning single words from both languages in what seems like a random all-over composition – can constitute a powerful visual statement. Given that engaging in attempts to interpret the meaning of this artifact in downtown Montréal carries the risk of being too reductive, each can draw its own conclusions about what it evokes, but it is nonetheless a thought-provoking image suggesting, if not social cohesion, cohabitation.

According to Lupien, this kink in the system was another fortuitous design outcome. The reason for it was that once the language would be selected in live mode, the two speech recognition software for both media façades would run only in the language that had been selected. For this reason, live mode showed words in one language at a time. But in sleep mode, the words were extracted from the database, which would mix both languages by default and just store this data without classifying it by language. The result is that the archival collection of words was saved and displayed in two languages, while words in live mode were displayed one language at a time. This speaks to the idea that Mégaphone's two temporal modes – live mode and sleep mode – did not only serve to distinguish the dual skins of the monumental media façade, but also formed the nucleus of the system architecture. The next subsection further demonstrates how elements of Mégaphone's design – and by extension, of the Mégaphone experience – grew around this nucleus until the last day of the integration phase and onsite testing.

4.2.5. Designing Technology in Public Space: The Integration Phase as an Opportunity to Negotiate Design

It is noteworthy, that most of the lighting was designed onsite during the integration phase, mostly at the very last minute. In fact, Lupien explained that the aesthetics of the lighting was thought through only the night before the opening in the midst of the final field trials. In other words, the lighting was not part of the original design even though designers had been working on the project for over twelve months before field trials began. Lupien said that his team usually has a magic sheet or lighting toolbox, which they use to experiment with different lighting scenarios in the studio. This allows them to visualize different effects on a computer screen or on paper printouts.

When we started the technical trials in August 2013, all we knew about Mégaphone's lighting "toolbox" was that we had four moving lights that could be remotely controlled to project at a different intensity, color or directionality. But those stage lights were the initiative of Benoît Lemieux, one of the Quartier des Spectacles Partnership's senior technicians. We actually worked out the lighting in collaboration with him and other Partnership technicians. Because they were responsible for the management and maintenance of the lighting equipment, it made sense for us to work with them onsite; they would propose ways to light the space and we would try these out and make design choices accordingly.

For instance, it became obvious once we were onsite that we needed to use accent lighting to illuminate parts of the white industrial containers behind the "Speakers' Corner" platform so that the logo was visible, but also to define that section of the installation space. Similarly, we wanted to create the impression that the agora space was a warm and welcoming part of the installation so we used red lighting. Sticking to a palette of white, red and black (shadows) in the way we lit the space kept things simple and produced the atmosphere we were looking for. (A. Lupien, interview, 14 August 2014,~10min30sec)

In the end, it was agreed that the lighting would be responsive to Mégaphone's dual temporal modes. In this sense, it became a digital component that was fully integrated with the system architecture. In sleep mode, which is the default mode, the red ambient lighting floods the installation space evenly in warm mellow tones to divert people's attention towards the monumental façade, which shows the visual echo of topics from past speeches. Figure 4.16 schematizes the light beam of the four stage lights in sleep mode; the white beam diverted to the right is in fact a projection on the ground that invites people to visit the exhibition space behind Mégaphone. In live mode, the stage lighting is made up of one bright white spotlight aimed at the speaker and three red ambient lights flooding a warm glow on the agora: Figure 4.17 shows the color and directionality of each light beam. Figures 4.1, 4.2 and 4.5 show how the white spotlight isolates the "Speakers' Corner" platform in live mode.

In reference to Mégaphone, Lupien identifies three different types of lighting: *ambient* lighting, *dynamic* lighting and *environmental* lighting. The fixed accent lighting setup by Moment Factory in collaboration with the Partnership to define the industrial containers constitute a good example of what Lupien means by ambient lighting; it designates the continuous lighting of elements that create the scene. Conversely, the stage lights that changed depending on whether the system was in live mode or in sleep

mode was Mégaphone's dynamic lighting; It was responsive to input and expressive of the two modalities. Finally, environmental lighting refers to what is usually called ambient lighting in public space, namely, the already existing light infrastructure that illuminates the city streets at night. This lighting can be problematic because it cannot always be controlled but can create "light pollution" around media façades and large displays.

Indeed, one of the other technical challenges that designers faced during the integration phase was low contrast on the monumental façade. Among the factors that caused this problem was environmental light pollution and what Lupien called the "light pollution of the city at large" (A. Lupien, interview, 14 August 2014,~41min):

> The eight projectors were not intense enough to light the monumental media façade in the way we had planned it: we would have needed more lumens, which means either having more projectors or more powerful ones. Weak luminance translated into a narrow dynamic range. Practically speaking, this meant that we did not have enough contrast to make color gradients visible. As a result, the projections did not look sharp enough to allow us to include content with fine graphic details or subtle changes such as different tones of red, for instance. For this reason, we had to make a lot of last minute adjustments in how we developed graphic content. Originally, we had prepared a wide range of tones and colors and shapes that would appear on the big façade, but because the projections were too washed out, we had to reduce the data visualizations to hard-edged, contrasting colors. This is why the background only had saturated prismatic colors instead of tones. And even so, the projection was so washed out that colors seemed like tones. (A. Lupien, interview, August 14, 2014,~35min)

Figure 4.18 illustrates a gradient of orange to red on the monumental façade. This is what had been planned but was not possible to obtain *in situ*. Figure 4.10 is a field photo which shows that the red background came across as a monochromatic, solid color without much tonal differences. In fact, tonal differences were eliminated to maximize sharpness around the font. Figure 4.8 shows a moment when the background color was changing from green to blue in response to a decrease in the pitch of the speaker's voice; the lower part of the façade seems like it has different tones of blue but in fact, it is simply a blending of different colors.

In relation to this design challenge, Lupien's quote brings out two aspects of the design process that are noteworthy. First, the content – in this case, the way the data

visualizations were graphically treated – had to be modified at the last minute because of technical limitations that could only be identified onsite during the integration phase. In their case study, Halskov and Ebsen (2013) have also found that content designed in the studio or the lab often needs to be significantly adjusted onsite (pp. 675). Dalsgaard and Halskov's (2010) framework for designing façades also supports the idea that content must support the medium, with an understanding that the medium includes the spatial context (p. 2282). Second, being able to implement Mégaphone in public space required the help of expert stakeholders other than the design team itself. In a project of this scale, what is interesting is how these two design issues become intimately interrelated.

The making of Mégaphone provides an interesting example of how important it was for the designers to have established a good working relationship with those who managed the public space, in this case, the Quartier des Spectacles Partnership. This, in turn, underscores how, distinct stakeholder communities can each contribute to the design process at different stages and in the right context. A case in point is how Mégaphone's dynamic lighting was keyed. Lupien explained that much time and care had been taken to tweak the transition between sleep mode and live mode with the help of the Partnership's onsite technicians the day before the official launch:

> We worked on creating a fade-in effect that lasted between one or two seconds. It was a way to ease people into the idea that the system was now working and we were entering into a different kind of immersive moment. We saw it as a crucial visual cue to tell people that the system had been switched to "on" and something was about to happen. And for the speaker, it was like unrolling the red carpet for them: we blinded them with a spotlight to remind them that they were being transported onto a stage. (A. Lupien, interview, 14 August 2014,~22min)

> You know originally, we had programmed this lighting transition on the "Speakers' Corner" platform as an abrupt change from a red floodlight to a white spotlight as live mode was triggered by voice input into the microphone. It was just a basic sequence of one light switching off and the other switching on. The effect was much too jerky, like a jolt. We spent a lot of time with the Quartier des Spectacles' staff during the field trials in finding just the right timing for this cross-fade to create the illusion that the installation space was going from one state to another. (A. Lupien, interview, 14 August 2014,~27min)

During his interviews, Lupien remarked that, looking back, lighting was a very important dimension of the installation, and yet it was left to be designed onsite just before the launch. In retrospect, he believes that this was the right thing to do. His comment speaks volumes about the importance of addressing major design issues during the integration phase and thus allotting time for enough trial and error at this stage of making. This observation is also supported by Halskov and Ebsen's (2013) design research, which suggests that, when it comes to media façades, good design requires different design tools, strategies and phases to perform different task that properly address the complex nature of design challenges posed by this platform: many problems are resolved *in situ* or during the deployment (pp. 676-677). But Lupien's comments also highlight the fact that the Partnership technicians were actively involved in creating and refining the design of the installation space as it was integrated onsite.

The contrast problem on the monumental façade provides another example of how distinct stakeholders can come together to think through design challenges from multiple perspectives. During his interview, the Partnership's Chief Technology Officer explained that that he was well aware of the issue of luminance presenting a challenge on the monumental façade. Since the Promenade des artistes is located within the perimeter of the Quartier des Spectacles, the Partnership's onsite technicians control each "environmental" street light. As a result, they can be dimmed or turned off from the Partnership's technical headquarters on the design team's request. Indeed, eliminating light pollution around both façades was one of the first tasks undertaken during the integration phase. Because the small façade had a white background and its one Christie projector was in close range, most of this task consisted in making sure the stage lights did not spill on that façade (M. Charpin, interview, 9 January 2014,~4min15sec).

However, for the monumental façade, the projection distance was comparatively further and the surface exponentially larger. Although the Partnership was able to reduce light pollution to a minimum around its projection surface, a lot more beam power was needed. The problem was not due to an insufficient power supply, for the Quartier des Spectacles' digital infrastructure uses lighting systems and techniques that adhere to the

dark sky criteria in order to optimize light distribution and energy efficiency. The problem amounted to making decisions about how much should be spent on equipment:

> We had access to plenty of power but not enough video projectors. Our infrastructure is set up with eight Christie projectors for that media façade. We would have needed many, many more to achieve the graphic effects that Moment Factory had originally conceived. Having seen the technical setup for Robert Lepage's *The Image Mill* projection show, I can safely say that we could have used more video projectors and servers. For instance, *The Image Mill* had backup servers for every set of projectors so that when there was a failure, spectators would barely notice it since the backup would kick in almost immediately. But they did this with a budget twelve to fifteen times our own. We, on the other hand, had to make sure we would stay on budget, and of course, everything becomes a choice about what to prioritize. If you invest too much in equipment, you risk losing on the art. (M. Charpin, interview, 9 January 2014,~49min)

> We were able to produce Mégaphone on a relatively small budget because the Quartier des Spectacles permanent infrastructure made it possible for Moment Factory to design the installation with equipment and applications that were put at their disposal for free. Production costs were significantly cut down by virtue of the fact that equipment such as all the video projectors, the servers, the stage lights, the loudspeaker units, the electrical cables, and the general nuts and bolts neither had to be bought, nor rented. And of course, access to our fiber optics network and our software infrastructure was also free which is what makes the site exceptional for this kind of deployment. In fact, the big expenses were the onsite staff hired for three months specifically for this deployment, the purchase and rental of industrial containers, and custom-making the "Speakers' Corner" platform and agora space. (M. Charpin, interview, January 9, 2014,~11min30sec)

The Making of Mégaphone was therefore not just the making of an application, voice recognition softwares, a system architecture, and sets of interfaces or devices. Because it takes up a large area in public space, the installation was as much about the architectural design of a space as it was about the development of an interactive and immersive digital system. For this reason, such a technology cannot be designed only in a lab space or a studio. Dalsgaard and Halskov argue that "integration into physical structures and surroundings" constitutes one of the eight major challenges in media façade design (p. 2281), a claim also supported by Halskov and Ebsen's (2013) case study of the Danish Expo Pavilion (p. 675). With Mégaphone, the integration phase and field trials were instrumental in the design process. Indeed, is this not when the concerns of the experts stakeholders can be realistically negotiated? Dalsgaard and Halskov

(2010) argue that balancing stakeholder interests is critical to the success of a system (p. 2283). Even if their input was primarily intended to address issues related to administering economic resources, providing technical maintenance or managing the logistics of the deployment, the Partnership arguably contributed to the aesthetics of the design. For instance, the Partnership technicians participated in the design of the agora:

> It is the Partnership staff that suggested using the industrial white containers for the small media façade and the onsite master control room. Since we were providing a lot of the urban furniture like the benches, panels, lights and fixtures, we felt that those industrial containers would blend with their urban feel and with the plaza, the scale and what had been already planned for. In the end, I think that the fact that the design team accepted our suggestion largely contributed to how well the installation space as a whole harmonizes with the Quartier des Spectacles' aesthetic. (M. Charpin, interview, 9 January 2014,~1h00min)

The use of industrial containers as a design material was thus the resort of the Partnership. While the design team at Moment Factory designed the wooden "Speakers' Corner" platform as it was from their studio, Lupien confirmed that the Quartier des Spectacles technical support staff had made many contributions to the design of the actual agora space, especially with the stage lighting, as we saw. He further explained that the architect on the design team had worked out the exact placement of each of the industrial containers in the studio with 3D software (A. Lupien, interview, 4 September 2014,~8min). These containers became instrumental in spatially defining the installation space but they were the product of collaborative efforts between distinct stakeholders.

Figure 4.3 offers a view of the installation seen from above. It illustrates how Mégaphone was built on a small plaza surrounded by three sidewalks and a continuous, level open space that extends towards the East. Across the street on the North side is another sidewalk and some major bus stops positioned outside the entrance of a major subway station, the Métro Place-Des-Arts. Across the street on the South side is also a sidewalk that runs behind a wide cycling path, with the Place-des-Arts cultural venue behind. In the back of the small media façade, the West sidewalk leads southwise to another subway entrance which faces a large esplanade, a pedestrian-only promenade that opens up onto the city's main East-West artery. It may be difficult to imagine how the experience of Mégaphone could be contained within this vast, open, busy, traffic-

heavy setting. Yet, the participants described their experience of the installation space as "immersive", "tangible" and "intimate". I found this thought-provoking because, on the one hand, users don't generally refer to screen interfaces they cannot touch as "tangible", and on the other hand, if we take into account the scale of the monumental media façade, the installation was far from "intimate". Even though Mégaphone occupied a small plaza located on the North-East corner of this busy downtown intersection – covering an area of roughly 27 metre x 22 metre – *it seemed both modest and grandiose in scale*.

From a design perspective, this study purports that, in fact, this may have been a result of the interplay between all the input/output interfaces that were of different scale, orientation and placement. Together, they restructured the public space either by creating real physical boundaries or else conceptual boundaries constructed through content and interactions, as Lupien remarked. Further, this study hypothesizes that the life-size system components offered a dynamic contrast with the architectural-scale ones. This would have contributed in producing an immersive environment that, unlike virtual reality, called for physical interaction with interfaces, urban furniture and real people. But what part did the white industrial containers play in creating this impression?

Looking at Figure 4.3 we can see how the industrial containers were disposed on the plaza (all illustrated as long rectangular boxes). In center-left is the agora space which consists of benches placed in a semi-circle, closing in around the "Speaker's Corner" platform; the agora is flanked on the left by the two white planes that represent the small media façade and on the right by the grey box which is the onsite master control room (the diagonal rectangle behind the benches, in the center of the image). Figure 4.19 shows how the latter closed off the back of the agora, behind the last row of benches. Lupien believes that the placement of these industrial containers helped create the illusion of a dedicated "space of assembly", an intimate place that incited people to stay because it contained the action, and thus supported social interaction. (A. Lupien, interview, 4 September 2014,~5min45sec). One of the regular participants interviewed for this study corroborated this:

> The installation space is like a pretext to meet new people and chat with them because we are gathered in this place, which is like a campfire in

the middle of the city, a physical setting designed in such a way that we are around a point of action and that really makes you want to talk to people even if you don't know them. ([P7], interview, 14 November 2013,~19min)

Interviews with users, however, revealed a wide array of different perspectives, some in support of the designer's perception, and others whose personal experience was not aligned with it at all. For instance, many did not like the aesthetics of the industrial containers. Some even thought that they did not fit in a design concept that they thought was meant to reference agoras, public forums, political assemblies and a "Speakers' Corner", as evidenced by this exchange during the first focus group:

I could not understand what the containers were doing there [as support for the small media façade]. Why were they being used as a screen? [P3]

Yes! I was thinking, "Oh containers being used again! [P4]

Yes, it's becoming trendy to use them for everything… [P3]

Well, it's been going on for at least ten years in the field of architecture. [P4]

They use them as a cheap housing material in countries like Haiti. [P3]

Industrial containers have nothing to do with getting up and speaking. [P2]

Yes, that was the problem, there seemed to be no relationship between the container and what the space was being used for. [P4]

I would have preferred it if they had given the space the feel of a town square because that seems more in relation to the history of this kind of event. [P3]   (focus group #1, 6 November 2013,~20min)

About a third of the interviewees agreed with this critique, while the rest felt that the industrial containers were a good design choice. Most people expressed the idea that they were instrumental in defining the scale and the space of the agora, which people tended to measure in relation to elements closer to human scale, rather than the monumental façade. Some, however, did think that the latter delineated the space:

Because the façade is huge and impressive, it becomes a defining element of the installation. So instead of just listening to someone speak in a microphone – which is not something new – the big media façade

makes Mégaphone an artistic and architectural object, it makes the intangible aspect of the digital become palpable in public space and it gives people another reason to speak. ([P12], interview, 27 November 2013,~55min)

Further, like Lupien had noted, because it was monumental, impressive and intriguing, several interviewees told us that the large media façade was the element that had drawn them into the space, especially when they more than a block away:

You can't 'not notice it' even from afar and right away, you know what themes are being discussed. The projections on the big façade immediately informed us of what was going to be said that evening, and perhaps more importantly, what language this topic was being debated in. ([P10], focus group #3, 16 November 2013,~9min)

While it is noteworthy that the interviews with the users either corroborated or contrasted with the Moment Factory, the Partnership and the NFB's vision, intention and perception of their design, this is, of course to be expected; the reception of Mégaphone should provoke as many impressions as there are individuals who experience it. However, the fact that the study participants in the first focus group found the industrial containers to be misconceived, and several participants that we individually interviewed echoed this thought as well, is most interesting if we consider the process by which the industrials containers were made to be included in the final design: as was discussed, it was the Partnership's technical staff who proposed them as a design element, and the design team at Moment Factory who were left to decide how they should be stacked, where they should be placed, what their surface treatment would be, etc.

Upon reflecting on the data collected from all of the interviews that were conducted onsite and offsite with every stakeholder group, this study hypothesizes that, even though the industrial containers did not necessarily harmonize with any existing concept of what an agora or speakers' corner should look like based on historical sources, their improvised inclusion is actually somewhat aligned with the kind of design experimentation that Koolhaas (1995) suggests should be applied when urbanism meets architecture (p. 963). This is not to say that Koolhaas would have approved of this aesthetic; he likely would not have based on his tastes. But he would have approved of trying something new that did not typically reference what a classical agora or iconic

"Speakers' Corner" should look like and should be made of. Indeed, the architect would likely approve of the effrontery of reinventing the "Speakers' Corner" on its own terms:

> To survive, urbanism will have to imagine a new newness. Liberated from its atavistic duties, urbanism redefined as a way of operating on the inevitable will attack architecture, invade its trenches, drive it from its bastions, undermine its certainties, explode its limits, ridicule its preoccupations with matter and substance, destroy its traditions, smoke out its practitioners.

> The seeming failure of the urban offers an exceptional opportunity, a pretext for Nietzchean frivolity. We have to imagine 1,001 other concepts of city; we have to take insane risks; we have to dare to be utterly uncritical; we have to swallow deeply and bestow forgiveness left and right. (p. 971)

Of particular interest to this study is to highlight what made this design experimentation possible, namely *the process of negotiation between stakeholder groups that were defending different interests and agendas*. While Dalsgaard and Halskov (2010, p. 2283) describe this as a design challenge, this study argues that it is this dialectical moment that makes urban designs *possible* (Koolhaas, 1995, p. 971).

Experts such as designers, engineers, and artists may often cringe at the idea of having to negotiate the purity of their concepts with producers, technicians or users, and indeed, people typically reference what has been done in the past to imagine the future. For instance, although it was designed as a "Speakers' Corner" – essentially a digital soapbox which is typically a small pulpit in a park or on a street corner – most of this study's interviewees associated the Mégaphone installation with the idea of a Greek agora or a town square, and they accordingly made comments and suggestions on its design to make it look more like that environment, drawing on the history of what exists rather than trying to imagine what the future might look like, arguably the designer's task.

> It was a Greek agora, so I didn't think that all that technical apparatus was needed but we could feel that it was a space for citizens to gather as a community and we all had the right to express our ideas. ([P11], interview, 21 November 2013,~23min)

> It made me think of Ancient Greece…we gather in a public space and debate together…it is civic in its very essence…watching interventions on television or online would have taken away from this lived experience. ([P7], interview, 14 November 2013,~4min)

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What we are seeing with Mégaphone is a return to old forms of public space like the Greek public fora. ([P12], interview, 27 November 2013,~54min)

In terms of seating, I think it should have been steps that were disposed in a circular manner and the platform should have been lower into the ground since there is a long tradition of people sitting out in open spaces that way and the speaker being below them, like in a circular amphitheater. ([P1], focus group #1, 6 November 2013,~1h10min)

Our history of town squares and piazzas where people would come together would seem like a better format to be a reference of this kind of installation. ([P3], focus group #1, 6 November 2013,~21min)

This chapter attests to the fact that attending design production meetings and interviewing the different expert stakeholder groups had me becoming a participant observer within the context of the making of Mégaphone. But it was engaging with the end users onsite and interviewing them that really drew me into a deeper understanding of what were the real design challenges, opportunities and potential of this installation. The disjuncture between perspectives coming within and between different stakeholder groups allows the observer and knowledge translator to raise questions that go beyond design assumptions. I believe that it was because I was able to immerse myself in this "field of knowledge" that partial truths began to sketch a bigger picture *of what could be.*

The purpose of presenting all of the above perspectives is not to intimate that one design concept is better than another, but to demonstrate that each stakeholder group approaches a design problem with different concerns and references. More importantly, unless these groups communicate with one another, they are left with their own assumptions about the success or failure of a design. Whether Mégaphone should look more like an architectural element in a town square, a Colosseum or a shipyard rally is up for debate. But the question that is raised here is whether creating this kind of conversation across stakeholder groups can make for better design? And if so, what communication model or mechanisms could facilitate this conversation? The next chapters explore these questions through the lens of observations on design-in-use.

Chapter 5.

The Mégaphone as a Speakers' Corner: The User as Content Contributor and Observer

> *As media become increasingly mobile, scalable and interactive, the new mode of social experience in the media city is characterized by what I term relational space…by relational space I am referring to the contemporary condition in which the horizon of social relationships has become radically open.* (Scott McQuire, 2008, p. 240)

The last chapter outlined how the design of Mégaphone had taken two major orientations. Its design baseline had been, of necessity, that it would provide a digitally-augmented installation space that could concurrently function as a "Speakers' Corner" and agora to hold live public assemblies and fora. Above this baseline, Mégaphone should have the pliancy to become whatever end users wanted it to be. Lupien referred to this as playing with the system; HCI practitioners call it appropriation.

Field observations were made on how people used the digital installation for four hours during each of the thirty-seven evenings of the deployment. Of all the analyses that have been undertaken for this dissertation, at the time of writing, the field findings and analyses related to creative appropriation were arguably the most valuable contribution this present research can make to the HCI literature. In particular, four design scenarios for interactive public displays were observed in-the-wild. Each one provides high-level concepts that could inform the design of such public space interactive technological platforms. Given that this data emerged as a result of the inductive approach that was applied, the next two chapters will present field findings in order to demonstrate how a multi-sited design methodology might provide a powerful tool to bridge the gap between the expert approaches to new media technology design and the bottom-up community digital practices that shape *in situ* usages.

Most of the fieldwork was practiced with "theoretical agnosticism", that is, with minimal use of extant literature and theory, but an acknowledgment, nonetheless, that investigators come with prior knowledge that may bias or orient the work; concepts and theory can also later be used to illuminate findings (Pidgeon & Henwood, 2003, p. 138).[8] Given that data collection and analysis were performed from the ground up, no hypotheses were formulated for the purpose of this empirical study, but some questions were formulated before and during fieldwork to guide observations. These questions are:

- What happens when urban technologies enable an interactive two-way flow dialogical model of communication rather than a one-way flow of information?

- What forms of content are possible but currently under-represented or not represented at all?

- How does the material blend with the digital to enhance the users' interactive experience?

- How could such technologies be used to facilitate new forms of cultural, social and political interaction in real public space?

- What are the digital practices that such technologies afford or could afford?

- How can interactive technology be designed to support appropriation?

Fieldwork was consequently articulated on paying attention to these six research foci, with creative appropriation as the overall focus informing this ten-week qualitative field study of Mégaphone. Before field findings on creative appropriation are presented in chapter six, this chapter offers a detailed description of the baseline uses provided for comparison in qualitative terms, but also as a means to identify some social affordances.

5.1. Establishing a Baseline Use for Field Observations

To establish the baseline use, it is useful to refer to this study's *public interaction framework* derived and abstracted from Fischer's (2011) *ecologies of participation* framework, Preece and Shneiderman's (2009) *reader-to-leader* framework, and Purnelle's (2015) *design framework for participative art*. As shown in Figure 2.7, seven discrete categories outline different levels of participation, which each correspond to the role played by the end user during the deployment. In this study, levels 0 to 5 are considered *within the baseline* and levels 0 to 7 *above the baseline*:

(**level 0**)	uninvolved actor	*one inattentive or unaware of technological artifact*
(**level 1**)	unengaged observer	*one who observes from afar*
(**level 2**)	passive observer	*one who passively consumes content*
(**level 3**)	active observer	*one who actively engages in consuming content*
(**level 4**)	content contributor	*one who contributes content for observers*
(**level 5**)	collaborator	*one who communicates to enlarge the conversation*

| (**level 6**) | designer | *one who re-organizes, remixes or relays content* |
| (**level 7**) | meta-designer | *one who hacks or appropriates the system* |

Given its design affordances, Mégaphone provided an environment for people to come up to the "Speakers' Corner" and contribute content by simply speaking into the microphone (level 4), as well as the possibility of responding, adding or commenting on this content (level 5). Levels 0 to 3 describe audience reception on the part of those watching from the agora; this doctoral dissertation argues that passive observers should be considered as users or participants in the context of public interaction. Further, field observations in the context of baseline uses of Mégaphone provided data that suggests that certain interaction patterns emerged and recurred over the ten week deployment. Examples of these are presented in this section to lay the foundations of this study's *framework of social affordances*; these examples are organized as categories derived from an iterative analysis of field data using abductive reasoning (Douven, 2011).

5.1.1.   A Site for Public Debate, Public Assembly and Public Speaking

During scheduled interventions, levels 0 to 5 were instantiated as a matter of course. In particular, the digitally-augmented installation was used by people as a site for public speaking, public assembly and public debate. The most generic example of this occurred on the night of Friday, October 11, 2013 after 7 pm, when the ten mayoral candidates presented their political platform at the Mégaphone, a few weeks before municipal elections were held in Montréal. The intimate installation provided a rare opportunity for some citizens to compare the performance of contenders on a live platform in physical proximity. Just as the first televised debate – the famous Nixon *vs.*

Kennedy debate held on September 26, 1960 – has been said to have changed the course of political communication, watching the candidates practice oratory in person provided a new context for electoral debates. Based on onsite interviews, it was one of the least known independent candidates, Kofi Sonokpon, who came out the winner that evening: many thought he came across as "honest", "real", "untainted" and "caring". It is noteworthy that Sonokpon would likely have been excluded from a televised debate because he was not affiliated to a party and not among the five most popular candidates.

Hosted by Michel Désautels, a celebrated figure of Québec journalism, the mayoral debate was one of two evenings which saw a record number of people remaining in the agora for over an hour – between 180 and 200 people at any given time as shown in the diptych photograph in Figure 5.1. Unfortunately, once the television crews had captured their footage of the five major candidates, attendance went down to 60 people within half an hour. As a result, few people actually participated in the question period that followed the ten allocutions.

Interestingly, the only other evening that attracted a larger crowd was a rally spontaneously organized by the Canada Post union workers on Saturday, October 19, 2013. Figure 4.4 shows the scope of this event that saw the same 215 people stay in the agora for more than an hour. Contrary to the highly procedural and ritualized mayoral debate, this trade union initiative was modelled on the very tradition of Québec's politically agitated public assemblies that Paquette had imagined for Mégaphone; it was the sound of defiance that echoed throughout the Promenade des artistes that evening.

In addition, Québec's only independent daily newspaper, *Le Devoir*, also used the Mégaphone to reserve and organize a total of five one-hour interventions on Wednesdays evenings from week #5 to week #9, inclusively. Figure 4.5 shows two journalists at the "Speakers' Corner" hosting the first of these events. Four out of five of these evenings saw their journalists present editorial comments on a wide range of topics, including local arts and culture; economic and political paradigms of the 21st century; cycling and urban planning for human scale; and the historical roots of political corruption in the city. At other times, the Mégaphone would see local activists, intellectuals, students, artists and public figures self-programmed as guest speakers.

5.2. Mégaphone in Action: A Context to Observe Social Affordances in Public Space[9]

Such scheduled interventions were generally reserved several weeks in advance and publicized on the official Mégaphone website and paper-based displays strategically disposed around the installation space. They would typically begin with the Master of Ceremony (MC) briefly introducing the guest speaker(s), followed by the latter's intervention at the "Speakers' Corner" for a period of anywhere between fifteen minutes to an hour. In about one quarter of these sessions, the hour would end with people from the audience coming up to the microphone to share their views on what had been said.

Evenings that included scheduled interventions would typically proceed like the nights of Friday, October 4 and Saturday, October 5, 2013. On that Friday, the installation was switched on at 7 pm just after the sun had set; the first half hour was a quiet open mike session, where anyone could use the "Speakers' Corner". At 7:30 pm, Vigilance GMOs and Équiterre jointly held an hour-long intervention on genetically modified organisms and environmental issues hosted by Greenpeace activist, Rehn Thibault. On average thirty people were counted sitting in the agora at any given time; about six of them stepped up to the microphone to react to Thibault's presentation once it was finished. At 8:30 pm, about 28 people listened to another presentation, this time on community gardens, hosted by three women seen in Figure 4.1, representing the Groupe de travail en agriculture urbaine (GTAU), an umbrella group that includes several local grassroots organizations working in urban farming and social development. An hour later, this intervention segued into an "open mike session" during which three different people talked about the challenging experiences they faced when cycling in the city of Montréal, followed by the *Chorale du people* shown in Figure 5.2, a local choir made up of activists who write and perform their own lyrics to the tune of famous songs. That evening, the choir performed three songs: one that celebrated the salvaging of food wastes, one about the danger of GMOs and one denouncing the Enbridge pipeline project, a hot topic of the week among activists. Following this was open mike session with an attendance ranging from 5 to 55 people from 8:30 pm to 11 pm.

The next evening, on Saturday, October 5, 2013, in front of over 125 people, Greenpeace activists improvised an-hour long candlelight vigil in solidarity with Alexandre Paul and Paul Ruzycki, two Canadian members of Greenpeace who were detained at sea by Russian authorities on September 19, 2013, facing charges of piracy and possible imprisonment. This was followed at 8:00 pm by the Montréal chapter of the glocal grassroots initiative, "100 in 1 day", which saw several young people give a detailed and personalized account of the artistic interventions they had performed earlier that day in various neighborhoods to "improve our city and foster our communities" in this "festival of doing" intended to encourage civic action (Maurice, 2013, para. 2). Attendance during that hour varied between 65 and 100 people. It was during this group intervention that I first witnessed one of Mégaphone's social affordances.

5.2.1. Social Affordance: Inclusiveness vs. Exclusiveness

Most study participants remarked that what was special about Mégaphone's installation space was that it was indiscriminately open to everyone, including people who would generally be marginalized socially. Interviewees said that they felt that being able to hear first-hand testimonies by speakers who were generally stereotyped and excluded from the media and public space made their listening experience unique because they had access to the voices and perspectives of the disenfranchised in real time and real space rather than through the mediated and distorting lenses of mass media representation. But field observations further showed that this did not only apply to those who used the "Speakers' Corner". Mégaphone was also a welcoming space for those who just wanted to observe or else be part of the events on their own terms.

An instance of this occurred during the *100 in 1 day* intervention. It involved a young man who identified himself as Inuit during his onsite interview. This young man was not party to the *100 in 1 day* grass-roots community initiative, but when their intervention began, he was so moved by the sense of solidarity and warmth in the agora that he spontaneously went up to the "Speakers' Corner" and tried to stand as close as possible to the score of speakers. At times, he would also help to hold the *100 in 1 day* three meter-long decorative banner. This surprised the speakers who had not accounted for his presence, which could easily have been felt as intrusive. To complicate matters,

every time a member of the group spoke into the microphone, the young man made unexpected and expressive hand gestures while standing behind them. At first, this seemed to make many in the group uncomfortable. In the end, they chose to feign to ignore him. After a few minutes, the young man's presence seemed to just become part of the event. He would attentively listen to every speaker, nodding emphatically as they spoke while bobbing up and down behind them. At the end of their intervention, he took the microphone and exclaimed, "You are awesome people!".

Of particular interest in this incident is that in most public contexts, one would expect the young man to be ushered off and excluded. However, in this case, the civic action group came to accept his presence at the "Speakers' Corner". Even though he was somewhat disruptive, sometimes talking over the speakers or making large gestures around them, they chose to make him a part of the event by not excluding him. During a 10-minute onsite unstructured interview, the young man told us that this had been an extraordinary experience for him (young man, interview, 5 October 2013). When we interviewed the MC, he said that the way the civic action group had accepted the young man into the fold as he was remained his most memorable moment of the entire three-month deployment (L.-R. Beaudin, interview, 15 January 2014,~1h02min):

> His presence was one of the most spectacular events I saw… He could feel that it was a gathering…he was drawn to the space because he could see that people were assembling there. He had no idea what the Mégaphone was, and maybe he didn't even care…'you are beautiful people' is what he said. He was impressed by what people were saying, and this…this is what being together is all about. (L.-R. Beaudin, interview, 15 January 2014,~1h02min30sec)

The way in which the *100 in 1 day* community handled the young man's uninvited presence at the "Speakers' Corner" highlights the social porousness and informal character of interaction with grassroots movements who use ICTs such as Mégaphone, in comparison to more established and institutionalized sociotechnical structures. The activists had a well-defined tightly-knit group identity; a ceremonial sense of order was manifest in their interventions: each speaker was individually introduced and their intervention precisely timed. Their presentation format was fairly standardized. Had the young man stepped up this way on a stage that represented an established institution such as an academic environment, a press briefing, a book launch, a museum art-

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opening or a public inauguration, security guards would most likely have escorted him off the stage within minutes.

Because it was co-produced by the National Film Board of Canada and the Quartier des Spectacles Partnership, and because it was deployed inside the perimeter of the site of the Quartier des Spectacles, in theory, one could say that Mégaphone was deployed within an institutional setting. Yet, field observations suggest that the installation's ecosystem functioned much like the Internet in that it could accommodate networking and digital communication practices in institutional *and* non-institutional spheres alike – an affordance that has led Dutton (2009) to call the Internet a *Fifth Estate* (pp. 6-7).

This suggests that urban systems such as Mégaphone have the potential to be game-changers, since, like the Internet, they function as a digital environment for self-publication, self-representation and networking. Perhaps more importantly, such locative platforms cast a new light on the oft-debated norm of *net neutrality* by raising similar issues *in real public space.* The norm of net neutrality supports – for the public's interest – the idea that the Internet be construed as a common carrier by treating all content, sites and platforms equally (Wu, 2003, pp. 170-171). Practically speaking, net neutrality implies that access to internet service be regulated like a public good – a well awaited ruling passed in the U.S. on February 26, 2015, and several years beforehand in Canada (Kwong, 2015, para. 2). Field findings suggested that public space technology such as Mégaphone could be used as a public good, in the same way that people use the Internet, open access online computers in public libraries or urban furniture in parks. Such a status would determine whether it were to be an inclusive or exclusive platform.

Even in its baseline use, the three-month field study provided ample evidence that Mégaphone could afford social inclusiveness, or conversely be designed to exclude certain people. There are, of course, countless ways to modulate this affordance through design, but this can also be achieved in the logistics of the deployment. For instance, if end users had been submitted to a screening or vetting process to reserve their space in the programmed schedule, many may have been excluded, either because they would not have met certain criteria or they did not have access to a computer that met the

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technical requirements for the online registration process or the registration website was not well publicized and difficult to locate, or the place or time was inconvenient, etc. In this regard, it is easy to see how design extends to logistics. Nonetheless, the notions of inclusiveness/exclusiveness constituted an important social affordance of Mégaphone. The next example shows how developing a sense of inclusiveness can result in territorial behavior that encourages onomatopoeic forms of expression in public interaction.

5.2.2.   Social Affordance: Mimesis vs. Alterity

Mimesis, that is, imitating the gestures and actions of other users, has been identified as a common way to learn how to interact with a public system. Vom Lehn, Heath and Hindmarsh (2011) note that interactants often first learn by watching others at a distance before they take their turn (p. 202), while Sheridan and Bryan-Kinns' (2008) study explores how people engaging in public interaction often transition into various levels of activities such as spectating, participating and performing when they transition from the act of watching to imitating (pp. 305-306). And indeed, mimesis is not only a way of breaking social embarrassment, it is also in and of itself, a performative act. Conversely, *alterity* refers to an awareness of being other or different. It can also motivate people to perform or watch performances in public space, but for the opposite reason: alterity is a recognition that others are distinct from oneself, and by extension unique. In critical and cultural theory, it is often used to refer to the idea of what is other than selfhood, which makes "encounters with others" possible (McGowan, 2007, p. 79). While imitation is one way of expressing a desire to be with others, alterity is another. Both were motivating factors for people who participated in the Mégaphone experience.

On Saturday, September 28, 2013, the Mégaphone's microphone and stage lighting were turned on at 7:00 pm because, with the arrival of fall, night was beginning to settle in earlier. However, it was one of those nights when unusual things happened. First, a giant stage was temporarily set up that day for a free outdoor show on the street corner situated diagonally across the road from the Mégaphone; the looming presence of a much bigger and louder apparatus nearby made the Mégaphone seem tiny and insignificant. The onsite staff and the few regular participants who showed up looking for some Saturday night action at the digital "Speakers' Corner" all seemed worried that this

other, mysterious event might obscure what the online schedule had announced as an all-night open mike session, with no special programming whatsoever.

A second and more pressing matter of concern, however, was that the Master of Ceremony was nowhere to be found, nor was he responding to the messages that the online technician was leaving him. This had everyone onsite fretting over what to do because during open mike, he is like a ringmaster who manages the stage, introduces the speakers, instructs them on how the installation works and more importantly, harangues up passersby into trying out the "Speakers' Corner". And given his years of experience as a radio host, he was, to say the least, very effective at drawing in participants. His absence during open mike sessions always had a direct impact on the use of the Mégaphone; the key role he played became particularly obvious that evening.

Passersby looked upon the Mégaphone with curiosity, but just walked past without engaging with it. The regular participants, who, for the most part, had come to observe rather than speak, started to disperse or walk over toward the other stage to see what was going on there. Except for one woman – a regular attendee who had been showing up almost every one out of three evenings, and had stayed as an observer for a full hour and a half from 23:30 pm to 1:00 am on Friday, September 20th, as the onsite technician had noted (U. Dufour, onsite debriefing, 28 September 2013). As per my field observations and notes, I knew that on several occasions, this woman had watched how the Master of Ceremony used the microphone to call people off the street and invite them to use the Mégaphone. She had also seen people during open mike make big declarations about the importance of such and such an issue or very personal ideas.

Just around 7:30 pm, after almost half an hour of waiting for the Master of Ceremony to show up and seeing that the Mégaphone was being ignored, this woman suddenly did something quite remarkable. She walked up to the "Speakers' Corner", picked up the microphone and began to imitate what the Master of Ceremony usually said and did, almost word for word and with similar gestures. The sequence of four photographs shown in Figure 5.3 show her calling out to people, inviting them to use the installation, showing them how it works and holding the microphone for them while she incites them to recite poetry, sing or voice out their opinion, and – not visible from the

photographs – explaining to passersby how unique and important such an instrument of free speech is in today's civic life. This went on until the Master of Ceremony finally arrived around 8:00 pm. During that half hour, she addressed several dozen people in the street, some of which would approach, but timidly express their reserve at taking the spotlight to use the installation. She would patiently take the time to draw them in by showing them how the system displayed transcriptions of the spoken word. As a result of her efforts, at least eleven people took turns at the "Speakers' Corner" and twice as many people came to listen to them within the agora space. In fact, she facilitated peaks of interactions that briefly attracted small but noticeable audiences, who would, in keeping with the *honey-pot effect*, gather and disperse with the flow of speakers.

The honey-pot effect is a well-known social affordance around interactive display-based systems. Over ten years ago, Brignull and Rogers (2003) defined it as "the progressive increase in the number of people in the immediate vicinity of the interface or interaction zone" (p. 20). It is not a category in this section because it is already well established and often discussed in many studies on displays. It was indeed, an important social affordance at the Mégaphone. Field notes showed that the open mike session of the evening of Thursday, September 26, 2013 had several good examples of the honey-pot effect. The installation space that night was often empty for fifteen minutes at a time. When a person alone or a couple would come to try out the microphone, it was rare to see crowds form around them. But if a small group of two to four friends came and made some buzz because they were interacting with each other playfully at the "Speakers' Corner", we would see single people, couples and small groups come off the street with or without their bicycles and sit or stand in the agora space. In turn, this seemed to attract more people off the street, and in a matter of minutes, the space had gone from being empty to accommodating a few dozen people. What's more, it seemed like people would be attracted into the space while they were watching others move into it. In other words, when people were standing or sitting still, people were less likely to come off the street. It was seeing people walk into the space that made others walk into it. For this reason, one could surmise that the honey-pot effect is yet another form of mimesis: if people see others come, they imitate them.

Ouspensky (1971) argues that mimicry and mimesis in nature are ways for living beings to express "theatricalness", a way by which organisms communicate with one another by mirroring each other to relate to one another (p. 44). Benjamin (1986) also makes a similar argument by postulating that "from time immemorial the mimetic faculty has been conceded some influence on language" and especially, with regards to the more primitive forms of communication, "imitative behavior in language formation was acknowledged under the name of onomatopoeia" (p. 334). Reeves, Benford, O'Malley and Fraser (2005) remark that in public settings, the interactant as performer and the observer(s) as audience can be understood as mutually engaged in a performative cycle of interactions (p. 742). Mimesis, then, may well be the very staple of public interaction.

In their observational study of how people used a series of chained displays deployed in a semi-public space, Ten Koppel, Bailly, Müller and Walter (2012) found that the social learning of a system is optimized for spatial configurations in which people can, at once, watch the interactant in action *and* the effect it has on others actors within the space because it allows people to imitate one another (p. 323-324). And so it is that the woman who acted out the Master of Ceremony's routine in his absence was by no means the only case of mimesis at Mégaphone.

In fact, it was not uncommon to see threads of interactions where people would imitate those they were succeeding, one after another. For instance, that same evening, a dad and his two children tried out the system by repeating "this Mégaphone works well: I love this system" to see if words would appear on the display. A young couple walking by watched them and when the family left, they took their turn at the Mégaphone and said and did *exactly the same thing*. More broadly, people would often successively perform interventions on the same theme during open mike sessions. For example, if one interactant began to read poetry from reading a text on their smart phones, others would follow doing the same thing. More frequently, people would come to perform at the Mégaphone during open mike: music performances were followed by other music performances; singing was followed by singing; and people using the "Speakers' Corner" as a juke-box to play a tune from their smart phone was followed by others doing the same. Further, once one person would start to sing karaoke over their smart phone, others would do so too, as it happened on the evening Saturday, September 14, 2013.

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According to Goleman (2006), the neural dynamics of human relationships have always heavily relied on "mirror neurons" which allow us to "sense both the move another person is about to make and their feelings, and instantly prepare us to imitate that movement and feel with them" (p. 9); they are activated "during our emotional reactions to others — particularly instant empathy" (p. 66). Indeed, early research on mirror neurons – discovered in the 1990s by a group of researchers led by Dr. Giacomo Rizzolatti – reveal that they are complex systems of neural cells located in areas of the brain such as the premotor cortex, the posterior parietal lobe, the superior temporal sulcus and the insula. Triggered by the awareness of another's action, they are responsible for simulation and imitation and are said to have the capacity "to analyze scenes and to read minds" (Blakeslee, 2006, para. 21). By extension, some neuroscientists have attributed the experience of empathy to mirror neurons, but they are also said to play a major role in culture in that imitation has been an effective means of social sharing and social learning (para. 23). The caveat, however, is that mirror neurons work best in person when people are face-to-face; studies have found that virtual interactions do not measure as effectively (para. 28). This further supports the idea that mimesis and alterity are important social affordances of public interaction; it also speaks to what seems to be another linchpin of public interaction: co-locatedness.

5.2.3. Social Affordance: Co-Locatedness vs. Virtual Representation

Co-locatedness is arguably one of the first social affordance to be associated with the study of digital public display systems. It simply signifies being physically present as an interactant or observer in a shared space. It is abundantly mentioned in early HCI user studies on interactive displays, especially in the field of CSCW, where interactive display prototypes were being developed to support collaboration in work environments and research labs as far back as the late 1980s. However, co-locatedness is not usually referred to as an affordance. Instead, researchers tend to call it a physical ergonomic factor relevant to the design of large digital display systems (O'Hara, Perry, Churchill, and Russell, 2003, p. xxii). Yet the empirical case studies of Social NUIs in chapter two suggest that, at times, physical ergonomic factors can be affordances.

The use of these terms in HCI actually reveals a contentious issue, namely the problem of having practitioners agree on exactly what constitutes an affordance (Kaptelinin & Nardi, 2012, p. 967; Rogers, 2004, pp. 99-100). While affordances are mainly concerned with features that call the user to *action* (e.g. a button that performs a function) and that offer *constraints* (e.g. the possibilities of a small vs. a large screen size), Kaptelinin & Nardi (2012) argue that the HCI interpretation of the concept of affordances is divorced from its Gibsonian root meaning (p. 968). They suggest that this is an opportunity for designers to re-ground the concept of technological affordances in a new definition that would better capture the social and cultural context of action, rather than focus only perception and action as cognitive phenomena (p. 973). Interestingly, their critique no longer has traction when researchers develop the concept of "social affordances" based on the original Gibsonian meaning, a task that would be difficult to do with the HCI notion of affordances theorized by Gaver (1991) or Norman (1999).

As Rogers (2004) remarks, the main distinction between the HCI interpretation of affordances and Gibson's original meaning is that "the common HCI understanding refers only to the properties of an object, whereas Gibson used it to account for *the relationship* between the properties of a person and the perceptual properties of an object in the environment [emphasis added]" (p. 100). Gibson's ecological approach implied that affordances *existed by virtue of an observer's perception of the properties of an object*, and thus was concerned with the relationship between one and the other:

> …the affordance of anything is a specific combination of the properties of its substance and its surfaces taken with reference to an animal…an affordance is not bestowed upon an object by a need of an observer and by his act of perceiving it. The object offers what it does because it is what it is. (Gibson, 1977, p. 67, 78)

This implies that an ergonomic factor (or another physical property) *is* an affordance, with the caveat that the notion of affordance more broadly includes how an ergonomic factor is perceived and used. With this in mind, in this doctoral dissertation, co-locatedness is a social affordance defined as the state of being together and interacting with people and content in the physical space around a display. Conversely virtual representation designates connecting and interacting remotely with people and content that are not in one's physical location. Here, the difference is simply ergonomic

as it is solely related to actual physical location. However, it is a useful social affordance in that it can deeply affect the perception and interpretation of one's experience of people and content. The following case study at the Mégaphone illustrates this.

Founded by ten students from Université du Québec à Montréal (UQAM), *l'École Urbania* is the young academic branch of Urbania, an urban media group that produces multi-platform content, which includes a website with news, interviews, games, photo galleries, an online urban museum, a weblog, several web series, as well as off-line content, such as a paper-based version of their quarterly magazine. Most of this content is produced for members of their online community, young urbanites craving for culture. Urbania's mission is to "render the ordinary extraordinary" (Urbania, 2010, para. 2).

Throughout the summer, the undergraduate members of *l'École Urbania* put together a manifesto of "100 creative and pragmatic ideas for the city", which ideated programs with a wide range of objectives such as improving community services like *Meals on Wheels* or proposing innovative urban planning interventions to elected officials. Although their content is typically disseminated via online platforms, a printed publication was also issued to publicize this manifesto. When they found out about the Mégaphone deployment, however, *l'École Urbania* decided to lend itself to the game, and seize this opportunity to reach out to a wider public of urbanites off-line.

They were the only non-institutionalized organization to use the Mégaphone on a regular basis to harness the power of digitally-augmented public space. During nine consecutive weeks, every Thursday evening around 9 pm, *l'École Urbania* programmed a one-hour presentation at the Mégaphone as part of their series: "Imaginer Montréal" (loosely translated into English as "Imagining Montreal"). Figure 5.4 shows the details of all nine scheduled intervention. Each of these nights saw eight to ten UQAM students address audiences that included anywhere between 5 and 125 people. The interventions were always conducted in the French language, with each speaker taking their turn at the microphone for about five minutes.

As autumn progressed, the weather became colder with occasional rainfalls. The evening of Thursday, October 24, 2013 was particularly cold; few people showed up for *l'École Urbania's* intervention that evening. A head count performed every fifteen

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minutes established that the intervention started with 3 people in the agora. The group increased to 7 people, then to a maximum of 18 people, with 2 people left at the end of the session when the rain began. The previous week had also been fairly cool, but there had remained a steady audience of about twenty people. As a result of this change in the weather conditions, *l'École Urbania* cancelled their last programmed intervention on the topic of recreation and leisure, scheduled on Thursday, October 31, 2013. In effect, they conducted a total of eight interventions, including a special evening dedicated to the official launch of their manifesto publication on Thursday, October 3, 2013.

By using Mégaphone on a regular basis, *l'École Urbania* leveraged the co-locatedness of this type of platform. According to De Souza e Silva (2006), human-computer interaction that takes place within a situated physical setting is ontologically distinct from forms of extended presence or virtual presence that users experience in virtual reality, mixed reality, augmented reality, hybrid space and cybrid space (p. 262).[10] Specifically, co-locatedness supports types of social interaction that would either be impossible or less likely in these spatial interaction paradigms. For instance, as discussed in the last subsection on mimesis, there is actually hard scientific evidence that supports the idea that co-locatedness favors a better neuronal response toward empathy. Further, as we saw with the mayoral debate at Mégaphone described in the beginning of this chapter, people tend to interpret their impressions of a speaker differently when they see them live rather than through a digital screen: a candidate comes across as more or less sincere, assertive and arrogant depending on how their speech is mediated. Onsite co-located experiences and remote online virtual representations can complement one another by exposing different dimensions of content whether it is live, virtual or archived.

In particular, interactive large displays typically accommodate multiple users that can either use the display simultaneously or else engage in different levels of participation while sharing the same space, to interact *through* or *around* the display. In this sense, Mégaphone offered *l'École Urbania* an unprecedented opportunity to broadcast their content that had, until then, primarily be confined to the online realm. One of the other key implications of co-located social interaction around Mégaphone was that people in the audience might turn to friends or strangers who shared the space

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to discuss this content during or after the intervention. This, in turn, highlights the public character that "co-located content" can take onsite and offline, and its social potential.

5.2.4. Social Affordance: Publicness vs. Privacy

More than a decade ago, the extant literature identified some of the principal social factors involved in interaction with displays; these included ergonomic factors as well as awareness, control, identity, coordination, information persistence, information relevance and publicity vs. privacy (O'Hara et al., 2003, p. xviii-xxv). A key work mentions, in particular, the management of publicity vs. privacy as a design dimension (p. xxiii). Proposed in the context of public displays, it is noteworthy that the issue of publicity places the emphasis on content, rather than on behavior: "*Publicity* is 'information that concerns a person, group, event, or product that is disseminated through various media to *attract public notice* [*sic*]" (p. xix-xx). Indeed, for an engineer or designer, the issue of "management of publicity vs. privacy" would likely be operationalized as a feature, or affordance, of information management. Field observations, however, suggested that focusing on *publicness* as a human factor might provide a more holistic understanding of the interactional potential of displays. In social theory, there is a corpus that frames publicity and publicness as a socio-political action.

Drawing on rich theoretical sources, McQuire (2008) argues that in Western culture, public behavior has found significantly different expressions over the past three hundred years. This is ostensibly a result of the major structural and architectural changes that reconfigured city life on the heels of industrialization (p. 134). Tracing the history of the reorganization of society and its public spaces since the eighteenth century, his analysis describes how the distance that once separated one's public persona from one's private self was slowly obliterated over the course of the nineteenth century as cities were modernized. According to McQuire, in the eighteenth century, publicness was a condition that was performed by "play-acting" in public; one's public self was not to be confused, or associated, with one's private self. However, he claims, in the nineteenth century, this performative form of public expression gave way to "a heightened demand for 'authentic' personal interaction", thereby creating "the modern conditions in which people came to believe that 'community is a mutual act of self-

disclosure'". Drawing on Sennett's writing, he concludes that this shift may have limited people's capacity and desire for public expression. As a result, certain public figures such as actors, politicians and orators, were invested with the responsibility of public speaking on the behalf of the majority of the people (p. 135).

McQuire (2008) mainly attributes this phenomenon to two factors: the remodeling of social *and* spatial structures, which had the effect of encouraging passive observation over active participation: "The result was a public culture privileging looking over talking, detachment over engagement" (p. 135). The Haussmannization of Paris, like the New Architecture of Le Corbusier, transformed public space into a spectacle where people watched over each other silently. This, argues McQuire, is the historical moment that paved the way for mass media to become the preferred mode of public expression, especially in the realm of politics. Once urban spaces were opened up by wide boulevards, glass and high-rises, people of different classes and ethnic backgrounds became fully exposed to one another's gaze. New technologies were needed to mediate communication and thus compensate for rapport that would otherwise be too direct.

McQuire's writings on public space and the media city help illuminate this study. While O'Hara et al. (2003) focus on the public character of content in display systems, field observations suggested that Mégaphone's "Speakers' Corner" and monumental media façade afforded new forms of digitally-augmented publicness and visibility that highlight people, interactions and communication processes instead of data. If the nineteenth century displaced social intercourse from real public space to media space, and reified information as the locus of knowledge and communication, the way Mégaphone was used suggests that it could be serve as a tool to reverse this process by simultaneously bringing them together.

There were as many examples of this as there were interventions, whether they were programmed in advance or not. Over the course of the deployment, several young activists, students and university professors came to publicly speak on specific topics while making commentaries and answering questions on related issues that were newsworthy current events. Such public interventions included political participation in the upcoming municipal elections: Michel Venne from the Institut du Nouveau Monde

(INM) on September 5, 2013; the relationship between economy and democracy: Ianik Marcil, UQAM professor on September 12, 2013; the scarcity of student housing: students from UTILE on September 13, 2013; the Charter of Québec Values: Gabriel Nadeau-Dubois, student activist on September 18, 2013; the *Idle No More* Québec movement: Melissa Mollen Dupuis, Native activist on September 25, 2013; the widening socio-economic gap between Montrealers: the INM on October 3, 2013; Feminism in contemporary Québec society: Léa Clermont-Dion, feminist on October 9, 2013; social integration of youth and women: Cathy Wong, activist on October 17, 2013; alternative resources for mental health patients: Céline Cyr, researcher on October 23, 2013.

All of these instances saw end users use the installation space as a digitally-augmented stage to express their perspective on subjects of public interest. But the designed affordances of Mégaphone allowed them to do this in ways that go far beyond the mere act of public speaking. While the loudspeaker units amplified the speakers' voice, the installation also augmented their visual presence. On the one hand, the monumental media façade gave people access to a visual representation of the speakers' ideas, and on the other hand, the stage lighting provided the speakers with a platform to physically perform publicness in urban space. This highlights the three main sensory channels that Mégaphone appealed to: audition, vision and haptics.

Here, it was not only public space that was reclaimed but also the practice of publicness itself that had, as McQuire has remarked, increasingly become the exclusive privilege of a small elite of celebrity figures since the nineteenth century. This analysis also maps onto Habermas' (1989) work on the rise and decline of the public sphere in bourgeois society. By providing a grounded basis for the socio-cultural origin of a discursive public arena in the nineteenth century era of market capitalism and liberal democracy, and then by following its historical mutation into 20th century monopoly capitalism and imperialism, Habermas' Bourgeois Public Sphere model has led to a fertile renewal of critical theory in relation to issues of democratic participation. Contrary to how it is often applied in the literature, one must not forget that Habermas did not reduce the public sphere to a media text or content. The Bourgeois Public Sphere did not consist of newspapers and books. It was made up of people interacting in places *around media texts*. As Gellner (2000) writes, "The public sphere consisted of organs of

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information and political debate such as newspapers and journals, as well as institutions of political discussion such as parliaments, political clubs, literary salons, public assemblies, pubs and coffee houses, meeting halls, and other public spaces where socio-political discussion took place" (p. 263). Habermas construed the public sphere as a discursive space situated in the lifeworld, a social space that emerges from the interplay of the physical and the discursive, and from the material and the conceptual.

Contrary to most digital information and communication technologies being designed today, Mégaphone allowed end users to engage in playful self-representation that supported *embodied* publicness, ostensibly helping to bring back the lost art of public speaking for everyone, precisely as the designers had intended. But this installation added a new dimension to oratory: its monumental display supported simultaneous and archival self-publication of graphic text in public space, which has long been the prerogative of advertisers, corporations and institutions. In this sense, this interactive digital technology was used both for public self-representation and mediated self-publication. If, as this study argues, a technology like Mégaphone affords publicness, then how does it relate to privacy and private space?

In his canonical presentation on the use of YouTube™, Wesch (2008) argues that Web 2.0 links people through the sharing of user-generated content on platforms that enable anonymity, a sense of physical distance and ephemeral dialogue, which ostensibly give people the "freedom to experience humanity without fear or anxiety" (~29min09sec). During the deployment of Mégaphone, similar forms of participation were observed except for the fact that they were happening live, without the anonymity, the sense of physical distance or the ephemeral dialogue – since the speakers' words were published on the large media façade. This social affordance is what differentiates the forms of offline interaction made possible by technologies such as Mégaphone from online interaction: Mégaphone's design places more emphasis on publicness than on privacy. Whether or not this may be relevant to interactive display-based system deployed in public spaces presents an important question for future research.

5.2.5. Social Affordance: Embodied Interaction vs. Extended Presence

For the purpose of design research, this study draws a distinction between the social affordances of co-locatedness and embodied interaction. Although they may appear quite similar, the former hinges on being together, while the latter is contingent on sensory perception and is underpinned by a phenomenological theoretical perspective (Dourish, 2001, p. 100). Dourish does purport that one of the objectives of his embodied interaction paradigm is to bridge two long-standing HCI research traditions — tangible computing and social computing — by establishing the common ground they share and demonstrating that both these research traditions are related to embodiment (pp. 191-192). This suggests some overlap between co-locatedness and embodied interaction. For instance, embodied interaction can make our behavior visible to others "co-located" around us (O'Hara, 2014, notes). In this sense, it does have social reach.

Construed as a social affordance, embodied interaction is also not to be confused with publicness. As noted in the previous subsection, embodiment underlies the condition of publicness involved in interacting with a monumental digital display, but embodied interaction emphasizes physicality, or as Dourish (2001) points out, the relationship between the user, the technological objects and the physical setting (p. 189-190). Conversely, publicness expresses a state produced by a socio-historical context in which people use space or technology to make meaning. Drawing on Heidegger, Dourish (2001) would argue that embodied interaction may also be a way of making meaning, but instead of being rooted in the socio-historical, this meaning emerges from one's unique and authentic way of encountering the world physically (p. 108). Further, although the notion of space is central to embodied interaction and publicness, one could say that the former stresses physical space and the latter, discursive space. And lastly, embodied interaction is distinct from publicness in that it could be a private act.

While Dourish (2001) theorizes embodied interaction as a methodological approach, this study proposes that it can also be understood as a social affordance. The two main assumptions that underlie embodied interaction make it possible to operationalize it more practically for design research. First, "embodiment means possessing and acting through a physical manifestation in the world" (p. 100), and

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second, "embodied phenomena are those that by their very nature occur in real time and real space" (p. 101). These assumptions imply that embodied interaction goes beyond computational media as merely representational, and situates it in action and experience (p. 208). Field observations of Mégaphone provide several examples of this. In real time and real space, people would express themselves non-verbally through body posture or their position within the installation space.

For instance, on the evening of Wednesday, October 9, 2013, a young feminist activist, Léa Clermont-Dion, eloquently spoke during almost an hour in French on the subject of gender discrimination in Québec. Her allocution was both convincing and provocative as she cited statistics and many case samples drawn from empirical studies. During her intervention, a middle-aged man waiting for public transportation walked into the agora to listen. His bus stop happened to be at the periphery of the agora, very near the last bench towards the corner of Jeanne-Mance and de Maisonneuve. He sat on this bench and listened to Clermont-Dion's intervention for a few minutes and then stood up and turned around to sit on the same bench, but in the opposite direction. This had him facing towards the street, opposite the "Speakers' Corner" and thus Clermont-Dion and audience members, as seen in Figure 5.5. The way the man turned his back to the young feminist who was denouncing sexism can be interpreted as a form of individual embodied expression that sends a visual message to others in the installation space. In a sense, it is a display of alterity – of a sense of being different – the opposite of mimesis. But embodied interaction is quite distinct from the social affordance of mimesis/alterity because the former is a communicative action that can be expressed as a thought, a verbal expression or a physical gesture, the latter presupposes a sense of awareness in space. Further, the fact that it could produce meaning in relation to other people's presence suggests that it is a social affordance related to the space as a whole.

For instance, sometimes, the speaker would turn their back to the audience. This happened a few times during the deployment. In particular, it was observed on the evening of Thursday, October 10, 2013 when two young girls who identified themselves as queer took turns reading the erotic poetry they had written. Although there were less than 4 people in the agora, there were nevertheless passersby who walked past on a regular basis. Figure 5.6 shows one of the girls in action. By turning their back to the

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agora in this way, one could surmise that the girls may have wanted to keep part of their identity anonymous during their readings. But in fact, when they were interviewed onsite, they said that their gesture was not meant to hide their face, but to adopt a physical posture that expressed their opposition to mainstream norms during their performance.

Again, this highlights the idea of embodiment as a social affordance. Van Loon (2008) describes the concept of "extended presence" or "partial disembodiment" as the state of being immersed in a 3D space that has nothing to do with our immediate physical space (p. 107). This is experienced, for instance, in virtual reality, wherein our visual attention is displaced from our actual physical setting. It also seems more fitting to use the concept of extended presence to describe online interaction in social media environments. Observations made in this study suggest that extended presence can thus be seen as the counterpart of embodied interaction. This, in turn, is a reminder that embodied interaction may be an affordance that is specific to public space technology. There is no equivalent form of physical expression online for the two examples cited above, except perhaps how people might use emoticons as their symbolic expression. This points to another social affordance that is distinct from co-locatedness, publicness and embodied interaction, namely the situated character of Mégaphone.

5.2.6.   Social Affordance: Situatedness vs. Mobility

Recent scholarship has remarked that mobile HCI is currently the fastest growing research field in the HCI community (De Sá & Churchill, 2013, p. 76). Technological advances such as the development of smaller and more accurate sensors have made possible a wide array of new applications for smart phones, including Mobile Augmented Reality (MAR) features. And indeed, influential theories on interaction typically tend to assume that it is mobile technologies that bring culture into public spaces (De Souza e Silva, 2006, p. 270). But with its immobile interfaces, Mégaphone provided an entirely different model to study interaction. Contrary to mobile interfaces such as smart phones, tablets and wearables, its two digital displays and "Speakers' Corner" had the particularity of being *situated* in the sense that it was permanently fixed in a given location. Further, it did not support a permanent connection to the Internet which meant interactions were digitally-augmented onsite. Could this constitute a social affordance?

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To reflect on this issue, it is useful to first refer to what one of this study's interviewees said about the history of the town square in Melbourne, in Australia:

> Historically, I believe the Speakers' Corners in Melbourne were located either in the old heritage site past the river; perhaps, at times at the State of Victoria Library on Swanson; but most notably in the Eastern market – which was called Paddy's market and was a night market that had people from all walks of life go and rant out stuff back in the nineteenth century. But none of these were public spaces or town squares. We can say that people might have used those sites as Speakers' Corners because they just did. In effect, the only official public space in Melbourne is the small City Square on the corner of Swanson and Collins.
>
> Some historical sources suggest that this is because, when they planned out Melbourne, they deliberately did not put a [public] square in because they were watching Sydney and learning from it. They did not want to encourage that people would have a place to come together to assemble. This was because authorities thought that "bad things happen" when people get together in public space…but you know, people did get together, anyway. ([E5], interview, 4 April 2014,~37min30sec)

Several historical publications confirm this. City planners deliberately made choices to discourage people from gathering in large crowds in Melbourne. Federation Square, for instance, is not considered a public site. Although the property on which it is built is owned by the government, its ownership is vested by the Federation Square management private company which is a subsidiary of the State of Victoria government. The Federation Square Management Ltd. manages the space. It has the right to forbid people to assemble on their premises, and even have people removed because it is not, *per say*, considered a public space. And in fact, Federation Square is a "programmed space" in the sense that events that take place on this site are always programmed and approved in advance ([E5], interview, 4 April 2014,~10min30sec).

By contrast, the Quartier des Spectacles' one square-kilometer district is considered to be a public space. In particular, Place Émilie-Gamelin located at the East edge of the district, has a status such that no one can be removed from this site at any time, day or night. For this reason, it is the square that is most used for street protests, vigils, events where tents are pitched and public assembly in general. This speaks to the wide range of possibilities that urban space can offer citizens depending on how it is set up, managed and regulated. The site in which Mégaphone was deployed, the Plaza des

artistes, is considered a public space, but it has more restrictions than Place Émilie-Gamelin, and is thus managed differently; like Federation Square, it is also programmed.

Among our end user interviewees, there were many different perspectives as to whether the Plaza des artistes had been the best location to deploy Mégaphone. Some thought that it should have been deployed in Place Émilie-Gamelin, while others believed it should have been at a busier intersection to be visible to more people. In particular, Mégaphone's Master of Ceremony who interacted with people onsite during all 37 nights of the deployment, had a chance to discuss this with many of the end users. During his interview, he shared his reflections on the role of Mégaphone's location:

> If Mégaphone had been deployed at Place Émilie-Gamelin, then that might have been a much more intense deployment because it is a strategic place. There are always more people there than in the Plaza des artistes, because it is more intimate, it is designed in a more open and inviting way, it is more of a transport hub and there is just generally a greater density of pedestrians.
>
> Remember that Place Émilie-Gamelin is the only public space in Montréal which is not regulated by the same by-laws as the city's public parks is. For instance, people have the right to stay in that space past eleven at night, and it also has no limits on how many people it can accommodate [in terms of density]. If Mégaphone had been deployed there, it might have helped the installation space become a place that was a focal point *over time* [emphasis added].
>
> I say this because many of the people I saw at Mégaphone came back regularly and they would always show up with some degree of expectation, asking what was on that night or why there wasn't more of an audience, etc. People began to associate the location of Mégaphone with the visibility of, and access to, interesting live speakers. Three months gave us sufficient evidence to see that we were beginning to have a regular crowd that was made up of familiar faces. But three months was not enough to assess whether people identified the site as one that was relevant to them, a place they wanted to adopt as a venue. I actually believe that if the deployment had been longer, the location for the Mégaphone would have crystallized. (L.-R. Beaudin, interview, 15 January 2014,~11 min)

The MC's perspective was supported by most of this study's interviews with end users and, especially by field observations. Whether they used its "Speakers' Corner" or not, many of the people who participated in Mégaphone enjoyed the experience so much that they came back, sometimes on several occasions. There were at least two

dozen people who regularly attended once to twice a week and came to recognize one another. Ties between these individuals were either created or strengthened through repeated attendance. On the last day of the deployment, many of them came by for half an hour or more to say good-bye to the onsite staff, to other participants and to myself – who they saw as part of the installation. In fact, this was an emotional moment for many.

For this reason, it would make sense to hypothesize that a longer deployment might have facilitated the formation of new, sustainable networks and communities. In fact, they were already forming onsite. For instance, three of this study's four focus groups conducted in the weeks after the deployment involved end users who had never met each other before the deployment but had come to know one another from meeting onsite. During the focus group interviewing, they shared their love of the Mégaphone experience, a common ground that seemed to connect them even more; many of them reinforced each other's view that it should come back. All of the twenty-one participants that were interviewed after the deployment reported that they had used the Mégaphone more than once and intended to use it regularly if it were to be deployed again. Most of them also thought that it was an important tool that could help support democratic and civic participation locally, and had had a positive effect on their desire to socially interact.

Although many interviewees complained about the location being too close to road traffic and not pedestrian enough, a recurrent idea during interviews was that the platform's situatedness brought us back to the local and away from the virtual:

> I wouldn't want the Mégaphone experience to go beyond real time and space. This is what makes it special. ([P9], focus group #3, 16 November 2014,~53min30sec)

> What is interesting with Mégaphone is that people are in that place. They are not somewhere else. Whether they are by foot, on their bike or in a car, they are physically there, in that place. And this is what defines the experience. The link between technology and people in real space and real time is an altogether different impact than online technologies. The live aspect of the platform gives it a local feel. Even if the display were networked with another screen in Paris or New York, it would still feel very local. I say this in the sense that it is the citizens of a specific city that either come to speak or to listen. So it necessarily connects you *to this city* because this is the place that participants physically are [emphasis added]. ([P5], focus group #2, 12 November 2013,~22 min)

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Such testimonies suggest that Mégaphone supported many forms of onsite interaction rather than only human-computer interaction. Users of OPENWINDOW had also remarked that their neighborhood display platforms helped create new "local" networks of interaction (Wouters, Huyghe & Vande Moere, 2013, p. 126). Similarly, many interviewees said they met and made new friends at Mégaphone, that it helped them overcome their feelings of isolation and that they felt being there allowed them to become part of its "community".

It is in this sense that situatedness can be understood as a social affordance in relation to locative platforms such as interactive digital public displays, but also interactive urban furniture. After all, O'Hara et al.'s (2003) canonical work on displays is titled "Public and situated displays: Social and interactional aspects of shared display technologies", which highlights the situated character of interactive displays. Many HCI studies on display prototypes cite location as a key factor, but not an actual affordance. This analysis of Mégaphone suggests that it might be an important *social affordance*.

Conversely, interviews conducted onsite or after the deployment also revealed an interesting idea that complements Mégaphone's situatedness. Many end users expressed the wish either to have many Mégaphones throughout the city dispersed in different neighborhoods, or else the idea of a "touring" Mégaphone that would be deployed in a series of neighborhoods for a certain period of time. This could be a week-end, a week, a month or a season. A good example of this was the idea of deploying the Mégaphone near the entrance of a different subway station every week-end. Another interesting suggestion was to have it tour outside of Montréal so that the suburbs and remote regions had access to a platform that would allow citizens to share their views.

In terms of design, what this means is that a situated display system such as Mégaphone could be produced in such a way that it could be easily dismantled and reassembled for deployment in different locations. While situatedness might constitute a social affordance, it is not mutually exclusive of the idea of mobility. Rather than having to decide whether such a platform should be situated or mobile, designers would be poised to think about, "how is this platform situated and how is it mobile?" In other words, whether it is deployed from a motorized vehicle that can change location on

demand, or whether it is taken apart and put back together like a travelling stage, design could make the platform portable. Many interviewees felt that this would improve a new iteration of Mégaphone. They wanted Mégaphone to reach more people but instead of proposing that it be bigger in scale, they imagined it as modular platform that would be accessible to different localities, symbolically connecting citizens through common use.

5.2.7.   Social Affordance: Architectural Scale vs. Immersive Intimacy

In counterpoint to these perspectives, field observations and other interviewee testimonies seemed to suggest that scale was also a social affordance. As previously discussed, Mégaphone's monumental media façade deployed in a real public plaza restructured that space and brought added value to it by enabling real time co-located digitally-augmented experiences. Accordingly, people did not use the giant public screen to self-publish in the same way as they would self-publish online. Many described this monumental interface as an "enhancing component" (L.-R. Beaudin, interview, 15 January 2014,~8min). In fact, within public space, all of Mégaphone's components functioned to amplify output. For this reason, this study proposes that scale can be construed as a social affordance when it is operationalized as a concept that relates to amplification rather than merely to physical size: scale as a measure of expansion facilitated by interactive interfaces, as was the case with Mégaphone.

One can see this more clearly if we take Mégaphone's audio interfaces. While the monumental media façade made the speaker's words publicly visible to many, the sound amplification devices made them audible from far away, even though their output was not exposed around a tangible surface. As it resounded throughout public space, the speaker's voice attracted passersby to the agora and functioned as a motivation for others to use the microphone, as observed in the field and confirmed by this study's interview data. The monumental façade also did this by appealing to people's sense of vision. Similarly, the urban furniture and responsive lighting synergetically enhanced these effects. Altogether, these multimodal interfaces amplified the speaker's presence, creating the illusion of an immersive space, whose exact scale is determined by

interactions. Indeed, one could say that the input/output interfaces worked to expand the space in which the speaker's presence was seen, heard and felt.

End users responded to this particular affordance as a *means* to engage. For this reason, this study argues that the sense of power that resulted from having one's voice, transcribed speech or physical presence amplified was of a different order than the social affordances of co-locatedness, publicness or embodied interaction. Many expressed this sense of expansion of their presence in the installation space using a vocabulary that stressed a sense of "power" and "empowerment". For instance, one user said, "I feel powerful when my voice is amplified throughout the plaza and my words appear big on the façade" ([P11], interview, 21 November 2013,~3min30sec), while another noted, "loud sound can be a powerful way to attract people in the space ([P12], interview, 27 November 2013,~1h16min).

Conversely, some people reported feeling dwarfed by the monumental scale of the larger media façade, "It made me feel very small.., I felt tiny in relation to the large projection" ([P12], interview, 27 November 2013,~45min). Thus, scale was not only a matter of expanding one's presence. In fact, scale as a social affordance might be best understood as a design factor that puts one in relation to system components, interfaces and people in the installation space. In other words, scale is a social affordance because it can be experienced as a way to compare oneself to something other. It puts us in relation to something, and although this could be understood or analyzed in terms of an embodied interaction experience, this study purports that it warrants its own category as a social affordance for design.

This is not to say that scale is not a physical feature. It is noteworthy that the video projection aimed at Mégaphone's monumental media façade spans almost an entire city block over the street facing side of *Université du Québec à Montréal*'s President-Kennedy building. This is evident on Figures 3.20 and 4.6. But what is perhaps more remarkable is that human-computer interaction at Mégaphone's "Speakers' Corner" expanded the size of the installation by making it audible and visible beyond the installation space. Indeed, after a programmed performance by Montréal spoken word artist, Rae Spoon, one of this study's onsite interviewees, explained that

she thought the art installation had helped Spoon's performance better reach the audience in the agora because, "it's just big and it's loud" (onsite interviewee, interview, 7 September 2013).

The social reach of scale was also manifest during the evening of Wednesday, September 11, 2013 at 9 pm, when Equiterre's Steven Guilbeault gave a comprehensive programmed presentation on the rationale behind the pipeline project that Alberta-based corporations were planning to build to bring oil to Montréal from Canada's tar sands. For almost 45 minutes, Guilbeault weighed the pros and cons from an environmentalist perspective. Although the sky was overcast with drizzling rain, this scheduled intervention started with 19 people sitting in the agora. Many pedestrians and cyclists would stop and listen for 10 to 20 minutes, and then go on their way. Some stayed to listen until the end. The last fifteen minutes of this session was dedicated to answering questions from audience members. At that point, there were 32 people in the agora.

What was apparent during that hour is that people were really drawn in by Guilbeault's presentation. Whether they stayed for just ten minutes or the whole session, there was a constant flow of people that were extremely attentive to what was being said. It is true that the presenter was clear and eloquent, but the way people kept coming into the agora space from the street was made possible by the amplification of his voice which expanded his presence. Indeed, the whole installation space attracted people's attention. This was not only due to the visibility of the media façades in the pitch of night, Instead, the installation as a whole commanded attention. The more people entered the agora space, the more other passersby were attracted to it. Thus, this study suggests that scale might be understood as a social affordance if it can expand space and presence enough to support the "honey-pot effect" and other social affordances.

To put it otherwise, one interviewee told us, "With Mégaphone, digital technology is not getting in the way of people interacting. Rather, it is amplifying the communicative process by making the voice louder and projecting their words onto the screen. If anything, it is a tool that slowly breaks down the barriers between people" ([P5], focus group #2, 12 November 2013,~45 min). This can be related to Bachelard's (1964) idea of "intimate immensity" (Chapter 8), which draws on the phenomenological tradition, and

then tied in with the concept of the Romantic Sublime in fine arts. In *The Poetics of Space*, Bachelard (1964) writes:

> …immensity is within ourselves. It is attached to a sort of expansion of being… (p. 184)

> …the exterior spectacle helps intimate grandeur unfold… (p. 192)

> …the two kinds of space, intimate space and exterior space, keep encouraging each other, as it were, in their growth... (p. 201)

The sublime has its origin in Ancient Greece where it described a quality of writing so great that it could inspire a sense of ecstasy in readers. In the 18th century, the philosopher Edmund Burke (1792) took it up in a famous treatise on aesthetics to describe a type of beauty that was to become highly influential in Romantic poetry and art, which celebrated themes of grandeur, magnificence, nobility and most especially the awe inspired by the immensity of natural landscapes. The landscape paintings of Caspar David Friedrich, Thomas Cole and Joseph Mallord William Turner offer examples of this.

In a more general way, the sublime has been used in aesthetics to describe the awe and fascination experienced in the face of something great and spectacular: nature, machine and technology. Russian Constructivism's and Futurism's celebration of the beauty and power of the industrial machine are akin to this concept and describe one view of what is meant by the term, the technological sublime. There have been countless other philosophical reflections on the sublime, but a literature review of these would fall outside the scope of this dissertation, which draws on Kant's (1951) definition of the sublime to describe it as a phenomenological experience that expands the boundaries of the self and stands beyond the limits of a single sensory modality, a sort of Gestalt of the senses that elevates the mind and brings it into resonance with the real world environment as a whole. This is more powerful than crossmodal or multimodal experience in that, in keeping with Kant's definition, the sublime is an experience that is *beyond the threshold of the senses.* We are *pulled into* the vast spectacle before us.

Here, "intimate immensity" and the sublime are described to make a point about Mégaphone. Its architectural scale is an attribute that affords it a potential for interaction that is distinct from other computational platforms. It is in the somatic character of its

scale, and of the scale of the environment it becomes *when it is used*, that it can provoke a heightened sense of awareness, a gestalt experience akin to the sublime. In this sense, emphasizing large scale and height in design, and interfaces that "amplify" might be a design factor that supports new forms of immersive, embodied social interactions. But the sense of immersiveness is also a matter of feeling enclosed within a circumscribed space of action, and this is why, once again, the design orientation might best be thought of as "the room within the room" that was Lloyd Wright's trademark.

5.2.8. Social Affordance: Emergent Happenings vs. Programmed Interventions

One of the most appealing aspects of the Mégaphone installation was the unpredictability of its monumental media façade. Because the speech recognition software did not transcribe the spoken word with one hundred percent accuracy, it was impossible to know which words would appear and which ones would not. Further, one never knew where a word might appear, how big or small it would be and what other words around it would be visually and thus, semantically, associated to it. Another fortuitous feature of the system was that in sleep mode, French and English words were usually jumbled together across the display. All this speaks to one of the key aspects of Mégaphone that was best described by its Master of Ceremony during his interview:

> What struck me the most about the installation was that I could never effectively anticipate what was going to be said and what was going to happen. It was not only *often* surprising, it was *always* surprising. I think that this had to do with the fact that once someone decided to take that microphone, we all knew something was bound to happen: whether it was a small thing or a big thing, an intimate gesture or a far-reaching initiative, and whether it was about one's individual interest or the common good, what was being said, always had an element of surprise to it. Those of us listening in the agora each found our own moment of resonance with what the speaker was saying. And this was happening every evening, no matter who was speaking or what was being said. There was always some kind of impact on people, on public space, on passersby, or on those who stood there, compelled to go up and say something too, but often never dared to. It was a context that gave us a sense that anything could happen and that people made this possible. (L.-R. Beaudin, interview, 15 January 2014,~6min)

What Beaudin alluded to during his interview was that – in his opinion as an observer that had been present every evening of the deployment – Mégaphone's most remarkable social affordance was that, like the monumental façade, it was the space of possibilities. This was not an affordance driven by the system, but by human behavior. By virtue of this, said Beaudin, "we could always *expect the unexpected* [emphasis added]." (L.-R. Beaudin, interview, 15 January 2014,~4min30sec).

What Beaudin describes echoes the words of Lozano-Hemmer when he explains the impact of his own interactive art installations, which he calls "relational architecture":

> The real motivation behind relational architecture is the modification of existing behaviour', and generating unpredicted, chaotic, emergent behaviours by creating 'a situation where the building, the urban context and the participants relate in new, "alien" ways. (Lozano-Hemmer qtd in Bounegru, 2009, p. 205)

This study calls such a social affordance "emergent happenings" because they are, on the one hand, emergent, and on the other hand, they are events generated by people. Because they are happening in real time and real space, it is not enough to call them events, however. The term "events" is too often used to describe online or virtual actions. The term "happening" seems more appropriate here because it emphasizes an event that is actually taking place in real space. Allan Kaprow and the Fluxus art movement of the sixties gave the word happening its original meaning in the context of art as performance and art in the context of everyday venues (Kaprow, 2003, pp.18-20; pp. 62-64). And this is the social affordance that both Beaudin and Lozano-Hemmer are evoking in their descriptions. Beaudin further explains:

> The space creates a rift, but at the same, it also creates a connection between people. This is a result of the effect produced by people coming to voice out their opinion: it means that we, as an audience, are confronted with new ideas, with other ideas and this creates a break in one's consciousness, but it is soon followed by a suturing of this breach, and this process is how we learn from others. I learned so many incredible things not the least of which was to become aware that so many different people existed, so many different ways of seeing the world, of experiencing it and of putting it into words. This was the risk we ran, but it was also the way to overcome our fears of others […] it was like a flee market or an antique shop: you had to be there, be patient and be

attentive to find the pearls. (L.-R. Beaudin, interview, 15 January 2014,~1h01min)

I recall an evening when one of these pearls was exposed to the public eye. It would be impossible to recreate this event and the impact it had in this public space. Perhaps, this is why it is best described as a "happening". It took place the night of Saturday, September 7, 2013 on the heels of scheduled interventions by almost a dozen poets of the Montréal Slam League, led by local performance-poetry artist, Ivy.

Nineteen people were in the agora when the show started at 9 pm and seventeen were left by the end of it. But during most of that hour, there was a steady audience of about thirty people, with about a third coming off the street to join the audience for a while and then leaving after a few poems. For instance, halfway through, there were 33 people in the agora. During the show, I noticed that people in the agora did not pay attention to the media façades but many people coming in from the street were drawn in by them and the spoken word that was rhythmic and poignant.

The surprises came after the last slam performer hung up the microphone. The next hour had not been reserved, which officially made it an open mike session, but it was interesting to see how many of the interventions segued from the slam performances. First, a homeless man walked up to the "Speakers' Corner" platform and eloquently slammed improvised poetry about Québec culture in the sixties. His performance was followed by a group of eight European tourists who took turns singing *a capella* duets in the microphone. Then, a Canadian of African descent came to the mike to say that Mégaphone was like the palaver tree that is found in every African village. He explained that the palaver tree is a tree of majestic stature under which villagers stand to tell stories, talk about problems, raise new issues, initiate discussions or talk about anything to whoever will listen. The man said, "This place is like our village tree where everyone has a right to speak publicly and no one can silence them" (Canadian man, onsite observations, 7 September 2013).

Later that evening, followed one of the most compelling interventions I witnessed. A middle-aged woman in a mobility scooter who had quietly sat through the slam poetry performances, made her way up to the "Speakers' Corner" platform in her motorized

wheelchair. Once she arrived on the platform, she had to stand up because the wooden edges of the platform blocked the wheels of her scooter. She walked up to the microphone and while holding onto the pole, she started to relate the very personal details of her story. She explained that she had given up her son for adoption twenty-five years earlier because she gave birth when she was quite young and alone. After the baby was born, she fought in court to get him back and raise him. After a few weeks, she won her legal battle and, as a result, she did raise her son alone. She talked about some of the difficulties she went through since then. Her long story ended when she told the audience that her son had recently expressed his gratitude to her for having fought to get him back and raised her. While her story could be heard across the plaza, many of her words were displayed on the media façades. Although there were few people that bore witness to her story – at that point, about fifteen people were left in the audience – her testimony was incredibly poignant and moving because it was such a private sentiment that was being shared in an unexpected context. Her testimony had a different reach than a televised interview would have: the live, improvised aspect gave it *gravitas*.

There were many such interventions at the Mégaphone, where people shared personal anecdotes or feelings in a spontaneous and generous way. At times, this took the form of improvised props being included as part of the intervention. For instance, the evening of the Greenpeace vigil on Saturday, October 5, 2013, small glass jars containing lit candles were placed in the front part of the agora at 7 pm before the intervention began. Similarly, at the same time on the evening of Wednesday, September 25, 2013, as seen on Figure 5.7, bright red feathers were strewn on benches in the agora space before Mélissa Mollen-Dupuis's scheduled talk as a spokesperson for the Quebec branch of the *Idle No More* First Nations initiative. As Beaudin noted, it was this kind of unpredictability at the "Speakers' Corner" or in the agora that made the place magical for all those who came to know the Mégaphone, and who came back because of this social affordance: it made space for people to generate emergent happenings.

Based on field observations and interviewing conducted during the deployment of the Mégaphone, programming seems to be one of the principal design challenges in public interaction. On evenings when there were too many scheduled interventions or when speakers were celebrity figures, people tended to behave more like passive

audience members than participants; they would simply observe the interventions which meant that there was less social interaction or active engagement with the system. Conversely, too little content curating sometimes left visitors wondering what to do; when it was simply put at the disposal of the general public, the installation often seemed too intimidating. For this reason, the presence of the Master of Ceremony played a far more important role during open mike sessions than during planned events that he would merely introduce. The interaction scenario seemed optimal when Mégaphone was set up as an installation *to be discovered*. Such conditions create an entry point while it does not get in the way of people interacting with one another and lets people free to choose their level of engagement with the space and the artifact.

5.2.9.   Social Affordance: Public Streaming vs. Public Archiving

Recall that, in the previous section, one man compared the "Speakers' Corner" to a palaver tree under which anyone could talk to the urban "village". Proceeding by association, the speaker that followed – a man who identified as Haitian – suggested that the monumental media façade was like a *daziboa* "on which anyone could post their ideas" (Haitian man, onsite observation, 7 September 2013). Dazibao are big-character posters that were publicly posted in China on city walls in the second half of the twentieth century. They could be published anonymously or signed by their author; as a single piece or as multiple sheets; in small or broadsheet format; and as short as a poem or as long as a book. Because the content of daziboa was often a critique of the political regime in power and because it "attracted readers as well as open-air discussions and speeches", in the late nineteen-seventies, one 200-yard brick wall in Xidan covered in dazibao became known as the "Democracy Wall" (Downing, 2001, p. 171). Although they were ostensibly intended to be vehicles of popular expression produced by contributors of "humbler backgrounds", masses of dazibao were also often tactically used by one elite faction to mobilize public opinion against another (p. 172).

Like the wide span of Xidan's Democracy Wall, it is surely the sheer size of Mégaphone's monumental media façade that prompted a speaker to compare the larger digital display to a dazibao. In fact, these public media postings share three important characteristics. The first, as noted, is that they can be used, either by radical or

subversive groups or by an authority in power, sometimes simultaneously; a display wall showing a mix of views or including advertisements provides an example of this. The second is that they can appeal to a mass of people moving through public space, yet they have less in common with "mass media" than they do with online platforms because anyone can use them to self-publish. The third is that they often serve as a catalyst for the production and spread of other unofficial publications, as noted by Downing (2001), and as I saw with Mégaphone in the context of onsite observations (p. 171).

For instance, some small groups made strategic use of the monumental media façade during their scheduled session at Mégaphone. They carefully documented the situated intervention onsite with digital recording devices and later posted them online, which allowed other individuals or groups to access or add to the online publication. Here, the images and commentary posted online can extend the life of an intervention. This also calls to mind one of the social affordances of a platform like Mégaphone, used alone or in tandem with the Internet: it allows people to inscribe words in public space.

A case in point is illustrated by Figure 5.8, which shows some of the eleven sessional lecturers who hijacked the monumental media façade for a whole hour on Friday, November 1, 2013 as of 7 pm to protest against the precariousness of their professional status. This was a scheduled initiative that was never reserved on the official Mégaphone website; instead, it was announced on the union's Facebook™ page, nine days in advance under a short post titled "the SCCUQ occupies public space".

The seven-paragraph copy of this announcement ended with an invitation to "Come join us in speaking into the Mégaphone and run the chance of having your uttering of the words 'precariousness'; 'quality'; 'pride'; 'teaching'; and 'contempt' be displayed on the frontal façade of the UQAM President-Kennedy building". What was surprising about their particular intervention in comparison to the others that I had observed was that end users were far more concerned about filling up the façade with certain words and then recording images of how those words were displayed on the façade than they were with actually addressing a live audience. In addition, although, many other groups who did similar interventions published the audio-visual recordings of their intervention on the Internet, the SCCUQ never did. But the fact that they

passionately engaged in creating these images as seen in Figure 5.9 is of great interest because it speaks to the idea that occupying the public space around Mégaphone may have been partly an exercise in playful self-representation, self-publication and self-archiving: in short, leaving a digital footprint in three substantially different ways.

Indeed, every word that appeared on the monumental media façade in live mode was also permanently inscribed into the database for potential display in sleep mode. Many of the end users came to know this about Mégaphone, and for some, this served as a purpose or motivation. As one of the interviewee remarked, "I think the visuals of the large façade transform each performance into a historical moment because this technology allows for the archiving of the spoken word" ([P8], focus group #3, 16 November 2013,~6min), while another believed that, "some people used the façade specifically as a means to project words…the façade was the means and end to some interventions" ([P10], focus group #3, 16 November 2013,~19min25sec). Others saw it as a means to make a physical mark "it was a way to say I was here" ([P9], focus group #3, 16 November 2013,~30min) and "the fact that our spoken words are inscribed on the façades and archived in the database gives the speakers' interventions a material form in public space but it also leaves a visual trace we can then photograph" ([P7], focus group #3, 14 November 2013,~24min).

Indeed, many interviewees used the words "trace" or "mark" to describe how the installation allowed them to inscribe their visible and audible presence in an urban space in which they would usually feel anonymous, invisible and transient. But overall, few end users harnessed the power of Mégaphone to archive a permanent public record of their spoken word. During his interview, the Master of Ceremony expressed the fact that people failed to use the archive was one of his disappointments during the deployment:

> I think that the database was a really important part of the installation and yet it remained underused, possibly because people didn't realize how it worked. I feel that this may have been a missed opportunity to do something really meaningful. You know, as a Master of Ceremony, this was what I was most enthusiastic about and this was what I was trying to entice people with during open mike: I promised people that if they spoke into the microphone, their words would be archived and then after three months, we would take stock of what had been said. And the words that had recurred most often in the system would reflect the common themes

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that people cared most about in this city. This is what it means to live together. (L.-R. Beaudin, interview, 15 January 2014,~8min30sec)

Here, the Master of Ceremony is deploring that the full potential of this social affordance – the live performative streaming mode vs. the archival sleep mode – was often ignored by Mégaphone end users. During his interview, he further suggested that the designers and the producers had not made efforts to strategically promote it, and thus help to develop it as a key design feature; he was particularly disappointed that a proper content analysis of the most frequently spoken words recorded in the database was not published at the end of the deployment as had been announced in the promotional material for the launch of Mégaphone:

> The documentation and recording of the spoken words is what I thought was the highlight of this deployment, but it seems to me that it remained unfinished business. I think someone should take this up and do something with it. Because the article that summarized the content of that database had nothing to do with what really happened at the Mégaphone. I have terrific respect for the public figure who wrote it up, and had high expectations, but when I read it I realized that any regular participant could have done a better job at unpacking this archive. (L.-R. Beaudin, interview, 15 January 2014,~8min)

The article that Beaudin was referring to is, in fact, a piece written by a UQAM philosophy professor and regular contributor to Montréal's only independent daily newspaper; he was assigned to conduct a qualitative content analysis which appeared in *Le Devoir* two days after the deployment had ended (Seymour, 2013). In this article, the scholar makes the following very brief quantitative content analysis: data results that were likely transmitted to him as they appear.

> On (6377 occurrences)-je (5088)-il (3603)-nous (1680)-vous (3342)-you (1483)- dire (1028)-peut (1178)-être (1030)- Montréal (1187). Il s'agissait en effet de dire ce que pouvait être Montréal, mais aussi plus généralement la ville (724), le Québec (327), les Québécois (127), le passé (311), le pays (304), la politique (194), la société (157), l'histoire (137), la culture (133) et le Canada (141). (Seymour, 2013, para 2)

The rest of the 1000-word article is an intellectual essay that expresses very personal views about the city, the province and Québec society. Its substance is completely unrelated to the real relationship between the spoken words and the archived

words in the context of the Mégaphone deployment. This is not surprising since Seymour, a respected Québec intellectual, seldom attended interventions. His analysis as a third-party and humanities scholar was highly abstracted from empirical data.

This speaks to the importance of using inductive approaches to study public interaction and interactive technologies in real urban space. The only two people that attended the Mégaphone sessions over the course of the whole deployment were the Master of Ceremony and myself. This gave us both a context to reflect on the possible meaning and function of the Mégaphone database's very unusual method of public archiving. Although as an ethnographer, my view is biased and my narrative account can only be a partial text, it is by virtue of my role as a participant observer that I made first-hand observations, which I then compared to other perspectives through interviewing a large number of participants onsite and *post hoc*.

As I slowly became immersed in this installation space – watching interventions for at least four hours every night and recording them with field notes, photographs and videos – I delved deeper and deeper into the world of possibilities that the back door of the system's design opened up for new forms of public interaction to emerge. As Lupien and the design team at Moment Factory had expected, it was the end users that would imagine these possibilities and instantiate them through creative appropriation. But unbeknownst to the design team, my field findings clearly showed that it is the relationship between the live performances that emerged at the Mégaphone and the possibility of archiving these performances by one's own means that held the key to unique forms of public interaction. The next chapter offers thick description of four distinct interventions that highlight different ways in which end users creatively leveraged this particular social affordance. The research results are presented as examples of design-in-use that propose alternative purposes for interactive public displays.

Chapter 6.

Appropriating the Mégaphone: The User as Designer[11]

Architecture has never been idle. Its history is more ancient than that of any art, and its claim to being a living force has significance in every attempt to comprehend the relationship of the masses to art. Buildings are appropriated in a twofold manner: by use and by perception. (Walter Benjamin, 1969, p. 240)

Suggesting that the hermeneutics of technology go hand in hand with how social beings choose to make use of tools, devices and systems, Feenberg (2000) has argued for the importance of developing new theoretical approaches that could support nonessentialist conceptions of science and technology. By calling upon scholars to imagine, recognize and remain critical of the unexplored possibilities of technological innovations, his work has sought to revitalize the philosophy of technology with some of the basic precepts of critical theory to refocus its lens around issues of power and agency (Wyn Jones, 1999, p. 85). Feenberg attempts this by bringing to bear the "social and historical specificity of technological systems, the relativity of technical design and use to the culture and strategies of a variety of technical actors", thus privileging a constructivist approach over a substantivist or essentialist one (Feenberg, 1999, p. x).

To illustrate what forms this can take in social life, Feenberg (1995) discusses how 1980s "Minitel" subscribers appropriated a computer-mediated communication technology – namely, the French Teletel system – to serve their own means and ends. In 1982, communities of users began to hack the service to create personal messaging sex lines, a use of the system which later came to be referred to as the "pink Minitel" (pp. 150-151, 158-161). A few years later in 1986, French students appropriated these same Minitel terminals for political ends by using them to organize a national strike – an event cited in the literature as possibly one of the earliest cases of people "actualizing the

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potential for a more participatory society and oppositional forms of social organization" through the appropriation of a digitally-networked technology (Kahn and Kellner, 2008, p. 24). Such examples suggest that creative appropriation is a practice that allows people – across traditional categories of class, gender and race – to socially recontextualize technological commodities in order to better serve their private purposes in everyday life. Feenberg (2000) describes this appropriative process as a form of "secondary instrumentalization", which makes it possible for people to recover technological artifacts to construct alternative hegemonies and ways of being in the world (pp. 308-312).

Indeed, since the Minitel examples, much has been written on how micro-publics have formed and come to mobilize by subverting widely available new media platforms. For instance, in their empirical study on the use of social media during political protests against the Mubarak regime, Tufecki and Wilson (2012) discuss works that examine the important role satellite TV news channels (e.g. Al-Jazeera), online social media (e.g. FACEBOOK™ and TWITTER™), and devices (e.g. mobile phones) played in transforming the Arab public sphere in the past decade (p. 365). These readings of how media technology has been appropriated in the Middle East and North Africa are not new, nor are they specific to new media. Fanon's (1965) postcolonialist work, for instance, describes how the radio receiver set was, first rejected, and later adopted by Algerian natives to construct a collective consciousness against colonial domination in the early 1950s. Written in the 1960s, his account seems more nuanced than much of the "Arab Spring" literature that arguably tends to promote liberal social forms and democratic values as the gold standard. Rather than universalize the appropriation of the radio and the creation of the *Voice of Fighting Algeria* broadcasts to a Western teleology, Fanon clearly situates their use within the patrilineal values of traditional Algerian society, thus suggesting the greater pliancy and potentials of secondary instrumentalization. As these empirical works suggest, in-the-wild observations of the appropriative process seems paramount to developing the full potential of communication technology.

The case studies in this section investigate the creative appropriation of Mégaphone in a similar socio-political context, that is, as a way to harvest the emancipatory powers of new technologies of representation. All pay homage to Benjamin's (1969) belief that new forms of consciousness can, and should, emerge from

their design (pp. 235-240). At times, the analyses grapple with very similar issues as the "Arab Spring" corpus: power differentials, discrimination, the occupation of space, the use of media for purposes of resistance and the interdependency of multiple online and offline sites of actions. However, because it describes interventions set in a Western democracy rather than in an authoritarian regime, it may offer a fresh perspective on the implications of appropriation in a political tradition that upholds the classical liberal principles of free speech, right of assembly and the rule of law. The examples of design-in-use they suggest might too be adapted for the rapidly changing needs of urban living.

6.1. Multisited Design as a Methodology to Observe and Imagine New Designs

While this study's main objective was to make *in situ* observations about how people creatively appropriated Mégaphone and its units of analysis consisted of individual participants and groups of users, its actual object of research was not only multi-sited, it was also multidimensional in that it consisted of physical, virtual and imagined phenomena that were often interconnected. To describe the trajectory of such phenomena, one must trace each digital practice across multiple sites. Marcus (1995) describes this as: first, "follow the people and follow the thing across sites" (pp.105-110); second, show the relationships between these multiple sites (p. 102); third, tease out the comparative dimensions that are integral to them (p. 102); fourth, (re)define the object of study (pp. 104-105). The examples of design-in-use in this section are a result of this dialectical and reflexive process, a process that remains both open-ended and speculative because it consists in constructing the objects of study "by simultaneously constructing the discontinuous contexts in which they act and are acted upon" (p. 98).

This doctoral dissertation argues that the power of a multisited approach applied to HCI design lies in this constructionist research task. As Crotty (1998) writes, "what constructionism claims is that meanings are constructed by human beings as they engage with the world they are interpreting" (p. 43). The theorizing of observed design-in-use are thus constructed meanings adapted from imagination. Accordingly, the four case studies presented in the rest of this chapter emerged as much from the production

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of this ethnographic text, as from the end users' design-in-use during the deployment. This is one way through which a participant observer can engage with doing design.

None of the stakeholders or interviewees involved in this research had openly stated that the Mégaphone was a live social media site, a commemorative monument, a news production platform or a crowdfunding tool. These imagined designs were the product of the multisited interpretation of the field data; they are stories being told: they are subjective constructions based on fieldwork. Presented in the same chronology as the deployment, the evolution of these narratives also show how I gradually became more deeply involved as a participant observer, and how, as a result, multisited design fieldwork created a unique opportunity to actively participate in imagining and shaping the fourth and last of these case studies, namely the live crowdfunding platform. In the following, the ethnographic text increasingly adopts a first-person narration mode while it continues to shift back and forth between the empirical data and extant theory.

6.2. Demonstrating Four Public Interaction Strategies With *and* Without Connectivity[12]

Once the National Film Board of Canada had launched the official Mégaphone website in mid-July 2013, its "Speakers' Corner's" programming schedule began to fill up as individuals and organizations reserved their time slot. Out of the 96 sessions of the ten week deployment, 54 of them were reserved by end users who had prepared their interventions in advance. The 42 others were open mike sessions which could last between one to four hours. It is noteworthy that 4 open mike sessions were spontaneously used to present unscheduled, but well-prepared interventions: a municipal party used it to present their political platform before elections; an elected politician delivered a speech in response to an imminent crisis; local activists made a guerilla-style appearance during the Greenpeace Arctic Sunrise case; and, as we saw at the end of the last section, a local teacher's union staged an *impromptu* intervention to denounce unfair working conditions. With the exception of these, open mike – which is defined as an empty time slot that no one would claim or reserve – were used for free play; and, *this* is when creative appropriation typically tended to take place.

As was established in the previous section, the research design for the 37-day Mégaphone field study categorizes levels 0 to 5 of the public interaction framework shown in Figure 2.7 within the baseline use of Mégaphone, while levels 6 and 7 are considered above the baseline. Level 6 construes the users as designers insofar as they re-organize, remix or relay content. Level 7 considers users as meta-designers to the extent that they hack or appropriate the system. Although levels 0 to 7 apply to all the cases presented in this section, it is the emphasis on actions categorized as levels 6 and 7 that sets these interventions apart as exemplar cases of creative appropriation.

What follows presents only four case studies of how end users appropriated Mégaphone. They have been selected because, first, they are deemed to be particularly meaningful gestures; second, they suggest that thick descriptions of specific usage can say something deeper and unique about how an installation is used in unforeseen ways; third, they each propose a new function for interactive public display systems; and last, together they demonstrate the following *four public interaction strategies*: (1) self-representation; (2) self-publication; (3) self-archiving; and (4) self-promotion. These are not new concepts. Indeed, it is true that the majority of online digital systems have typically supported these for a number of years as we will see. But the narratives presented in this section also show examples of how these strategies can be deployed *without connectivity*, in real time, in real space and in the context of public interaction.

6.2.1.   A Live Social Media Site

Over the ten week deployment, one of the most salient field finding was that many people who used the Mégaphone came back regularly to use it over and over again. Even on evenings when there were only a few people, almost everyone I interviewed said that their experience of the Mégaphone met a need that existing digital systems had not yet fulfilled. For instance, most interviewees expressed that they appreciated having access to an interactive platform that allowed them to see people talk about themselves in personal and intimate ways, to hear them voice their opinions live and to have a chance to be around strangers in a public setting that supported different levels of interaction. The installation enabled users to meet new people and get to know them through shared use of the system, which suggests that if the deployment

had been longer, we might have seen networks of friends begin to form onsite around common interests. Given that Mégaphone was not connected to the Internet and thus such technologically-mediated relationships in urban space are distinct from online digital communication, this narrative suggests that it might provide an interesting model for how locative technology could support a new type of offline live social media site.

To illuminate this idea, it is helpful to link this finding back to the literature for the purpose of substantiating the analysis: the Mégaphone installation may have functioned as what Oldenburg and Brissett (1982) describe as a *Third Place*, that is, a place which can provide "opportunities for experiences and relationships that are otherwise unavailable" (p. 270) and "arenas for active participation with others" (p. 275). According to Oldenburg (1999), the Third Place is a public social space that allows people to form relationships beyond their private home (First Place) and the workplace (Second Place). Although it is beyond the scope of this doctoral dissertation to argue that Mégaphone may have hypostasized a Third Place, enumerating Oldenburg's eight criteria for what constitutes a Third Place as analyzed by Ludwig, Stickel and Pipek (2014) helps to further imagine what an offline live social media site could be like (pp. 3-5). Oldenburg's (1999) Third Place is a space characterized as neutral ground (p. 22), conversational (p. 26), inclusive (p. 24), accessible and accommodating (p. 32), used by regulars (p. 33), plain and low profile (p. 37), playful (p. 38) and a home away from home (p. 42).

Evoking Oldenburg's (1999) Third Place paradigm to orient the design of interactive digital public displays is not a new idea. There have been many prototypes and studies produced on this subject. For instance, McCarthy, Farnham, Patel, Ahuja, Norman, Hazlewood and Lind's (2009) COMMUNITY COLLAGE (COCOLLAGE) is a large display designed for a small café of Seattle's University District to test whether a board that accommodated photo and text sharing could help foster a stronger sense of community and third place attachment amongst café patrons. The study found that COCOLLAGE did not necessarily instigate new interaction, but that it did make patrons more aware that they were sharing space (p. 234). In addition to this, there have been several other similar studies that have followed since, including Calderon, Fels and Anacleto (2014), Cheverst, Taylor and Do (2014), as well as Ferreira, Anacleto, Colnago and Bueno (2014), to name a few.

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With this in mind, this first case study aims to shows how an interactive "Speakers' Corner" has the potential to support new forms of social and political participation in public space. But are they really new forms? For many years now, it seemed that technology-mediated social participation had been the purview of online social media sites supported by connectivity. After weeks of field observations, I was poised to keep asking myself the same question over and over again: Had social media had an effect on the way people communicate face-to-face in public space? Because it often seemed like people would use the installation space as a live social media site during open mike sessions. Perhaps Mégaphone now *provided a new technological context* for certain types of exchanges in augmented public space, instead of online.

Supporting Dialogical Interactions in Urban Space with Digital Augmentation

It was not unusual during open mike sessions to see people sitting in the agora come up to the mike one after another to respond to each other's comments and engage in forms of interaction that can be compared to threads of comments that follow a FACEBOOK™ post. Prior studies mention this phenomenon of *role rotation* that was often witnessed during interaction with a comparable onsite kiosk linked to an online database (Schiavo et al., 2013, p. 51). But what differentiated those kiosk interactions with the ones that took place at Mégaphone is that in the latter, interactions were happening live *between people onsite*. Individually or in small groups, people would walk up to the mike and share content with whomever was present in the agora or on the street: a short news item; important facts or events that had not been announced in mass media channels; their latest favorite film, show, band, book, piece of poetry; personal anecdotes; and their current status expressing how they were feeling or what they were thinking at that moment. In response, people in the audience responded by applauding or nodding after each intervention, mirroring how people might typically use the "like" feature on FACEBOOK™.

The first time this happened was on the evening of September 12, 2013 after Ianik Marcil, a guest expert programmed to speak that evening, gave a talk on "economic democracy". During this 20-minute intervention, many passersby would stop to listen or even sit in the agora. In the hour that followed, seven people came to

comment on the subject of his talk. The first man explained that he often felt hopeless and wished that society invested in people rather than in progress. The next speakers built on this same idea. By the end of that one-hour time slot, there were about 30 people in the agora; most stayed for the following programmed intervention.

During the next session, ten university students from *l'École Urbania* presented their ideas on how to live well in one's community. Following this 30-minute presentation, there were 48 people in the agora during open mike. Again, audience members came to offer their opinion on the topic, but this time, the "discussion thread" segued into far more personal commentaries. For instance, one person spoke about how people should be friendlier to one another, less judgmental and more supportive. One at a time, several people responded to this by giving concrete examples to support this idea (i.e. we should smile, say hello, never openly pass judgment, etc.). Of the seven audience members that had spoken in the previous session, five came to speak again, sometimes several times. In addition, six new people came to speak. All in all, two spoke once, seven spoke two times, two spoke three times and two spoke four times, much like the way a FACEBOOK™ discussion thread tends to show exchanges between a subgroup of people. It is noteworthy that these interactions typically occurred during open mike sessions, *but on the heels of a scheduled intervention that had already primed a topic.*

> What I liked about Mégaphone was the social aspect of it. I thought that it was really cool to have this big installation that people could use for whatever purpose. When I came that night, I saw a presentation that seemed pre-planned, but when I went up there and told my story later on, well that was completely improvised. ([P1], focus group #1, 6 November 2013,~14min45sec)

Although it always took a different form, this phenomenon occurred several times over the course of the deployment. In fact, moments when the "Speakers' Corner" was used for these face-to-face dialogical interactions were almost always preceded by a scheduled intervention that formally presented a critical perspective on a current event, be it of a political or cultural nature. Again, this presents similarities with how people start a discussion thread on social media by posting their editorial comment over someone's post on their FACEBOOK™ timeline or TWITTER™ feed. However, some interviewees expressed strong views about how *the discussion thread was what really mattered*:

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My biggest concern is that once people already in the limelight get wind of Mégaphone, they will want to take it over as one more of the tribunes that they can invest. But I think that it is far more relevant that ordinary people – those who are not usually given a voice – come and say something. It seems to me that this is what Mégaphone is for. This is why I think that open mike sessions are so important. ([P8], focus group #3, 16 November 2014,~1h00min45sec)

It is noteworthy that people who had participated in these events tended to come back regularly, once to twice a week. There were even *lurkers* who would watch hours on end, almost invisible in the shadows at the back of the installation space as seen in Figure 6.1. Preece and Shneiderman (2009) describe online "lurking" as legitimate forms of peripheral participation such as reading and other activities "that do not produce a visible contribution" (p. 17). The Mégaphone lurkers were generally quiet during their first visits, but after weeks of regular attendance, they would timidly try out the microphone on nights when attendance was low. Over time, many showed increased confidence by speaking before bigger crowds. When interviewed onsite and *post hoc*, one said that over time, he had begun to feel safe in the installation space and trust its communities:

I was intimidated the first time I spoke. I just said two or three words, at most. And then, the second time, I felt a little bit more at ease. Coming back several times helped me demystify the process. In this sense, I think that speaking at Mégaphone was more important for me than trying to get words to appear on the media façade. ([P10], focus group #3, 16 November 16,~20min)

This participant was indeed one who came to observe several times for the first three weeks before he conducted his first, timid intervention at the "Speakers' Corner" on the fourth week. I had noticed him early on, because he would stand with his bike for hours in the same spot as the other regular attendee seen in Figure 6.1, that is, just on the sideline of the small onsite master control-room. My field notes describe him as "regular observer #3" until the evening of Saturday, October 5, 2013, when, in the middle of the open mike session around 9:30 pm, he decided to use the microphone to talk about the Maple Spring. What was very particular about his first intervention was that he chose to do this while there were only three people in the agora space: the onsite technician, the Master of Ceremony and I. During his interview, he mentioned that he had felt safe around us because all three of us were always there and had a congenial presence ([P10], focus group #3, 16 November 2013,~1h09min15sec). In the weeks that

followed, he would take the microphone once to twice a week for brief interventions, but he did this when there were more people in the agora during open mike; he was one of the regular attendees who came to say goodbye on the last night.

The installation was also often used by youth as a hangout, while tourists, pedestrians, cyclists and others just waiting for public transport would either briefly stop or else remain in the space for a while to actively listen when the topic was of interest to them. Of course, one of the big differences between Mégaphone's live offline social media platform and online social media platforms is that the former confronts participants with strangers that they might otherwise not meet or friend over the Internet. Interviews with the participants suggest that this finding had great significance and implications. In particular, one interviewee described Mégaphone as a:

> …platform that challenged my ideas and spurred reflections…because it was not a closed bubble…anyone could participate in the debates and I wish more had. ([P9], focus group #3, 16 November 2013,~2min15sec)

As open forums used to exchange news, views and opinions, online social media platforms – especially the ones that include blogs – have often been compared to *echo chambers* (Wallsten, 2005, pp. 6-7). In other words, rather than promote creative and rational debate over current issues, online platforms may tend to publicize existing content and intensify its impact by endlessly repeating it with little significant change. Conversely, most of the interviewees said that being in a public space that exposed them to new people and ideas was what made the Mégaphone a different environment:

> It is a civic necessity that every city in the world should have because it fosters new debates [which] its digital features support by giving it a performative dimension with the façades filling up the space with our spoken words that appear gigantic. ([P8], focus group #3, 16 November 2014,~4min30sec)

Moreover, longitudinal interviews (onsite and *post hoc*) revealed that onsite participation could also stimulate online activity with content that had been produced *during* live Mégaphone interventions. It was in the production of such content that the monumental media façade played its most important role. Many people photographed the words on the media façades or their performance at the "Speakers' Corner" platform with their personal digital recording devices to keep them as a souvenir or to republish

them online. In fact, this relay between the onsite real time/space experience disconnected from the online world, and its second life in the form of a historical archive circulating on the virtual spaces of the Internet was a digital practice that was so routinely performed by participants that I believe it hints at a wealth of possibilities for offline digitally-enhanced sites of representation to mesh with the online environments in more ways and for more purposes than we have yet imagined as these findings suggest.

In the previous chapter, it was observed that people sometimes read textual content downloaded to their smart phone, or played audio content streamed live into the microphone to perform at the Mégaphone. One could say that they were *uploading content from an online source onto the digitally-augmented public space*. Conversely, during interventions, I also observed many ways in which people *uploaded content produced from the onsite installation space onto their onsite virtual spaces*.

For instance, on an open mike session at 8:30 pm on Saturday, September 14, 2013, a young man took the mike and said: "Good evening, my name is David. Now how about we put some good words on the big screen? What good words do we want to see broadcast throughout the city? We want to see 'peace', we want to see 'love', we want to see 'respect'…" and he continued with a long list of such "good words". To make sure they were displayed in big font on the monumental media façade, he realized that he had to repeat them over and over again, reciting them in a litaneutical manner. After a few minutes, his words appeared and everyone in the agora looked up and pointed at the words, some laughed, some applauded, others came up to the microphone and added more words in the same spirit. Most people photographed the façade with their portable devices to share it later on websites, blogs and social media, or by email.

Many tourists also used the installation to create digital postcards that they would send abroad in real time. That same evening of Saturday, September 14, 2013, later during open mike, around 9:00 pm, a young man took the mike and said, "I just want to send a message to my mom who is 5000 km away: I just want to tell you that I love you mom and that I miss you". He then repeated "I love you" and "I miss you" several times so if some of those words would appear on the monumental media façade. When they did, he photographed it and immediately emailed this image to his mom, announcing it to

everyone in the agora from the "Speakers' Corner" where he was still standing. Two weeks later on the evening of September 25, 2013 at 10:20 pm, another man also used the façade to post a message of support for his friend back home who was in hospital. He asked me: "How can I post a message on this giant 'noticeboard' for my friend Brian in England who is bedridden in the hospital? I want to send him a get-well-soon message by email". After I explained how the system worked, he repeated the words "Brian", "get", "well" and "soon" over and over until they appeared on the façade. He then photographed a digital image of it and emailed it to his friend abroad on the spot.

One could say that this allowed people to capture evidence of their *having-been-there* – which represents a second degree of the Barthean concept (Barthes, 1985, p. 33). Interviewees often brought up the fact that the added digital value of Mégaphone was that while its voice amplification system fulfilled people's need to be heard by others in physical space, the media façade provided a giant screen for them to be seen. When we think of screen interfaces, we generally think about how they can give us digital presence in an online virtual public space (Thompson, Hemment, Cooper, & Gere, 2013, pp. 36-37). But even without an online connection, Mégaphone's public display offered participant a real physical presence by publishing some of their words in the city:

> There are many reasons to speak at Mégaphone: artistic, political, social…but there are also selfish reason, like, I say words, they appear on the façade, I take a photo and I can say 'I was here'…this is the playful aspect of Mégaphone…but even those who didn't use the façade, for once, they had a space where they felt listened to…for some people, this satisfies a need to strengthen their ego; that too is important… ([P9], focus group #3, 16 November 2014,~28min)

An intriguing question raised by these field observations is whether the introduction of an interactive technology that is not connected to the Internet, but that digitally-augments interactive communication in urban space might have the power to catalyze new kinds of communities. If so, would it be fitting to call these "digital communities"? What criteria would be used to define these offline/onsite "digital communities"? How would they be significantly different from non-digital ones? What added value might this communication model bring to public space?

We all live in the virtual in a certain way now. I am sure most people use social media like FACEBOOK™ almost everyday. Mégaphone is like a FACEBOOK™ wall but with a stage. I would use the installation as a stage in the city to digitally record interventions and words on the façade and then post those images and videos online to connect the online digital world to the real world. Because I think we still need face-to-face interactions in a public setting. The challenge is to find a way to connect the new sense of community that online social media has allowed us to experience – this sense of belonging to a larger, more global community – to an actual place where people can interact in person. This would expand the social dimensions of these two distinct digital environments. ([P4], focus group #1, 6 November 2013,~1h20min30sec)

Further research on this form of secondary instrumentalization in-the-wild might not only provide some of the knowledge needed to construct a bridge between top-down design and bottom-up uses, it might also enable communities to use digitally-augmented public spaces in order to constitute new kinds of Third Places in urban settings, ones in which, as McQuire (2008) writes, people must perform public space to make it appear and to take part in a civic life that concerns all of the media city's diverse publics (pp. 130-158). Would new digital hybrid spaces emerge from enmeshing offline digitally-augmented social media sites with online ones? The next case study suggests so.

6.2.2.   A Commemorative Urban Media Façade[13]

At nine-thirty in the evening, Wednesday, October 2, 2013, three Montréal artists named Serge Lavoie, Rudi Ochietti and Didier Berry, stepped up to the Mégaphone's "Speakers' Corner" to conduct a joint public action. They had deliberately staged their intervention with an artistic edge, but its purpose was manifestly political. What brought them together that night were two distinct incidents of discriminatory misconduct by police officers that had almost cost them their lives in 2012 (Abel & Fournier, 2013). It is on this common ground that Ochietti, Lavoie and Berry came to meet and support one another in their quest to ensure that the local police force got its house in order. Like many others who have experienced police abuses of power in Montréal, the men have been actively involved in fighting against impunity in cases of police brutality by participating in online activism and using social networking sites to regularly organize fundraising events, vigils and street protests. Mégaphone, however, provided them with

a new means to engage in digital activism with technology that supported onsite embodied interaction: offline, without Internet.

Lavoie discovered Mégaphone in summer 2013. He came across its first advertising campaign, when he was working at the National Film Board of Canada, composing music for a documentary film (National Film Board of Canada, 2013b):

> I saw several advertising posters about the Mégaphone in the NFB building and decided to check out its official website. The project immediately caught my interest. I asked some of the NFB staff working on the project if I could use the Mégaphone "Speakers' Corner" to talk about what had happened to me and they responded with great enthusiasm. They encouraged me to come and speak during a session that specifically addressed the topic of police brutality. It was to be officially hosted by the local newspaper, *Le Devoir*, on October 30th. But I decided to plan my own intervention instead on October 2nd, 2013 because that date marked the one-year anniversary of my assault. In fact, I felt very strongly about doing it at 9:30 pm sharp because that was the exact time the whole ordeal happened (S. Lavoie, focus group #4, 20 January 2014,~1min).

Due to the fact that the Mégaphone schedule was maintained by NFB staff and that Lavoie decided to improvise his own intervention at the last minute, the event was never programmed into the official online schedule. As a result, it took place during an open mike session. In hindsight, Lavoie deplores this because it meant that their intervention "did not receive any publicity on the official Mégaphone website, in its agora or in any other official channel" (Ibid.). In the end, Lavoie, Ochietti and Berry chose to announce the event through their online community networks. Although the men decided to proceed independently, I duly noted that the affordances of the online website and of the public space installation did not provide means by which they could publicize their intervention without going through the official vetting process with NFB staff in advance.

In response to the publicity they made on their own social media networks, over twenty of their friends sat on the benches in the Mégaphone agora in support of their action, while the three men staged an intervention that transformed the setting into a nocturnal vigil and the imposing media façade into a commemorative monument as shown in Figure 6.2. During a public intervention that lasted over twenty minutes, the three activists shown in Figure 6.3 took turns reading a short text followed by a list of the

names of seventy young men who had died as a result of police brutality in the city of Montréal between 1987 and 2013.

Lavoie, Ochietti, and Berry obtained this list of names from a network of well-established local cop watch groups that had spent years compiling them through collaborative efforts. Member of these groups had conducted this research themselves by sitting in the coroner's office or police precincts leafing through reports one at a time, or else by searching newspaper archives online or in public libraries. It is noteworthy that these lists did not exist as a public body of knowledge *before these activists produced them*. How important is it for such lists to exist and to be made public? Does it only help advance these activists' cause or does it also serve the general public's interest? Lavoie, Ochietti and Berry's public intervention provides some insight on these questions and on the role that such archival politics can play with interactive digital public displays:

> We had access to this list of victims who died as a result of police brutality and I was thinking that it would be great to read the names of these victims and have them displayed on Mégaphone's large media façade. Furthermore, I knew the police headquarter was just a few blocks away and that the police officials on the upper floor would be able to see the names of the victims appearing on the façade from their window…you know, these young men should not have died and they did…and that's a big thing that no one ever talks about… (S. Lavoie, focus group #4, 20 January 2014,~3min)

As the speech recognition software processed their voice input with a 20-second delay, observers and passersby could see some of these names appear across Mégaphone's monumental media façade as seen in Figures 6.4. Given that the speech recognition system linked to that digital display can only transcribe the speaker's utterances at a 70% to 80% efficiency rate, some names were either misspelled or not published at all. In addition, when the system processed the words for display, it would separate them and place them randomly on the giant graphic interface which meant that the victim's surname might appear far away from the given name. The result was that the transcriptions were unreliable and visually unpredictable.

A comparative review of interview data revealed that each stakeholder community had radically different feelings about this flaw in the system. Producers perceived it as a technical failure (M. Charpin, interview, 9 January 2014,~8min).

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Designers welcomed it as an intuitive way to moderate content by breaking speech up into word-units to semantically disassociate them from one another, thus reducing the chance of inflammatory language from appearing (A. Lupien, interview, 31 July 2014,~16min). And two of the three activists saw this as a fortuitous outcome that was part of the happenstance of performance art:

> I noticed this problem right away, but I didn't mind it because it made me feel that the mere act of reading these names had a ceremonial quality to it that was, in and of itself, very powerful…these names had weight because they evoked real lives…to imagine the reality of what these men experienced before their death is absolutely horrifying and it makes no sense in a society like ours. (S. Lavoie, focus group #4, 20 January 2014,~8min30sec)

> I didn't mind the informal quality of the graphics and the fact that the speech recognition system was not particularly accurate because I saw our intervention as a spiritual and artistic gesture. We showed up after dark that evening and there we were 'splashing' these words and these names on a huge media façade in the middle of the city. I felt that the abstract character of the transcription was thought provoking…it even made me wonder, what do these words and names mean? Because we were uttering these names to bring them back into memory but they were being misinterpreted or dispersed by the Mégaphone just as they had been mistreated, dismissed and forgotten by society and the news…so it was as if we were trying to remember these forgotten souls. (D. Berry, interview, 20 January 2014,~9min)

These divergent perspectives suggest three things. First, that one stakeholder's design problem is another's affordance. Second, because issues around the surveillance, moderation and control of content is contingent on each stakeholder's agenda, their problematization may be far more nuanced than is often assumed in discussions that weigh in on behalf of end users without consulting them. Third, it is often taken for granted that free speech has the clarity of political oratory, but as Paquette had anticipated, with new media, it can take many forms of expression.

Further, contrary to most contemporary media technologies, Mégaphone allowed end users to engage in playful self-representation that supported *embodied publicness*, while adding a new dimension to oratory as its monumental display supported live and archival self-publication of graphic text in public space. It is noteworthy that the activists appropriated Mégaphone *because of these social affordances*. During their interview,

they stated quite clearly that they did not want to keep their identity anonymous because their intervention was about confronting their fears and going public, in spite of the risks that this represented. The platform appealed to them because it allowed them to communicate in public space without being silenced or moderated, the way content contributors can be in social media (S. Lavoie, focus group #4, 20 January 2014,~32min). This importance of this issue may be better understood through this interview excerpt:

> [Months after the incident,] a man who recognized me on the street said to me: 'oh yes, I have heard about your story with the policewoman trying to strangle you, but you know I can't believe it was as bad as you say because after all, you are still alive, so how bad could it have been?' So there is this strange perspective out there that it is just business as usual for people to be victim of police brutality and to die from it. My take on it is that I want my community, and this society to be as well informed as possible about these issues and how things really happened because people need to know that there are mistakes made in the police force and judicial system. It's important because otherwise what happens is that people hear about how someone has been arrested and they automatically assume that this arrest is a legitimate one because they assume that the system never makes mistakes. And this is a very, very dangerous assumption which, without a system of checks and balances, will not only lead to abuses but could legitimate them by creating a blind spot in the public eye. (S. Lavoie, focus group #4, 20 January 2014, ~1h09min45sec)

Lavoie's comment suggests that the activists were well aware that a technological platform such as the Mégaphone could be appropriated as a means to make public the list of victims by conducting a eulogy that would transform the plaza into a memorial space. Yet, when they had planned their intervention, they did not know that the monumental media façade had an archival sleep mode on top of its performative live mode (S. Lavoie, focus group #4, 20 January 2014,~29min). It was only on location during the actual ceremony that they realized that the Mégaphone had temporal affordances that could transform the architectural-scale media façade into a commemorative monument in two substantially different ways. First, as shown, the names of the deceased would *temporarily* appear in real time onto the monumental media façade until they were wiped clean a few minutes after the last speaker hung up the microphone. Second, and unbeknownst to them, these names would become *permanently* inscribed into the system's archival database, which had been designed to

keep a record of all of the words transcribed by the speech recognition software throughout the full ten weeks of the Mégaphone deployment.

Place-Making: The Physical and the Symbolic in Implicit/Explicit Interactions

In live mode, the use of the façade explicitly laid claim to both a physical space (the material appropriation of a giant screen in a public plaza) and a symbolic space (evoked by the meaning of the words represented onto this screen). In sleep mode, however, the outcome was uncertain: whether the names appeared or not was determined by how accurately the main speech recognition software processed them in conjunction with how often they were repeated. Every time an uttered name was correctly transcribed, it would be effectively recorded in the database and would thus have a chance of being published. Figure 6.5 shows the display in live mode when the word "oui" was repeated over and over again. While in live mode, recurrence could make a transcribed word appear in bigger font size or several times on the façade, in sleep mode, a word could only appear once in a font size that reflected how often it was registered in the database.

Thus, if a name was not repeated during the ten-week deployment, it might never again appear on the façade. It would, nevertheless, remain forever inscribed in the database. While the use of the façade in live mode afforded explicit interaction, that is, a form of expression that manifests *presence* and leaves little implied, the database-driven sleep mode favored implicit interaction, a form of expression that suggests *absence* and incites one to imagine that other names may exist even though they are not displayed. In sleep mode, the database itself becomes a symbolic space, a digital mausoleum in which the deceased can invisibly rest in peace. But whenever some of their names appear on the sleeping skin of the façade, as Manovich (2001) argued, new media design has the power to reverse the traditional relationship between syntagm as explicit and paradigm as implicit (pp. 230-231). In sleep mode, Megaphone's monumental media façade foregrounds paradigm (the database) in the production of meaning, while syntagm (the spoken word) is merely evoked.

Made possible by the database, this aspect of the dual skins of the façade – the physical vs. the symbolic, and the explicit vs. the implicit – gave the activists more powerful tools than they had expected to get their message across. For instance, once the three men understood that in sleep mode, the system's archival database was programmed to display the "most frequently spoken" words transcribed by the speech recognition software throughout the fall of 2013, they told other activists, who planned to come later that month to conduct their own ceremony in order to keep the victims' names in high priority in the system's database until the very last day of the deployment.

For instance, as one participant told us, the Collective Opposed to Police Brutality (COPB) also made sophisticated plans to stage their own artistic intervention:

> Three of us were supposed to present ourselves at the Mégaphone on October 31, 2013 and because this was Halloween night, we had thought we might make it a costumed masquerade performance event during which we would also read our texts…unfortunately, we were not able to do the intervention because there were torrential rains and the weather was quite cold that evening. This forced us to cancel at the last minute. ([P22], interview, 16 January 2014,~32min15sec).

As previously mentioned, the list of names that Lavoie, Ochietti and Berry read at the Mégaphone had been collaboratively produced by several groups of activists from a research initiative originally instigated by the COPB, who publishes its own version of the list on their webpage titled "Remember!" seen in Figure 6.6. Preceding the long list of names on this webpage is this copy written in preparation for the aborted intervention:

> Welcome to Kanien'kehá:ka (Mohawk) territory. Today, we commemorate the dead. This mégaphone belongs to the dead, to those who have disappeared too early and too tragically. My voice is their voices, the voice of those who have been unjustly murdered by the police, those unjustly murdered by the SPVM. I am the voice of…[*sic*] (COPB, 2013)

Although they do not self-identify as Native, the COPB activists wanted to make sure that those present at their intervention knew that Mégaphone was being deployed on First Nations territory. While the colonial appropriation of Aboriginal lands in North America stands as a stark example of the power that can be gained through the occupation of physical and symbolic spaces, the public appropriation of a digital technology such as Mégaphone can arguably counter this process by providing

opportunities to physically and symbolically reinvest digitally-enhanced public sites with new meaning. In this sense, the first line of the COPB manifesto that was to be read on Halloween night underscores how the symbolic and the implicit character of space can be used to reclaim the power that has been lost if it can come to overpower hegemonic physical and explicit dimensions. After all, power differentials can be negotiated in the act of communication. Furthermore, the COPB intended to deploy their place-making tactics by extending this occupation to online environments. As the interactant explains:

> The way we had organized our intervention was that we had planned for some of our friends to come and film us with a video camera so that we could then upload those videos on our COPB website…we wanted to use the Mégaphone, not only to transmit our ideas but also to allow to publicize the COPB: to show that we exist. Our collective is not well known and still very much in the shadows. We do want people to know we exist so that they know that there are activists such as us out there that are engaged in defending the rights of all citizens when it comes to cases of injustices that involve the police…Mégaphone seemed to us like a tool that could give us the possibility of doing this in a format that seemed rather user-friendly. ([P22], interview, 16 January 2014,~34min30sec)

Although unwelcoming weather forced the COPB activists to cancel their Halloween night intervention, there were a few open mike sessions left before the end of the deployment. And indeed, Monday, November 4, 2013 – the last evening that Mégaphone was being deployed – in *impromptu* manner, one of the members of COPB showed up and read a eulogizing text he had himself written, which seemed like an extended and modified version of the collective's manifesto, except that it included the same full list of names of those who had died as a result of police brutality as the list read by Lavoie, Ochietti and Berry.

Figure 6.7 shows one of the citizen journalists who operates the alternative online media collective, 99%MEDIA; that evening, he filmed the intervention, edited the footage adding additional visual content and effects, and posted it four months later on YouTube™ under the name *89 silences* (Lussier, 2014). In the context of this doctoral research, the *emerging digital hybrid spaces* framework was developed as a tool to trace meaningful interventions across multiple physical, virtual and imagined sites in order to explain how virtual spaces of representation and real world places come to be

interconnected through digital practices (Fortin, Hennessy, & Sweeney, 2014a). This analytical strategy proved to be a valuable tool in the context of multi-sited fieldwork because filming interventions and reposting them online was a practice that those who appropriated Mégaphone engaged in on a regular basis as these findings show.

While Mégaphone's design affordances make these new forms of imbrication between "the digital offline" and "the digital online" possible in the context of public interaction, they also serve to illustrate how the notion of *territoriality* can take unexpected forms when end users appropriate a system in public space. For this reason, theories on territoriality might provide a useful frame to reflect on the possibilities that implicit and explicit use of space can open up when interactive technology is deployed in public space. In fact, such an approach has already been used to study interaction with shared display interfaces:

> Human territoriality researchers generally agree that territories serve to help people mediate their social interaction through laying claim to a space…or through association of a space to a person due to repeated use... (Scott, Carpendale, & Inkpen, 2004, p. 300)

However, from a design perspective, it may be more appropriate to apply the concept of *place-making* to locative media, as is often done by scholars and practitioners linked to the *Urban Screen* movement. While territoriality places the emphasis on who owns or shares the space, place-making speaks to how people can create its meaning through storytelling. Place-making is a narrative speech act which remembers and imagines past events to create symbolic and physical associations to a place. Yet, it is not only a way of remembering the past, it is also a way of constructing social traditions and identities and "history itself, of inventing it, of fashioning novel versions of 'what happened here'…a venerable means of doing human history" (Basso, 1996, pp. 6-7).

Place-making narratives speak to specific emplacements evoking that *this* event happened *her*e. While the activists used the Mégaphone to tell the story of men who were killed by police in different places in Montréal, they gave these victims an audible and visible presence in *this* space by calling out their names, suggesting digital technology can be used to appropriate sites for public representation. Accordingly, technology design played a crucial role in supporting place-making. When asked how

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Mégaphone could have better supported their cause, the activists explained that their intervention would likely have had a more substantive reach if the names had instead been video projected on the police headquarters building two blocks away.

> What we really wanted was for the names of the victims to be projected onto the façade of the SPVM police headquarters because the meaning and impact of our intervention would have been even more powerful if the Mégaphone had allowed us to target *that* building [emphasis added]. (S. Lavoie, focus group #4, 20 January 2014,~4min)

It is noteworthy that Lavoie's comment suggests a design implication that several other participant interviewees expressed: the desire to have access to an apparatus such as Mégaphone that would be mobile, portable, or easily dismantled and reassembled. This could take the form of a situated "Speakers' Corner" platform with a mobile video projection unit, a situated media façade with a mobile "Speakers' Corner" platform, or else both of these components as mobile and dismountable.

And indeed, five months after the interview with Lavoie and Berry, the *Illuminator Art Collective* used the façade of that headquarters to guerilla video project one silhouette image of someone carrying a sign that read "police everywhere, justice nowhere" and another of a menacing cop captioned "I just obey orders" (McSorley, 2014, para. 1). Like the Mégaphone intervention, the *Illuminator*'s tactical event, however, went beyond the ephemeral live projections. By visually documenting their interventions and circulating them on social media, the *Illuminator* also created a digital archive, but in online environments. While Mégaphone's sleep mode provides an onsite and offline digital archive that extends the life cycle of live interventions, the posting of audio-visual documentation of the live interventions can reach other audiences online through a different kind of archiving process (paras. 2, 19).

To summarize, this case study showed how Mégaphone was transformed into a commemorative urban media façade over several weeks by an intervention initiated by Lavoie, Ochietti and Berry and taken up by other activists. Both the practices of place-making *and* of emerging digital hybrid spaces took up several dimensions in this series of interventions. We saw how place-making was instantiated through three different narratives: (1) creating an ephemeral mausoleum by virtue of a eulogy; (2) reclaiming

land by the public recounting of Native peoples' historical land claim of the Promenade des artistes plaza; and (3) enacting a provocative political action by guerilla video projecting digital graffiti on the façade of the SPVM police headquarters. We also saw how documentations of the live interventions produced emerging digital hybrid spaces, either: (1) being circulated online for others to remember; (2) or else, turning Mégaphone's monumental media façade into a giant palimpsest in sleep mode.

Here, the database-driven archival sleep mode became the occasion for small cells of activists – in effect, a network – to engage in archival politics in public space. Using the temporal modalities of the façade, they transformed Mégaphone into a public memorial space that honored the names of the victims explicitly and implicitly, physically and symbolically, over many weeks, forever inscribing the names in the database. As one activist remarked, once the name of a deceased appeared in sleep mode, it literally became a *published record*, while other names inscribed in the database that were never displayed on the monumental façade, were preserved as a *public record*. How access to this public archive is negotiated is not only a matter of power differentials, it is also one of design. This highlights the key role that design plays in the politics of augmented public space *and* of its digital archiving. The next case study brings to bear the significance of *producing digital archives* in relation to news reporting.

6.2.3. A News Production Platform for the Fifth Estate[14]

While the list of victims in the previous case study underscores the role of self-publication, this next example suggests that an interactive public display system that can combine digital practices of self-publication with those of self-representation and self-archiving might support the emergence and development of a *Fifth Estate*. Building on the idea that the press constitutes the Fourth Estate as an important democratic institution which complements the legislative, executive and judicial branches of government, Dutton (2009) argues that, the twenty-first century has seen a Fifth Estate emerge as a result of online digital media practices (pp. 1-2). Until now, Dutton's concept of the Fifth Estate was mostly understood as an online phenomenon. Could interactive technologies such as Mégaphone – onsite and offline – extend it to other environments?

The turn-of-the-century saw a radical paradigm shift in Internet usage described in the literature as the evolution of the World Wide Web from 1.0 to 2.0 (DiNucci, 1999; O'Reilly, 2007). Indeed, the past two decades has seen new media platforms provide people around the world with new ways to, in the words of CBC journalist Mark Kelley, "collectively make things right". From the rise of citizen journalism to the mobilizations made possible through Internet, it has been widely claimed that new media has the power to revitalize free speech, the public sphere, political activism and social participation. Until recently, conceptual frameworks were applied to online media platforms and social networking services (SNS) such as FACEBOOK™, TWITTER™, YOUTUBE™, microblogs and discussion forums, the tools most associated with this claim. But after over a decade of theorizing user interaction largely in terms of the different forms that technology-mediated social participation has taken online, researchers have had to revise these conceptual frameworks to account for the new pervasive digital platforms – whether mobile or locative – increasingly designed to support other forms of interactions in public settings, such as digitally-augmented live urban spaces. What would happen if architectural-scale interactive digital technologies were used to facilitate new forms of Fifth Estate public interaction in real urban space?

Several distinctions can be made between the Fourth and the Fifth Estate. First, while the former includes the institutionalized networks of the written press, radio, television and other mass media, the latter is more loosely made up of "networked individuals…[which]…move across, undermine and go beyond the boundaries of existing institutions, thereby opening new ways of increasing the accountability of politicians, press, experts and other loci of power and influence" (Dutton, 2009, p. 2). Second, while the former consists in well-entrenched structures that are centralized and have relatively well-defined hierarchies, the latter has dynamic structures that are decentralized and more temporally and spatially in flux. Third, while the former operates almost exclusively within the set boundaries of social institutions and its hegemonic norms and values, the latter extends its action beyond these boundaries, thus opening up a space for contesting these norms and values (p. 3). Fourth, while the former are focused toward the exercise of greater order and control in the name of a universal common good, the latter pushes for open-endedness and freedom in the self-interest of particular communities. And fifth, while the former relies on institutions to define and

deliver the common good top-down style, the latter relies on grassroots groups formed by networks of individuals to set the agenda and take action from the bottom-up.

The two main distinctive features in this series of comparisons is the opposition between institutionalized practices and non-institutionalized ones, and accordingly, the opposition *between top-down and bottom-up approaches*. For this reason, it could be said that Dutton's model is not about digital media practices *per say* – since both the Fourth and the Fifth Estates engage in this – but rather about whether such practices offer the possibility of creating an undertow that pushes back on institutions when they have come to protect their own interests over the public's at all cost. Many would argue that because a robust press is one of the key factors for democracy to thrive, it is paramount to have an alternative press that provides other nuanced perspectives, and inasmuch as it largely relies on digital tools, it is the main component of the Fifth Estate.

According to Dutton (2009), the networks of the Fifth Estate have two distinctive features which characterize the interplay between its networks of individuals and the other four estates' institutional networks: first, it relies on digital technologies to afford the "enhancement of communication power…within and beyond various institutional arenas" (p. 3); and second, its action works towards the grassroots, bottom-up "creation of networks of individuals which have a public, social benefit" and are often described as "communities" (p. 3). Because this definition closely corresponds to this empirical study's field observations, it became quite clear during the deployment that Mégaphone might be construed as a technology constitutive of the Fifth Estate. However, just as the Internet can be said to help shape the digital practices of networks of all five estates, whether they are institutionalized or not, so too can Mégaphone be used by all five estates to give or receive information, occupy civic space, reach new publics and strategically affect outcomes. Indeed, the following intervention shows how the Fourth and the Fifth Estates can be mutually constitutive of one another as a news channel.

Staging and Producing First-Person Digital Recordings in Public Space

As discussed in the previous chapter, during the three-month deployment of Mégaphone, *Le Devoir*, which, under Dutton's (2009) definition would fall under the Fourth Estate – had reserved one-hour time slots on five consecutive Wednesdays

evenings to present their live editorials on timely civic issues. The associate news editor of this local independent daily newspaper explains their rationale:

> These interventions were organized as part of our mandate which requires us to be actively present not only in the public sphere, but also in the city as a social space. Of necessity, we are often involved in events such as conferences and debates. We saw the Mégaphone as a new kind of opportunity to support public speaking and public debate in real space rather than just online as public interaction increasingly takes place now. (J.-F. Nadeau, interview, 15 January 2014,~0min41sec)

This more "institutional" use of Mégaphone by a mainstream press newspaper may seem inconsistent with the conceptual intention behind the installation since it was primarily designed to be an interactive digital "Speaker's Corner", a public platform in the city where anyone could freely express their views and listen to their fellow citizens. But Nadeau and his editorial team were well aware that Mégaphone had been produced as a sign of good faith in the aftermath of the Maple Spring, and because *Le Devoir* had been one of the only news source that had abundantly published articles raising hard questions on the State's political, judicial and law enforcement interventions during the student uprisings, they felt a responsibility to show how it could be used for public speaking in the context of presenting news and editorial perspectives:

> Public speaking in Québec has a long-standing, steadfast history but this culture has been lost today: in the nineteenth century, there were public assemblies, deliberative assemblies, working-class assemblies, which included republican factions too. This culture was stifled probably because it does not serve the interest of those who set the agenda of public speaking. Having people stand on street corners publicly discussing all kinds of subjects must have been perceived as a threat to the common good by those who claim to defend and uphold social order. (J.-F. Nadeau, interview, 15 January 2014,~10min15sec)

Nadeau being a Québec history scholar, some of his interview data naturally echoed many of Paquette's, the conceptual mind behind Mégaphone. But Paquette had also noted that the way the press covered these popular assemblies was by simply reporting on what was said and what had happened. The first factor of communication – aka the primary news source – was therefore the physical assemblies themselves and what took place there. The newspaper was merely a channel that attempted to relay a first-hand account of this (É. Paquette, interview, 26 August 2013,~26min).

Testing the boundaries of just how much the Mégaphone was really meant to promote free speech, *Le Devoir* decided to try out a different formula for their last session, which was dedicated to the topic of public order policing during street protests in Montréal. On the evening of October 30, 2013, instead of having their own journalists editorialize on this subject, the managing editor of the newspaper invited citizens that had been unfairly arrested during the Maple Spring protests to give a detailed personal accounts at the Mégaphone of how they had been charged and treated by the judicial system, and later profiled and discriminated against during demonstrations. The Maple Spring mascot and social activist famously known as Anarchopanda had been tenaciously engaged in denouncing and contesting the abuses of power and prosecutorial misconduct that took place during student protests since 2012 (CTVnews, 2013, para. 2). As one of the leading figures in this cause, he was personally asked by *Le Devoir*'s Marie-Andrée Chouinard to help identify and recruit speakers who would tell stories that had not been heard in any mainstream media channel and were compelling enough to bring injustices to light.

Anarchopanda decided to contact Cécile Riel and David Sanschagrin because he believed theirs were the most noteworthy examples of the arbitrary, unwarranted and unlawful arrests resulting from police actions perpetrated upon citizens during Maple Spring protests; their stories left no one indifferent (Anarchopanda, interview, 9 January 2014,~2min). Their live, authentic first-hand testimonies at Mégaphone were intended to make public the glaring injustices perpetrated upon ordinary citizens during the Maple Spring, as a counterpoint to the fact that their stories had either been blatantly overlooked or else grossly misframed by the mainstream press (Anarchopanda, interview, 9 January 2014,~20min30sec). Given that there were only about fifty people present in the agora during Riel and Sanschagrin's respective interventions; one can wonder if these efforts could help any of the participants, or parties, attain the desired goal. How much impact do first-person news accounts have on such a small audience?

Yet, impact there was. Interviewees noted that it was not the interventions themselves that legitimized their stories; *it was the way the coverage of the event was later channeled in different online media*. This was made possible by two primary news sources: first, by the citizen journalist from the 99%MEDIA who – as he had done with the

COPB intervention described in the previous case study – filmed the interventions, streaming them live and archiving them online on his YOUTUBE™ channel (Lussier, 2013); and second, by *Le Devoir* who published a detailed 1000-word article on the interventions the next day – online and on the broadsheet's cover page (Rettino-Parazelli, 2013). These were later reposted by third parties. And indeed, the live-streaming of news over the Web and the online posting/reposting of existing news media items are two of the most common digital practices in Fifth Estate citizen journalism.

Lussier started out as a citizen journalist cameraman covering the Maple Spring protests by live-streaming his video captures on the 99%MEDIA website. One of the advantages that he enjoys is that he has access to sources and publics that are completely closed off to members of the mainstream press. Lussier has been actively engaged in grassroots community initiatives for many years now. Many people trust him and know that he will not distort the facts and stories that they send him, the way they feel the mainstream press would. At the time of his interview, he had over 1400 followers on TWITTER™ and 1200 followers on FACEBOOK™. This may not seem like a large audience, but his viewership can at times rise since followers who monitor his live-stream news feed will alert their friends through social media when Lussier is capturing newsworthy footage. This implies that there can be "down time" while he is filming with about 40 people half-watching, then suddenly the viewership can exponentially go up.

According to Lussier, he has had about 1800 viewers at the most at any given time. He knows this because while he is broadcasting live, he uses an application that allows him to see the number of viewers who have his channel open. This application also allows him to ask viewers a yes/no question while he is filming. Lussier uses it to ask his viewers what coverage they want him to prioritize when there are several newsworthy events or location:

> For instance, if there are two streets protests happening at the same time.., I can ask those who are following me if I should continue filming the protest against Monsanto or should I go and cover the one against Stephen Harper's policies? (S. Lussier, interview, 14 January 2013,~33min06sec)

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He also chats live with his viewers. This can be useful in assessing or confirming important facts:

> One of the affordances I like the most about new media is that it allows us to interact live…someone watching my live-stream can ask me while I am filming, 'How many people are protesting?'… So, people don't have to wait until there is a press conference or press briefing held during a news event.., they can get the feedback from me as it is happening. (S. Lussier, interview, 14 January 2013,~35min40sec)

Because he is in the middle of the event, Lussier can immediately reply. This may seem trivial, but according to many Maple Spring protesters that I interviewed, one of the most common fallacies that was newscast by the mainstream press during the protests was how big the demonstrations were. Interviewees recall being part of demonstrations that had hundreds of thousands of protesters, and later reading or hearing in the news reports that there were only a few thousand, sometimes barely a few hundred. This infuriated many supporters of the social movement. But perhaps more importantly, it illustrates the importance of self-documentation in citizen journalism within the Fifth Estate. If the mainstream media is misrepresenting how many people support a street protest, then how else can the truth be revealed but by creating evidence?

The way Lussier used online environments to live stream and archive Riel and Sanschagrin's testimonies at the Mégaphone opened up new possibilities for "doing news Fifth Estate style" on a public platform that can be appropriated as a *stage*. For instance, while he was live-streaming, Lussier could have received questions for Riel and Sanschagrin from his viewers. By serving as the intermediary who could pose these questions in person at the end of the interventions, and by documenting the responses, Lussier would have allowed his viewers *to interact with the source of news itself*. Lussier also archived this video on YOUTUBE™ as shown in Figure 6.8. Further, other people also blogged about the event and posted their photos online as shown in Figure 6.9. But it was *Le Devoir*'s coverage of the intervention that really harvested the full potential of Mégaphone as a first-person news reporting platform.

The online version of the article published by *Le Devoir* on October 31, 2013 was reposted as a link by several community networks and activists on their TWITTER™, FACEBOOK™, blogs, websites or news feeds. In Québec, *Le Devoir* is considered a

highly respectable French-language newspaper and it is one of the only Canadian dailies that have survived the tsunami of media convergence. It offers well-informed critical editorials as well as independent, balanced coverage of current news events. It also regularly publishes several contributions by university professors and intellectuals. For this reason, when an article is published in this newspaper, few readers question its veracity and authority. This is critical because one of the main problems faced by citizen journalists in the Fifth Estate is that of credibility (Dutton, 2009, p. 9). Further, well-informed citizens tend to be suspicious of a news item published in Fifth Estate channels when it offers a version that outright contradicts that of the mainstream press.

A case in point: based on his followers' "likes" and "comments", Anarchopanda remarked that the unofficial comments he had posted on TWITTER™ and FACEBOOK™ about Cécile Riel and David Sanschagrin's story garnered limited attention and comments. However, his republishing of *Le Devoir*'s article on the same social media sites created a greater buzz around their testimonials and gave them a new legitimacy, which he believes was a result of *Le Devoir*'s journalistic authority:

> You know, people innocently tend to believe the version published in 'official' news sources…maybe it is because when people hear these false stories reported on mass media news channels, they don't question whether it's true or not, and therefore they don't seek to find out what really happened….when *Le Devoir* approached me about organizing an evening on the subject of police presence on the streets, my first idea was to have victims of obvious prosecutorial misconduct publicly testify…my main goal was to bring their stories out in the open because I knew that if people heard their versions first-hand, they would believe them…that's why we had been looking for a media space to out these stories. (Anarchopanda, interview, 9 January 2014,~5min)

Asked if Mégaphone helped them achieved this, he adds:

> One of the problems I see with Mégaphone is that it tends to attract people who are already well informed or actively engaged…in the end, our interventions that night were worth the effort mainly because of the media coverage it received the next day in the article run by *Le Devoir*. (Anarchopanda, interview, 9 January 2014,~6min30sec)

Here, we see that this form of offline citizen journalism has its greatest impact when it is documented and republished in paper-based or online newspapers, or else

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broadcast in mass media channels to be later posted online as "official" news. In this context, Mégaphone offers a publicly visible place where the telling of a news event could be staged live and later garner attention from a real critical mass online.

> Mégaphone is not a space for formal presentations or conferences. It's a space that lends itself to telling stories, giving personal accounts and sharing experiences because its theatricality spurs the curiosity of passersby. (Anarchopanda, interview, 9 January 2014,~1h15min30sec)

According to HCI researchers, the power of interactive screens in public space "stems from their ability to frame situations" and to "transform urban areas into the most impressive stages the world has yet seen" (Kuikkaniemi et al., 2011, p. 40). Field observations supported this: they showed that end users often used Mégaphone as a live stage and as a live studio to record interventions.

One of the experts interviewed about the deployment of Mégaphone suggested that designers could support this by adding to the installation a few cameras that would provide an accessible archive of the interventions online (M. Charpin, interview, 9 January 2014,~37min30sec). Most of the participants we interviewed also felt that an online archive would be desirable and useful. However, many expressed serious concerns about who would film and control this archival audio-visual content. Some thought that the camera could be a feature of the installation itself, while others preferred the idea of participants using their own digital devices to record the interventions and post them online.

The overall analysis in this doctoral dissertation strongly supports the latter. Most people had a smart phone or camera with which they documented the speakers' interventions, the façade and the installation space, and we found numerous cases of interventions being made public on websites, online blogs, FACEBOOK™ walls and other social media (TWITTER™, YOUTUBE™, etc.). Murdock and Golding (2005) have argued that media ownership is found to structure the nature of news-making and create a bias in what perspectives dominate (p. 83). In particular, they posit that it is those who own the means of production and distribution of cultural content who determine what views and stories prevail and are perceived as legitimate (pp. 78-79). For these reasons, it would seem advisable that citizens retain as much control as possible in this process to

allow for first-person news reporting to be digitally documented and archived by non-institutional sources. In no way does this hinder the work of the institutionalized press. On the contrary, in best practices, each could ostensibly complement the other.

For instance, the original post of the article in *Le Devoir* included a photo of Riel and Sanschagrin standing in front of Anarchopanda and the Mégaphone installation (Tremblay, 2013). This image gives the two speakers a human face and shows them as mature-aged citizens that look more like next of kins than political agitators. Indeed, Riel is 56 years-old and goes under the name @FrogsAreLovely on TWITTER™, while Sanschagrin was, at the time, a Master's student in political science and regular columnist for *Union Libre*, the UQAM student newspaper. A mere look at them on *Le Devoir*'s photograph makes one wonder how they can ever be charged with anything but jaywalking. With this photo, *Le Devoir*'s article did not only bring legitimacy to their stories, it humanized both victims and reminded readers that this could happen to them. But it is its reposting on social media by citizen journalists that gave it further traction to receive attention from a wider critical mass of readers. And if this article were to be semantically linked to other non-institutionalized sources of news images, such as the other photos taken by citizen journalists or members of the audience posting them online, this could have a synergetic effect on the coverage, whereby the Fourth and the Fifth Estate *really do become mutually constitutive of one another*. As seen in Figure 6.10, Anarchopanda used a cropped version of *Le Devoir*'s photo as his FACEBOOK™ profile thumbnail photo in the weeks that followed this intervention. The fact that he chose *this* photo instead of any of the photos that I saw his friends take that night supports this idea that Fifth Estate alternative news organs need and value the Fourth Estate too.

Le Devoir's offices are located a street corner away from Mégaphone at a distance of about fifty meters. After the deployment, I asked Nadeau who at the time was associate news editor if he thought this digitally-augmented "Speakers' Corner" could offer a new means to produce news in public space. He expressed skepticism:

> The problem I see is that it has been sold as a space for citizens to engage in public speaking. But I think this is a mystification because what we saw at Mégaphone was what we see everywhere else: an illusion that there is a public space in which everyone's voice can be heard when in

fact it's always the same people who speak publicly on behalf of others. Furthermore, they all belong to the same social class, come from the same background, have the same education, and share the same values…in fact, they all know each other and greet each other with a kiss…and I am the first to admit that I am part of this…because those who work in newsrooms here or around the world, also studied the same subjects, are of the same generation, have the same profile, hang out in the same places, like the same music, and what's more, breed amongst themselves and create dynasties…we see this with many members of the press that come from the same family, but generations apart…so in fact, what is really going is that a whole class has taken it upon themselves to stage its own self-representation in the public realm, and this includes the news. (J.-F. Nadeau, interview, 15 January 2014,~14min25sec)

Nadeau's comment echoes the findings of prior empirical research, which traces the contour of this phenomenon from a political economic perspective and argues that now that the press's labor force has been bought into the middle-class, it is more biased in defending its values since they now also represent its own interests (Accardo, 2007). More broadly, McKercher and Mosco (2007) have published several studies that show the increasing job precariousness of knowledge workers and expose the myth of the Information Society, which, according to this perspective, works towards thwarting knowledge, creativity and critical thinking, especially in the media industries.

Nadeau explained that not all of *Le Devoir*'s journalists were comfortable with presenting at the Mégaphone because public speaking involved "playing the game of self-representation in front of a crowd" and while some journalists enjoy this, others prefer the less glamorous, more private space of the broadsheet: "The framing of news in itself is a sort of mise-en-scène, so the public stage of the Mégaphone added yet another level of mise-en-scène" (J.-F. Nadeau, interview, 15 January 2014,~6min15sec). Field observations corroborate Nadeau's analysis.

However, with regards to Mégaphone's potential to uphold a robust citizen press in the Fifth Estate, field data does not support Nadeau's reservations. Perhaps this was because he was not present every evening of the deployment; he attended only a few of *Le Devoir*'s programmed presentations and some interventions involving famous local figures that attracted large crowds. Field observation confirm that indeed those celebrity speakers tended to attract over 150 people and enjoyed generous coverage of their intervention by different mainstream media news outlets, while speakers who were

ordinary citizens from all walks of life generally had an audience of under 50 people and no media coverage by the mainstream press. In spite of this discrepancy in terms of audience size, interpretation of this field data in conjunction with interview data suggests that it is precisely because the installation affords self-representation in both physical and discursive space that it can provide citizens with a means to produce news: live in real public space and streamed online, then asynchronously circulating in virtual space as an archival media documenting the staging of first-person news reporting. This highlights the importance of a platform such as Mégaphone for the Fifth Estate: it can support the *live production of news.*

There has been a great deal written on how the Internet and digital devices have facilitated online citizen journalism in the past decade. But this case study has shown that digital technology could actually support new forms of Fifth Estate digital news-making. In conjunction with online environments, would this present a new epistemology for news-making, one that is constructionist at its core? We have seen how self-publication, self-representation and self-archiving can support this. The next case study probes further into the relationship between the offline and the online by looking at how Mégaphone can also support self-promotion and crowdfunding in new economic models.

6.2.4.   Crowdfunding-like-Busking in the City

The three previous case studies showed how public interactions performed on a digitally-augmented platform such as Mégaphone can support place-making and the creation of digital footprints in onsite/offline *and* online database-driven systems – that is, how a physical place can come to be interwoven with a number of virtual spaces through digital practices by blending emerging digital hybrid spaces. This last case study looks at how Mégaphone can help bootstrap online presence to further democratize the exchange of financial capital and thus ostensibly help level the playing field.

More than a decade ago, Chris Anderson (2004), the editor-in-chief of *Wired* magazine, authored an article titled "*The Long Tail*" in which he claimed that, with the advent of online media distribution platforms, the hit-driven mass-market consuming of cultural goods was giving way to an entirely new economic model (para. 6), one that

could end "the tyranny of the hit" by ending distribution scarcity (paras. 6; 66). With their negligible storage and bandwidth costs, online platforms such as Amazon, iTunes and Netflix, he claimed, have allowed the aggregate sale of nonhit books, music and films to become as, if not more, profitable than the mainstream fare (paras. 30; 49). Based on his analysis of the economic potential of these new long tail niche markets, Anderson boldly predicted that the twenty-first century's "emerging digital entertainment economy was going to be radically different from [this past century's] mass market" business model (para. 6).

This transformation of the cultural industries has not exactly reaped its promises, at least not in the pocketbooks of the creative individuals who are at the heart of the production process (Hesmondhalgh, 2013, p. 348). Of course, Internet-based retailers have astutely found ways to benefit from these new economic models, but has there really been a substantial trickle-down profit distribution for the artists themselves? The agency that artists have been able to exercise to participate in the making of these new economic models seems to depend on how much clout a given artist has.

Over the past decades, the music industry has seen many successful musicians publicly take on the behemoths of online music retailing to defend their share of the profit; the hope is that lesser-heard music artists will benefit from the outcome of these negotiations. But the business models are changing so fast, that it has been difficult for anyone to keep up. Every now and then, celebrities have a standoff with one of the tech giants in defense of the right of artist to be paid their fare due. For instance, at the time of writing, Canadian singer Taylor Swift has arm-wrestled Apple Music into ensuring that all artists would receive payouts from the use of their music during a free trial period of Apple's new music streaming service (Bajarin, 2015, para. 5). How long does it take, however, before new models of online music distribution shuffle the cards again?

What is noteworthy, however, is that taking a hard line to negotiate in the music business actually far predates online retail wars. In 1991, Canadian singer/songwriter Loreena McKennitt famously made a trailblazer deal with Warner Music that came to be known in the industry as the "Loreena McKennitt Deal" (Schlansker, 2008,~12min30sec). This exceptional agreement – recognized not just in Canada but worldwide – gave

McKennitt the right to retain full creative control over her albums, which she financed herself: Warner was to act solely as the distributor, without any oversight on content, studio production and even on the touring that followed. An experienced business woman, McKennitt was able to secure this deal herself – without any publicity stunt – because, by the time Warner Music discovered her, she had independently sold over 70,000 copies of her records. How McKennitt did this illuminates the fourth case study.

Loreena McKennitt started busking in Toronto in the early 1980s. On the streets, people would often ask her if she had a record. She would answer, "If you would, sign this piece of paper and give your name and your address, [and] when I have a record, I'll be in touch" (Schlansker, 2008,~10min15sec). In 1985, she borrowed money from her family and made her first recording in one week in a studio in a barn in southern Ontario. She ran off about thirty cassettes at a time that she would give to family and friends, and sell in small bookshops in a little display that she designed herself to hold two dozen cassettes. The bookshops would ask her to refill these displays every 2 or 3 days. Before she knew it, the record went gold. Then, she made another record and it went gold, too (~10min45sec). By the early 1990s, major record companies were beginning to notice her homespun success: it was because she had obtained gold certifications that she was able to negotiate with the music industry moguls on her own terms.

For all intents and purposes, what Loreena McKennitt did to launch her career can be described as a public interaction strategy. She went out in real public space to play her music with a harp and interacted with her audience face-to-face, taking down their contact details one by one to extend this public interaction beyond real time and situated space. Here, data output was the music and data input was a list of names and addresses. Over the years, McKennitt used the information she stored in this database (i.e. an address book) to build an extensive mailing list of her fan base, which she then used to post quarterly newsletters that gave readers timely information about her upcoming albums and tours for almost two decades; this newsletter also allowed people to buy her albums by post. Online digital tools certainly facilitated the self-management of her career in later years. However, in the fledgling year of her independent record label startup, she used only analog media while she was busking (i.e. a small, portable loudspeaker to amplify her music), as a means of distribution (i.e. audio cassettes), to

collect people's contact details (pen and paper) and to inform them with a newsletter (paper-based mail-outs).

At this point, it is important to mention the following fact. Since 1995, I have worked freelance for Loreena McKennitt, translating some of her promotional material for her French fan base, her press releases and her many French-language websites. Over the past twenty years, I have followed her trajectory as an accomplished artist and self-made business woman, and served as an interpreter when she has come to Montréal to meet her fans. Having been privy to the fine details of how she runs her record label and day to day business, I have become familiar with how she came to use analog technologies, and later digital technologies to self-manage her career and be the architect of her international success. Because of this insider knowledge, and more importantly, because Loreena McKennitt's career had provided me with first-hand evidence that technologies can be appropriated by musicians to advance their career, I was uniquely positioned to look at Mégaphone as a tool that might serve such a purpose. This background information helps to explain how and why my status as a participant observer took an altogether different turn towards the end of the deployment: I became personally involved in helping a close friend appropriate Mégaphone. In doing so, I provoked the conditions for a design-in-use to emerge *from* this field study.

This last case study shows how an independent music artist based in Montréal utilized a very similar public interaction strategy than Loreena McKennitt to advance her own music career and record label, with the caveat that this contemporary artist used the affordances of digital media, at the Mégaphone and online. It also documents how being a participant observer brought me to explore a form of research-creation in HCI design.

Bootstrapping Online Presence with Digitally-Augmented Offline Presence

Just after 7:00 pm, on Saturday, November 2, 2013, *Briga* aka Brigitte Dajczer, a local independent music artist, showed up at the Mégaphone holding only a violin. The first half-hour of that evening had been scheduled as a short open mike session, which preceded a free one-hour stand-up comic show by the popular Québécois comedians, *Les Zapartistes*. This had been programmed as the special feature closing event of the three-month deployment. Their show had been heavily publicized for weeks in advance

on the Mégaphone official website and on social media sites; it was expected to draw a big crowd into the agora. I counted on average about 80 people in the agora from 7:30 pm to 8:30 pm, with approximately 60 people already sitting on the benches at 7:15 pm.

Briga has been a friend for over fifteen years. Throughout the years, Briga and I have had several conversations about how she could use similar strategies as Loreena McKennitt to garner public attention and widen her fan base. I also encouraged her to use online tools to self-promote, self-manage and self-produce her artistic career. For instance, we had several conversations about trying out online crowdfunding websites to finance the production of her albums. She looked into this possibility in 2013, when she was composing songs for her next album. And indeed, Briga launched a crowdfunding campaign in fall 2013 because she knew that she would need more money to record and promote this album, than the small amount she had set aside for this. In October 2013, I received an email from her inviting me to contribute to her campaign. I made a small financial contribution and then invited her to come and see the Mégaphone. In particular, after observing how people appropriated Mégaphone for several weeks, I suggested to Briga that she might want to come and perform during open mike to promote herself.

Quite overwhelmed with her crowdfunding campaign and the shows she was playing, she did not have much free time that autumn. But she did come for a few minutes during an open mike session on Friday, October 18, 2013. I was busy taking field notes so we did not have much of a chance to speak about it that night, but she later told me over the phone that she had been very intrigued by the installation. I then suggested to her, once again, that she could come to play during an open mike session. But then I had the idea that I could film her performance with the field camera I had at my disposal, and give her a copy of this video to post online. Briga liked the idea but was too busy to make time that week-end or the next.

Then I realized that there would likely be a large audience turnout the evening the well-awaited closing event was featured to play at Mégaphone. I told Briga about this and at the last minute, she decided to sneak in during open mike and play one of her own compositions about fifteen minutes before *Les Zapartistes'* act began. She hoped

that this would help her raise public awareness around the crowdfunding campaign she had been running by word-of-mouth (B. Dajczer, interview, 27 December 2013,~5min):

> At that time, I was trying to get the word out that I was fundraising my new album. I had been using a crowdfunding site called INDIEGOGO™ for two weeks. I had exhausted my social media contacts as well as my email lists and all my friends, so I was looking for a rooftop to shout out from to shore up donations…I went down to that space just thinking I would ask people in the audience to check out my crowdfunding site if they liked the music they heard…and it became a happening…because there was a large audience…but also because you can't just walk past the Mégaphone and ignore it, or ignore what's going on there…it's too huge! It inevitably catches the attention of people on the sidewalk and across the street. (B. Dajczer, interview, 27 December 2013,~0min30sec)

During the interview I conducted with her almost two months later, Briga explained that halfway into her crowdfunding campaign, contributions had been stagnating around $2,500. It is noteworthy that empirical crowdfunding research suggests that people who relaunch their campaigns more than once tend to report more positive outcomes (Greenberg & Gerber, 2014, p. 589). However, for practical reasons, it is a strategy that only a small percentage deploys (p. 588). Indeed, Briga did not intend to relaunch a second campaign because she had planned to record her album soon after her campaign would close. She wanted to focus on the creative work as soon as possible, so she needed to get on with it. But Briga also added that once she had seen the Mégaphone, on my suggestion, it occurred to her that it might indeed offer her a way to breathe new life into her campaign. She had found the installation space "laid back, relaxed, jovial and accessible"; she also mentioned that watching people try out the "Speakers' Corner" had reassured her and made her feel more confident about stealing the stage that evening (B. Dajczer, interview, 27 December 2013,~2min):

> This space had a special sense of community. It was interesting, actually, because when we say the word "community", what "community" are we talking about? Who is the community, right? And I think that, here, the community is the city: it's anybody who lives in Montréal, anybody who wants to be part of something that is bigger than them. And so what Mégaphone offered was that sense of community without a digital device – like a laptop or cell phone – and that is different than the sense of community that I get through FACEBOOK™, or that I used to get from MYSPACE™. When I was walking in from the street towards the stage, I could feel that this performance would expose me to a new community. (B. Dajczer, interview, 27 December 2013,~3min45sec)

She waited a few minutes for the "Speakers' Corner" to become available, and then came on to introduce herself, explaining to the audience that she was a local artist trying to raise money through INDIEGOGO™ to self-produce her next recording and she had come to play one song live for people to sample this new album. Once she took the stage, she realized that she needed someone to hold the microphone for her while she played the violin. She asked the person closest to her – a homeless man often present at Mégaphone – to hold the microphone while she performed as seen in Figure 6.11:

> All of a sudden, I had a partner in crime and this was somebody who I would not normally meet or talk to, but it was somebody who happened to be there. So here was another way in which I felt a sense of community. I wasn't expecting to meet anyone that I would be talking to on the street that would help me to present my project. But he did, and very spontaneously, we had an audience and became part of that space. (B. Dajczer, interview, 27 December 2013,~6min)

Briga had agreed to try out Mégaphone because she believed that online presence had limitations that this installation space could potentially help her overcome:

> The problem with social media is that it only goes to your networks and your networks are limited…I thought that playing at Mégaphone would allow me to reach a new audience in public space…going out there in public and having no idea who I am going to play for is way better than the Internet, …and even better than playing in a venue, because the venue is an extension of the Internet…in venues, walk-in crowds who don't know me only represent 2% of the audience but at Mégaphone, it's more like 98%. This increases my chances of finding new fans to follow me online. (B. Dajczer, interview, 27 December 2013,~41min)

Spontaneously playing in front of an audience at Mégaphone that night did expose a new audience to her music and crowdfunding project. Briga also thought that she would build on the buzz of her live performance by inviting this new public to discover the different online environments she typically uses to communicate with her fan base. Years of experience had taught her that online promotion is only effective when people have experienced her music in a live context:

> Having an online presence is not the be all and end all for an artist. People believe that it is all about the online presence. I don't believe this. As a self-managed musician who uses the Internet to reach my audience, I know that an online presence gets me 50% attention. My offline presence, which is when I go out into the public and I am shaking hands

with people and I am talking to people in real life: well, that's the other 50%. And I say this because I see that when I do too much of one or too much of the other, for instance, if I am locked in for a week and I am not going out to shows and interacting with people face-to-face, so if am facebook-ing or tweeting only, I don't get the same results unless I am doing both at the same time. (B. Dajczer, interview, 27 December 2013,~27min)

Did Briga's intervention at Mégaphone widen her fan base and help her find new campaign contributors? There was no data available to establish the former, but a content analysis of changes observed on her INDIEGOGO™ webpage gives us some insight on the latter. Before her appearance at Mégaphone, Briga's campaign had been stagnating at about $2,500, which represents 42% of her $6,000 campaign goal. By November 19, 2013, a little over two weeks after her appearance at the Mégaphone, she had raised a total amount of $2,796 through INDIEGOGO™, a difference of $296, which brought contributions up to almost 47% of her $6,000 campaign goal, as illustrated by Figure 6.12. This suggests that her public appeal for help in front of a live audience at Mégaphone on Saturday, November 2, 2013, did not have a significant impact on her online fundraising campaign. Figure 6.13 shows that, by the end of her campaign, Briga had raised a total of $5,010, which represented 84% of the amount she had set as a campaign goal. This means that between November 19 and December 6, 2013, she raised $2,214, which represents 37% of her $6,000 campaign goal, an amount almost as important as the amount she had reached when her contributions started to stagnate at the mid-point of her campaign. Indeed, the contributions made in the last 18 days of the campaign represent 44% of total contributions raised. The literature reports that crowdfunding contributions typically tend to fizzle out in the last weeks of a campaign (Solomon, Ma, & Wash, 2015, pp. 552-553). How can this rally during the last leg then be explained?

As is customary in crowdfunding best practices, Briga had self-produced a brief video prior to her campaign to post on her crowdfunding page Figure 6.12. It was a spinoff of Martha Rosler's (1975) famous *Semiotics of the Kitchen* video, playfully using the context of a cooking demonstration to explain what the funding campaign was about and how funds would be used; this home movie also sampled some short excerpts of the songs that she intended to record in her next album. I had captured Briga's live

performance at Mégaphone on camera and had this footage at home, but Briga had been too busy to come by after her performance at Mégaphone. She hoped that the live performance would give a boost to her campaign, but when she noticed that it did not, she came to get a copy of the footage and decided to substitute the original video material she had uploaded for the launch of her campaign with this new video of her performing a single song live at Mégaphone:

> I needed one last extra kick for my INDIEGOGO™ campaign, and I expected that performing in front of the audience at Mégaphone and asking them to contribute to my campaign would help. But I did not get the kind of result that I had hoped for. So when I got my hands on the video footage you had filmed, I decided to blast out this piece of me doing this live performance with all the stunning visuals of the installation space. This created an opportunity for me to send out new notices to all my campaign contributors and fans on my mailing list: through my FACEBOOK™, my TWITTER™ and my email account, I sent out a message saying that I had just added a new video to my INDIEGOGO™ campaign. (B. Dajczer, interview, 27 December 2013,~23min45min)

It is noteworthy that Briga used her FACEBOOK™ page and TWITTER™ handle to share this new video that linked up to her INDIEGOGO™ campaign webpage. Here, we see another example of how emerging digital hybrid spaces are produced by reposting content that, not only links, but also imbricates the different webpages that give an artist an online presence and identity. While Briga uses her FACEBOOK™ page and TWITTER™ handle as promotional tools to keep her fans abreast on the latest news about her recordings and touring, she was using her INDIEGOGO™ webpage as a financing tool to raise funds for her project. By imbricating them in this way, each of these tools begins to blend into one another in the sense that they extend the function of the other and the dividing line between them starts to become blurred: her FACEBOOK™ and TWITTER™ serve as a financing tool and her INDIEGOGO™ webpage serves as a promotional one.

During her interview, Briga discussed at great length how artists' online and offline presence "feed off each other" and how "the best way to communicate to my audience is by using both" (B. Dajczer, interview, 27 December 2013,~30min). Yet, she also remarked that she did not make much use of the large media façade because it did not have the kinds of affordances that could support her needs. For instance, although she noticed that some of her words randomly appeared on the façade while she spoke,

she actually felt that they did not add anything new to her intervention. When asked how it could be designed better for crowdfunding, she reflected on her own intervention:

> It would have been more useful for me during my intervention if, once I stepped up to the mike and announced who I was, the big façade would have printed out my name, what kind of music I play and maybe the name of my band. It would have been even greater if my artist website or FACEBOOK™ handle would have appeared on the façade. I would even say that any two or three keywords that people can do a search on to find me online would have been helpful information up on that media façade. (B. Dajczer, interview, 27 December 2013,~37min)

She added that it could also have published the QR code of her website or enable ways to quickly access information about her music, her concert dates and her albums. Asked if there were other ways that the design of the installation could be improved, Briga had an interesting response, which betrays her roots in studio arts:

> The question you are asking is loaded. Because it is produced with public money, I am guessing that any cosmetic improvement would follow a logic of gentrification. It would no longer have that spontaneous and makeshift feel that is conducive to a happening. It would become a normalized space. I would guess that there would be more advertising panels, for instance. It would also likely be more organized, perhaps too organized. Not only would people be signing up for a space online, but then you'd have large billboards around that downtown area which would be announcing a month in advance which artist is performing, etc. Inevitably, you would see the big marketing strategies being deployed. And all of a sudden it just wouldn't be as "guerilla" anymore. It would be absorbed into the City of Montréal's cultural programs. I think that this would take away the power of Mégaphone as the people's loudspeaker, the stage that anybody can use anytime. (B. Dajczer, interview, 27 December 2013,~48min)

Briga does not know if her performance at Mégaphone had an impact on its audience. But what she does acknowledge is that having easy access to Mégaphone allowed her to breathe new life into her crowdfunding campaign. She used some of the money she made on INDIEGOGO™ to record and print her third album which was launched in Montréal on May 1st, 2014; the rest of the money was used to pay for the production of professional quality promotional material seen in Figures 6.14, 6.15 and 6.16. It is noteworthy, however, that, contrary to what Briga had expected, effective results involved more than just doing the live intervention: here, documenting it to

bootstrap her online presence was what had an impact. As in the previous case studies, the power of digitally-augmented urban space was optimized when it was extended to online digital environments, in this case, with a catchy video filmed in a public space.

Gerber, Muller, Wash, Irani, Williams and Churchill (2014) presented a panel on crowdfunding at CHI 2014.[15] In her introductory statement, Gerber said that crowdfunding was like busking: both were practices that had been around almost everywhere in the world for most of history and across all denominations, including religious ones. A case in point was the example of the church hat being passed around during Sunday mass. Loreena McKennitt taught me that busking was a form of public interaction that could be extended in time and space. Briga's use of Mégaphone hypostasized this metaphor in a very unique way. In this case, the installation was used as a stage to extend her busking online by means of a digital recording. I asked Briga if she thought that her performance at Mégaphone had been a form of busking:

> You know I have busked before, and busking is actually tougher than playing at Mégaphone, because busking, is like standing on the corner of the street and trying to tell people that you have something to say – I don't mean just verbally communicating.., it could be by performing too. But you realize that passersby are either going to ignore you because it is awkward or people will turn around and acknowledge you. This could mean standing for a second and listening to you, or else maybe they will go as far as giving you money. But it is a very black and white reaction, whereas Mégaphone is more like a grey zone: I felt that everyone who passed by looked at me, everyone acknowledged my presence. Whether people were sitting down or not, the Mégaphone is too visible for passersby not to see you. Busking is not as welcoming because you are just not as visible. Mégaphone is a special context set aside for some people to step into the limelight while others are there to pay attention. It is welcoming to all who become part of that space. (B. Dajczer, interview, 27 December 2013,~8min)

Chris Anderson (2004) claims that the *long tail* has broken the tyranny of physical space: "What matters is not where customers are, or even how many of them are seeking a particular title, but only that some number of them exist, anywhere" (para. 38). Interestingly, Briga's intervention at the Mégaphone both confirms this and throws a wrench into this theory. Physical space still matters, maybe more than ever. Perhaps today's emerging digital hybrid spaces are structured by the concerted actions of well-organized offline actors who use online environments to "augment" these actions. This

aligns with the findings in Tufekci and Wilson's (2012) empirical study: although their analysis of survey data supports the idea that Internet and social media played a crucial role in Egypt's Tahrir Square protests, their broader analysis argues that it is the interplay between social media, mobile devices and satellite TV (p. 365) and the "complex intertwining of multiple online and offline spheres" (p. 376) that contributed to the formation of a new system of political communication in the Middle East and Africa.

This empirical study of Mégaphone over ten weeks supports the view that online digital technologies alone are unlikely to leverage social change, political action, more robust news-making or better economics, because they are all fundamentally about relationships and the coordination and collaboration between people. This chapter's field findings suggest that the key to harvesting the interactive potential of digital displays in public space and the poetics of public interaction in this century, lies in creating synergy between sustained offline and online digital practices, a synergy that can nurture and reignite what Fischer (2011) has called "cultures of participation" (p. 42).

In this sense, the research presented in this doctoral dissertation until now has served to further inform the *emerging digital hybrid spaces* framework by providing a new tool – namely the multisited design approach applied to public interaction in urban space – in order to critically examine some of the processes that might help shape communities and their social structures, a hybrid experience of space and new possibilities for a digitally-enhanced public sphere. Yet, most of the findings relate to a topographical range that is relatively local in that it is geographically relevant to a neighborhood or the city; few examples reached beyond this. How then, can we speak to the poetics of public interaction in relation to interactive public displays that are deployed in a model of space that can offer immersive, embodied experiences, but can also – as Chris Anderson (2004) suggested – break the tyranny of physical space?

This is a timely question. To answer it, it is necessary to build on a representation of the world that captures the ontological foundations of life in our day and age. Some of the authors that have prepared the groundwork for this are Appadurai (1990), Castells (1996), Marcus (1995) and Sassen (2006); McQuire (2008) has done so more specifically in relation to interactive urban technology. A key specialist in this field, he is

one of the team members of the University of Melbourne's Research Unit in Public Cultures (RUPC) which has been conducting a five year Linkage research project on this topic funded by the Australia Research Council. Spanning from 2009 to 2014, this investigation – articulated around Federation Square as its core-site – was dubbed "Large screens and the transnational public sphere". The project was a canvas to rethink how digital public displays, as networked communal platforms, could simultaneously support what Sassen (2009) refers to as *sited materiality* and *global span* (pp. 33-34).

The objective of this enquiry was to see how a transnational public sphere might find root across the emerging global infrastructure of large public screens by using network connectivity and transforming Federation Square into a transnational "live site". But RUPC research outcomes speak to much broader questions of design and use of interactive displays in a globalized world. During four months in 2014, I joined RUPC in Melbourne to extend this dissertation's research project beyond my doctoral work: Federation Square as yet another site constitutes a different way of conceiving this multisited design research project by placing the overall focus on transnational spaces.

Chapter 7.

Conclusion

> *But more generally, we are arguing that the movement from ethnographic engagement to design practice is inherently a conceptual and imaginative move, not a rote translation of empirical evidence into designed facts.* (Dourish & Bell, 2011, p. 87)

Ethnography is an inductive methodology that generates its own object of study through a series of encounters, while laying bare the modes of construction that are used to do so along the way. This implies that it is, as often as not, an open-ended exploration which consists of carefully documenting, not only a set of observations, but also a research process that will itself be submitted to scrutiny. In the early days of HCI research, many studies were concerned with optimizing design for ease-of-use, legibility or usability with approaches that have been criticized as being either too predictive or prescriptive (Rogers, 2004, p. 96). In the past decade, however, HCI design research has focused more on trying to understand users with high level conceptual tools and explanatory or generative methods that offer thick descriptions (p. 132). With this shift in thinking, the inclusion of an "Implications for Design" section at the very end of all HCI ethnographic inquiries has been seriously called into question (Dourish, 2006, p. 548):

> In reducing ethnography to a toolbox of methods for extracting data from settings, however, the methodological view marginalizes or obscures the theoretical and analytic components of ethnographic analysis. Ethnography is concerned with the member's perspective and the member's experience, but it does not simply report what members say they experience. Even in ethnomethodological ethnography, which rejects sociological theorizing in favor of explicating observable practice, ethnography makes conceptual claims; it theorizes its subjects, even if the theories presented are the subjects' own. To the extent that ethnography presents not simply observations but relationships between observations, it is inherently interpretive. Indeed, ethnography's outputs are often not analytic statements purely about members' experiences, but

about how members' experiences can be understood in terms of the interplay between members and the ethnographer. (p. 543)

According to this critique, in HCI, ethnography has at times betrayed its epistemological roots in several ways: first, when it is not practiced reflexively, but as "scenic fieldwork" that takes an objectivist stance; second, when it neglects the analytical aspects of ethnographic work which have a theoretical reach; third and more importantly, because ethnography is a tool best suited to providing understandings on social interaction and human-computer interaction, it should strive to construct an object of study around the *process of interaction* rather than the nuts and bolts of design (Dourish, 2006, p. 544).

Consequently, the real litmus text of this doctoral research cannot be how valid or factual the findings are, but instead, how well it fulfills these criteria. In regards to the first criteria, the field documentation and narrative mode aim to offer rich descriptions instead of prescriptively providing advice on how to design or evaluate. In regards to the second criteria, the micro-analyses dispersed throughout this narrative reflexively strive to make conceptual claims that theorize subject and object, while acknowledging some parallels in extant theory. As for the third criteria, it is up to the reader to decide whether the poetics of public interaction are implicitly evoked sufficiently enough to provide "models for thinking about those settings…and uncovering the constraints and opportunities faced in a particular design exercise" (Dourish, 2006, p. 549).

With this in mind, and in keeping with the shift in thinking in HCI research, which has seen "a move away from providing predictive and prescriptive approaches toward developing more analytic and generative ones" (Rogers, 2004, p. 127), this doctoral ethnography has served as the canvas to reflect on phenomena observed in-the-wild to consider the people, their interactions, the social environment, the artifacts, the events and the sites involved in the politics of technology design. The recurring themes and core insights that emerged from this empirical data informed the analyses, from which concepts are then generated by gradually moving from description to abstraction.

7.1. Multisited Design Applied to Infrastructures-as-Context

The main contribution of this doctoral work has been to test out the ethnographic approach called multisited design on the study of digital public displays in-the-wild; its scope has been to explore how this platform could better support new forms of public interaction in real time and urban space. The rise of ubicomp has seen HCI increasingly practiced in everyday environments in which tangible and social computing are enmeshed (Dourish, 2001, p. 33). With this shift, and in the wake of future cities, social interaction can no longer be reduced to the different forms that technology-mediated social participation takes online. It must now extend to embodied experiences within public space. In this sense, this work is based on the assumption that designers are poised to increasingly focus their analytical lens on how interactive technology might, on the one hand, extend its reach into urban settings beyond mobile HCI, and on the other hand, aspire to better serve end user's situated knowledge by including them in the design process.

Although so-called "smart cities" are beyond the subject of this dissertation, one could nevertheless see in this doctoral research, the seeds of a critique that rejects a definition of "smart" that refers only to big data and to the instrumental exchange of information. Instead, narratives told in this dissertation suggest that "smart" also finds its expression through the social, civic and emotional intelligence of citizens who, by appropriating technologies, not only show how they wish to use interactive devices, but also how technology could best meet their needs. Still at the dawn of this Millennium, empirical work on interactive urban technology stands as particularly pressing if we are to understand how smart cities might be designed to be as participatory and socially inclusive in urban space as Web 2.0 has been online. *Who shall imagine the participatory digital city?* is a burning question. As history bears witness, the input and agency of end users must be negotiated; it has never been a given in the design process. This multisited ethnography situates the design of interactive displays within the context of digital infrastructures, while identifying the stakeholders who are concerned by this field of research; by doing so, it demonstrates that all voices matter in this process. The main originality of this dissertation's contribution to knowledge is that it foregrounds the cultural construction of urban technology in-the-wild in such an infrastructural setting.

When interactive public displays are studied under the lens of infrastructures-as-context, they are understood to be a form of media architecture: urban technologies embedded in the built environment. As such, they can, and arguably should, be included in discussions on urban planning and architectural design. There are meaningful parallels to be made between those areas of research and this work. For instance, Rem Koolhaas' critique of urban technology highlights the idea that expert stakeholders should collaborate with consumers and city-dwellers to design smart cities because the latter's input is arguably what can make cities smarter (Shaw, 2014, para. 4). He deplores the fact that the rhetoric of smart cities smacks of condescension toward the users, while its proposed design treats them like infants: to be monitored, surveilled, controlled and told what to do by sensors, actuators and data (Koolhaas, 2014, paras. 4-5). Further, he cautions that, lest smart cities cradle a renewal of the public sphere, that is, of the places where people can reignite the political flame of civic life, they will be condemned to being as stupid as machines that merely relay information (para. 11). Without the collective intelligence of people, smart cities will not be. Koolhaas' rationale envisions a model for smart cities based on the relational Web 2.0, which goes against the fashionable Internet-of-Things paradigm where interaction with data and objects are foregrounded and driven by Web 3.0 – to be extended as a Physical Web (Jenson, 2014, p. 15).

Koolhaas' (1995) position is not new, however. Twenty years ago, he was already lamenting architecture and urbanism's failure to keep up with urbanization. Cities, he claimed, were constituted by formidable forces far beyond the reckoning of experts, who, rather than assuage their lust for power by attempting to make and control them, should learn to humble themselves to becoming their mere subjects and supporters (p. 971). To achieve this, the expert was to "no longer aim for stable configurations but for the creation of enabling fields that accommodate processes that refuse to be crystallized into definitive form…no longer be obsessed with the city *but with the manipulation of infrastructure for endless intensifications and diversifications, shortcuts and redistributions* [emphasis added]" (p. 969).

The celebrity architect was not unique in taking this stance. In the early days of the postmodern architecture movement, the Belgian architect, Lucien Kroll, had made

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this approach the *raison d'être* of his own practice by undertaking major design projects that continuously mutated as a result of the lived experience of those who used the buildings. Kroll's (1997) vision was that architecture was a political enterprise that should strive to amicably reconcile design contradictions without allowing them to obscure one another (p. 39). He felt that his architectural plans remained mere three-dimensional images until residents appropriated the spaces to develop their design through use and actions; embodied disorder, he wrote, was the only rational means of producing a sense of place (p. 41). Buildings were to be construed as living laboratories that support an ongoing design process. At its best, this is the rationale of the infrastructural approach.

The fieldwork undertaken in the course of this doctoral program provided a favorable context to experiment with tailoring a methodology that can account for the complexity of such infrastructures, in this case, the Quartier des Spectacles' one square-kilometer digital infrastructure – the core-site of all the empirical studies conducted in this work. Multisited design was practiced within this core-site and beyond: the multiple sites were not only places; they were also people, events, artifacts and virtual environments, with design research being their binding thread. Can this approach present advantages?

7.2. The Core-Site as a Research Laboratory

A focus on digital infrastructure draws attention to the question of context in design. The empirical fieldwork conducted in the Quartier des Spectacles between 2012 and 2013 provided a unique opportunity to examine the way digital technology might be used to support public interaction in real urban space, but it also revealed the dialectical character of infrastructure: the tug and pull and strain of ephemeral interactions against the permanent setup of display technology in the core-site *is what produced the new*.

Infrastructure – the "permanent" in this equation – is what is needed for design to make possible what Koolhaas (1995) calls the "staging of uncertainty", the "irrigation of territories with potential" and the "reinvention of psychological space" (p. 969). And so it is that digital infrastructures prove to be crucial to the making of urban technology, an argument demonstrated over and over again by Dourish and Bell (2011) – two HCI

practitioners that favor ethnographic methodologies because these include a social and cultural understanding of everyday practices wherever space and technology intersect.

This is why Chapter Three gives so much importance to a detailed description of the Quartier des Spectacles district. Its history, its technological park, its models for supporting the design and implementation of urban technology and its operations as a private-public partnership all provide a context for design that matters far beyond this doctoral work. Because it is host to a convergence of research groups that take urban development, interactive media and the city as objects of study, Montréal is a city that lends itself well to technology design research. In the course of this doctoral work, the Quartier des Spectacles has proven to be what it professes: a digital urban laboratory. For better and for worse, as not all the deployments are designs worth studying; there have been and still are, as has been briefly noted, a number of failed experiments.

Participant observation, the research method used in this research, presupposes that the investigator has established a good working relationship with stakeholders – whether they be end users, from the public sector or from industry – to address real-world problems as a researcher. Here, the investigator acts as a knowledge translator who produces ethnographies, which focus on design and its process. By collaboratively conducting research with actors that have different stakes in the design of urban technologies, the research process becomes an opportunity to bring together concerned stakeholders with diverging interests to form an epistemic relationship not *of* one another, but *with* one another. Given the inductive character of this process, results are situated, hyperlocal and non-generalizable. This implies that each locality – each neighborhood, borough and town – is its own experimental terrain for the design of interactive urban life: what does *digital diversity* mean *in this place*? In this regard, digital infrastructures can be construed as the praxis-based design context that enables end users, as community stakeholders, to imagine their own narrative of the participatory city, a narrative that is represented – albeit with a bias – by the participant observer in order that common ground may be laid out to meet all stakeholder groups.

7.3. Summary of Study Results

Study results during phase one and phase two examine the interactional aspects of digital public displays from different angles to build a more holistic understanding of key design issues that could open up new avenues for research. The analysis in phase one highlights how artists used crossmodal interfaces – also based on intuitive modes of interaction such as gesture, touch and speech – to design interactive installations that engage people beyond the ubiquitous single-user "social cocooning" interaction scenario. Those in phase two contribute to the literature by interpreting data on a large public display installation whose interaction modality is voice and sound; this in itself constitutes a timely contribution to the HCI literature since, at the time of writing, there are only a handful of studies conducted on voice-activated big screen technologies.

7.3.1. Phase One

By presenting examples of practice, Chapter Three aimed to show that ergonomic form factors can serve as entry points and social affordances to invite encounters and collaborations around an input interface. It also highlights how new media artists use touch-based and gesture-based input, as well as crossmodal interaction to bring to bear the relationship between the digital and the material, the intangible and the tangible, the invisible and the visible world. As with the assumptions that underpin Social NUIs, this chapter suggests that by developing interfaces from a relational perspective that takes into account collaboration, meaning, value and context, designing interactive digital public displays might foster alternative forms of encounters and of human-computer interactions in-the-wild. One objective here was to suggest that interactive technologies may call for a rethinking of interface design in terms of the peculiar context of public space. Concretely, this chapter describes five observations:

- interactive displays can be designed for human scale and reach
- interactive displays can be designed for multiple attention foci
- interactive displays can be designed for explicit and implicit interactions
- interactive displays can be designed for cooperation
- interactive displays can be designed for multimodal (input/output) content

Based on these first encounters with interactive digital public displays in the Quartier des Spectacles, it seemed clear that the social character of public space should be a core principle in a framework that aims to inform interface design for public interaction. On the face of it, it appears that this study focuses on ergonomic design factors such as the screen real estate size of an interface; its location within an installation; its shareability, that is, its ability to entice and accommodate as many users as possible; its ability to activate embodied interaction and a sense of immersiveness with the environment at large; how this interface rewards co-locatedness and cooperation; and finally its use of crossmodal perception to produce more evocative content. But, in fact, social factors – such as the public context of these interfaces and the relationship between people that results from this – are what structures the description of these physical affordances. It was research conducted during this phase that suggested that thinking about a framework of social affordances might prove useful in defining the contours of what constitutes public interaction around interactive displays.

7.3.2. Phase Two

Chapters Four, Five and Six interpret data on how diverse publics interacted with a large public display installation being triggered solely by voice and sound. By conducting this *in situ* qualitative research on this monumental-scale voice-activated "Speakers' Corner" deployed in real public space, this study contributes to the literature in several ways. First, it provides a detailed and illustrated description of the system design: its numerous components, its workings and its uses. Second, it also suggests alternative ways of designing urban interventions based on crossmodal interaction with voice-activated screen technology. Third, it demonstrates that "offline" locative technology – that is, technology that is not connected to the Internet – still has the potential to support different levels of engagement that can translate into an array of expressions of what might constitute public interaction. Fourth, by doing so, it highlights the interdependency and imbrication of offline digital experiences with online virtual ones, arguably helping to show how the relationship between online and offline systems might come full circle. Fifth, it proposes a methodological tool called the *emerging digital hybrid spaces* framework to trace such digital practices across sites. Sixth, it introduces a framework of nine social affordances specifically tailored to this type of platform:

- inclusiveness vs. exclusiveness
- mimesis vs. alterity
- co-locatedness vs. virtual representation
- publicness vs. privacy
- embodied interaction vs. extended presence
- situatedness vs. mobility
- architectural scale vs. immersive intimacy
- emergent happenings vs. programmed interventions
- public streaming vs. public archiving

Seventh, it validates and shows grounded examples of four public interaction strategies that already exist in the literature, namely self-representation, self-publication, self-archiving and self-promotion. And finally eight, it presents four design scenarios that highlight specific purposes for interactive urban technologies:

- a live social media site, which supports dialogical interactions in augmented urban space
- a commemorative urban media façade, which supports place-making and both implicit and explicit public interaction
- a news production platform for the Fifth Estate, which supports first-person digital recordings in public space
- a crowdfunding platform in the city, which supports the bootstrapping of online presence with digitally-augmented offline live interventions

All of these research results were drawn from the study of a single interactive artifact, Mégaphone, deployed in downtown Montréal during 37 evenings spread out over ten consecutive weeks. Every night, for at least four hours after dusk, observations were made about how people invested the space, creatively appropriated the system to meet their own needs, and produced live emerging digital hybrid spaces through rich situated interactions offline that might be later related online. By culling these results with data collected during the making of Mégaphone, its architectural integration, its onsite testing and five *post mortem* meetings with its chief designer, it was possible to obtain a deeper understanding of its design from a kaleidoscope of stakeholders' perspectives.

The main objective of this empirical study was to understand how system design can best support the creative appropriation of technology in public space. It generated findings that have been published in three peer-reviewed academic journals and five peer-reviewed international technology conference proceedings. In parallel with this, research results from Chapter Three were published in six peer-reviewed international technology conference proceedings. Finally, parts of Chapter Two that discuss the methodological approach are included in one peer-reviewed international conference proceedings. All these publications are listed in the Endnotes and References sections.

7.4. Limitations of this Doctoral Research

Although they are not meant to be generalizable, the empirical studies included in this doctoral dissertation were conducted within a major metropolitan city in Canada and, as such, the findings may or may not be applicable to other large cities within Canada, if not large cities in the United States, given the similar (though not identical) culture between the two countries. Yet it is likely that smaller towns or cities within these countries exhibit different practices when it comes to large digital public displays usage given the varying nature of community participation and distinct cultural practices as a result of smaller populations with different architectural spaces. It is also the case that other regions of the world such as Europe or Asia will likely exhibit different practices surrounding the use of interactive digital displays given their unique cultures and values. Future studies should analyze and compare such practices under the aegis of what this work has called "digital diversity".

Beyond the fact that the results are not generalizable, the most important limitation in this doctoral work concerns the danger of instrumentalizing the research methods used to try to help bridge the gap between expert designers and end users. In architecture research, Post Occupancy Evaluation (POE) has been used for several decades to collect data on how occupants experience the buildings they live and work in (Preiser, Rabinowitz, & White, 1988). This methodology consists of interviewing occupants individually or in focus groups to obtain feedback on their experience through a mix of quantitative and qualitative methods. The main critique of this approach is that although an assumption is made and set forth that interviewing and observing "end

users" will provide valuable data that can be used to improve the design of a given building, in fact, the research results can often be compared to how crowdsourcing has at times been instrumentalized: a compilation of data that is used to legitimize the idea that occupants have been consulted. Indeed, some say that POE actually can support gentrification and exclusion rather than help designers work beyond it; this is mainly due to how interviewees are recruited, but also because of how researchers tend to draw the composite portrait in alignment with the class interest of the expert stakeholders. This would be a fair critique of this doctoral work were it not for the fact that the principal investigator became deeply involved in the research process as a participant observer and collaborated with diverse stakeholders across class distinction, including activists.

Although the analyses are inherently biased because they have been subjectively interpreted and synthesized by a single person, namely, the principal investigator, empathy, coupled with a robust research method that relied on the triangulation of data as explained in Chapter Two, allowed the ethnographer to develop nuanced relationships with the diverse stakeholders involved. As well, it is noteworthy that the interviewee data is not presented as a composite portrait but as a multitude of individual views with little editing to respect each voice. By the end of this doctoral research, one of the considerations that came out of my reflexive critique was that in best practices, the ethnographer should ideally be involved in balancing all the stakeholders' perspectives and needs in an iterative design approach that takes place over the course of an extended period of time. This however, does not mean that the principal investigator should be permanently employed by one of the stakeholders, for this would necessarily cause conflicts of interest, and likely bias the research results. It is paramount that researchers who act as knowledge translators remain independent of the institutions and the end user communities they study in order to have the freedom to be critical. This, in turn, raises issues that crystallize as the third limitation of this work.

While it is important to look inside the box, it is equally important to look outside of it. Placing the object of study within the broader context of digital infrastructures is one way to achieve this, but there are other ways of digging deeper into the issue of context with tools that examine how power is distributed and negotiated at the macro level in relationship to the micro level. Critical theory is such a tool as is multi-sited ethnography

when it focuses less on HCI design and more on how resistance is encountered in the design process. These approaches allow investigators to compare different perspectives and the heterogeneous, decentralized views of the structure to describe how power is produced (flow) or interrupted (friction) between sites; where friction appears indicates where power resides (Tsing, 2005, p. 5-6). With such tools, the context of design can be called into question to be updated and reformed. This research agenda was not the aim of this work, but it nevertheless must have its place when innovation is truly the end goal, for it is a dynamic process that can only come about with some push and pull.

7.5. New Avenues for Research

On the face of it, this last limitation may seem outside the scope of this doctoral research, but it is actually part and parcel of the multisited design approach:

> What might happen if we started to think more critically about the "site" of ethnographic studies in HCI? In what ways can we separate the technical practices of one organization or set of users from those others with whom they interact, from whom they learn, and with whom they exchange information, artifacts, and people? We might, for example, reconfigure the ethnographic project in HCI by thinking of studies not as independent investigations, but rather as contributions to a broader ethnography corpus whose "site" is not a particular office, campus, or city within which technology is used, but rather the global technology culture itself, or the intersection between *cultures of technology production and consumption*. Certainly, this suggests that we might need some very different criteria for assessing the role and contributions of ethnographic studies [emphasis added]. (Dourish, 2006, p. 548)

Dourish's (2006) statement suggests that, within the corpus of multisited design research, most sites are geographically porous because we live in a globalized world. What *Wired's* Chris Anderson (2004) calls the "tyranny of physical space" was already broken long time ago as Appadurai (1990) demonstrated. Where does the site of a place, a technological artifact or a network of stakeholders begin or end in a world that is increasingly affected by other sites, near or far. During his interview, the Quartier des Spectacles' Chief Technology Officer observed, "the most important issue in interactive urban technology design in the future is connectivity and this means that fiber optics is the staple of digital infrastructure; there is no getting around this" (M. Charpin, interview,

9 January 2014,~18min45sec). Given that we live in interconnected cities, should not the multisited design of urban technology be an open-ended approach that constantly expands its core-site? With this in mind, the first two phases of this research on interactive displays presented in this dissertation should be construed as a springboard for a more ambitious investigation that extends on the design of displays at a global level within transnational "cultures of technology production and consumption". This speaks to one of the challenges of multisited design: it takes time and resources, and it remains open-ended.

Other new avenues for research proposed in this doctoral dissertation include refining the definition of the concept of public interaction; building on the five design observations expounded in phase one; developing and implementing the social affordances framework described in phase two; and better modelling the *emerging digital hybrid spaces* framework to more efficiently trace the web of relationships that are weaved online and offline through digital practices across sites. This dissertation has also engaged in constructionist revisions of existing frameworks that could be applied to the study of interactive displays, namely Oldenburg's (1999) *Third Place* paradigm, Vetere et al.'s (2014) *Social NUI* metaphor and Dutton's (2009) *Fifth Estate* trope. In doing so, it has served to further validate that these frameworks could be adapted or operationalized to orient the design of interactive digital public displays, but this time in the wild context of public space interaction. In this sense, research that further extends thirdplaceness, Social NUIs and real-world instantiations of the Fifth Estate may constitute interesting areas of possible inquiry for the study of this platform.

Endnotes

[1] Marcus (2014) talks about non-places as "hyper-regulated places where one should not dwell and is expected to be moving through," and remarks that the French anthropologist, Marc Augé, has argued that "infrastructures are by definition non-places".

[2] Constructionism can easily be confused with Constructivism. Both describe the activity of meaning-making, but the former emphasizes the social aspect of a collective process, while the latter tends to be more narrowly used to signify how one subject individually engages with objects in the world to make sense of them (Crotty, 1998, pp. 57-63, p. 78-80). This doctoral dissertation discusses Constructionism as an epistemological position, defined as a paradigm of knowledge in which "*all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context* [*sic*]" (p. 42). While this dissertation makes the claim that it is derived from a constructionist epistemology, it is noteworthy that some of the works cited are self-proclaimed as constructivist: Feenberg (1995), Feenberg, (1999), Feenberg (2000), Marcus (1986), Marcus (1995), O'Hara, Harper, Mentis, Sellen and Taylor (2013) and works empirically related to the Social NUI approach.

[3] Since 2006, Dourish has argued in a number of his publications that the "implications for design" research model that has come to be expected in HCI studies is far too constraining to be applied as a template in ethnographic research. He goes more deeply into this argument in Dourish and Bell (2011), where he argues that it is particularly a problem in ubicomp research (p. 64). Some experts interpret this to mean that Dourish outright proscribes implications for design or an "implications for design" section in HCI studies conducted under an ethnographic methodology, but this appears to be a misreading of his writings. What Dourish actually defends is the idea that, on the one hand, higher level abstractions that are not specific to a device but that more broadly refer to a cultural practice may themselves constitute implications for design (p. 84), and on the other hand, that the focus of such HCI studies should be on the *engagement* between ethnography and ethnographic results if this methodology is to deploy its full potential for design practice (p. 87). Differently put, Dourish advocates that ethnographers should be given more licence in HCI in how they analyze, interpret and report their field observations: this can mean not making implications for design or it can mean presenting them as cultural practices without adopting the traditional HCI format of listing them in one section.

[4] Some of the material in this section of Chapter Two, including its two first subsections, was originally published in "Producing new media ethnographies with a multi-sited approach" authored by Kate Hennessy, Claude Fortin, Aynur Kadir, Reese Muntean and Rachel Ward as a conference proceeding at the *21st International Symposium for Electronic Arts 2015* (August 14-18, 2015, Vancouver, Canada), 8 pages (see References). Reprinted by permission of ISEA 2015 and the co-authors of the work.

[5] This first section of Chapter Three, including its three subsections, was originally published as the chapter "Digital public infrastructures for creative communities" authored by Claude Fortin, Kate Hennessy and Carman Neustaedter, in the volume entitled *Ambient Screens: Large Screens and Transnational Public Spaces*, edited by Nikos Papastergiadis. Hong Kong: Hong Kong University Press, 2016. Copyright © 2016 by Hong Kong University Press (see References). Reprinted by permission of Hong Kong University Press and the co-authors of the work.

[6] Some of the material in this section and the next section of Chapter Three, including all their subsections, was originally published in "Designing interfaces to experience interactive installations together" authored by Claude Fortin and Kate Hennessy, as a conference proceeding at the *21st International Symposium for Electronic Arts 2015* (August 14-18, 2015, Vancouver, Canada), 8 pages (see References). Reprinted by permission of ISEA 2015 and the co-author of the work.

[7] Here, the term "space syntax" is used more loosely than its original prescriptive definition as a methodology pioneered by Hillier & Hanson (1984), which largely relies on mathematics.

[8] In reference to grounded theory, Pidgeon & Henwood (2003) write that "the special counsel that remains within grounded theory is to avoid being wedded to particular theoretical positions and key studies in the literature in ways that overly direct ways of looking and stymies the interactive process of engagement with the empirical world being studied" (p. 138). This is proposed with the caveat that extant theory that is already well known by the investigator(s) may sometimes be brought to bear to assist the process of data collection.

[9] Some of the material in this section of Chapter Five was originally published in "Unintentional design: How some citizens appropriated Mégaphone in public and virtual space" authored by by Claude Fortin and Kate Hennessy as a conference proceeding at the *Third Conference of the CCA Technology and Emerging Media Track* (May 28-30, 2014, Brock University, St. Catharines, Canada), paper 5 (see References). Copyright is held by the authors under a Creative Commons Attribution-NonCommercial-NoDerivatives 3.0 International License. Reprinted with permission of the co-author of the work.

[10] According to Beiguelman (2009), cybrid configurations are "situations resulting from the on- and off-line networks' interconnected experience, that occur in the traffic mediated by control systems, electronic panels, cell phones, PDAs and intelligent agents" (p. 180) (see Glossary).

[11] Except where stated otherwise, some of the material included in Chapter Six was originally published in "The appropriation of a digitally-augmented agora: Field study of the structuration and spatialization of an issue public in urban space" authored by Claude Fortin and Kate Hennessy for the *Canadian Journal of Communication*, Vol. 40, No. 4, 2015 (see References). Reprinted by permission of the Canadian Journal of Communication and the co-author of the work.

[12] Some of the material in this section of Chapter Six was originally published in "The appropriation of a digital Speakers' Corner: Lessons learned from the deployment of Mégaphone" authored by Claude Fortin, Carman Neustaedter and Kate Hennessy, as a conference proceeding at the *Tenth ACM International Conference on Designing Interactive Systems 2014* (June 21-25, 2014, Simon Fraser University, Vancouver), New York, NY: ACM Press, 955-964. doi:10.1145/2598510.2598534 (see References). Reprinted by permission of ACM Publications and the co-authors of the work.

[13] Some of the material in this subsection of Chapter Six was originally published in "The dual skins of a media façade: Explicit and implicit interactions" authored by Claude Fortin and Kate Hennessy for *Leonardo*, Vol. 48, No. 4, 2015. doi:10.1162/LEON_a_01088 (see References). Reprinted by permission of Leonardo/ISAST and ACM/SIGGRAPH and the co-author of the work.

[14] Some of the material in this subsection of Chapter Six was originally published in "The Maple Spring as the background for the flourishing of the Fifth Estate in Québec or how the Millennials appropriated interactive digital technologies to rise up and politically engage" authored by Claude Fortin for *Stream*, Vol. 6, No. 1, 2014 (see References). Copyright is held by the author under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

[15] Williams was in fact absent because she had unexpectedly been held back in Shenzhen.

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Appendix A.

Informed Consent for Phase One (English Version)

Description

This appendix reproduces the English version of the Informed Consent Form used in phase one of this doctoral research project.

Informed Consent Form

Title of study:	An exploration of human-computer interaction factors in urban screens as a public networked technological system intended for community development
Ethics Application Number:	[2012s0737]
Principal Investigator:	██████████ MA, Doctoral student at the School of Interactive Arts & Technology (SIAT), Simon Fraser University (SFU), Vancouver, BC. ████████████████
Supervisor and Co-investigator:	██████████ MA, PhD, School of Interactive Arts & Technology (SIAT), Simon Fraser University (SFU), Vancouver, BC. ███████████████

The Simon Fraser University Research Ethics Board has approved this research study on October 30th, 2012 and insures its follow up until its completion date on October 29th, 2015. In addition, it will be responsible for approving any modifications or revisions made to the consent form or to the study protocol that are requested.

This consent form, a printer-friendly copy of which has been made available to you online, is part of the process of informed consent. It should provide you with basic information on what this research study is about and what your participation will involve. If you would like more details about something mentioned in this document, or information not included here, you should feel free to ask the principal investigator (PI), ██████████ a doctoral student at Simon Fraser University's (SFU) School of Interactive Arts & Technology (SIAT). However, before accepting to participate in this study, we would ask you to please take the time to read, understand and carefully consider the following information.

Purpose:

The purpose of this research is to understand how people use social media networks and ubiquitous information and communication technologies to form, develop and foster communities. This includes understanding their perception and usage of technological platforms such as mobile phones, smart phones and digital public displays in urban environments. It also includes identifying cognitive, physical, aesthetic, spatial and social human-computer interaction (HCI) factors related to these technologies. The investigators will use the information collected

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and analyzed in this study to write descriptive reports proposing principles, and conceptual frameworks that aim to improve the design of public networked technological systems.

Participant Recruitment and Selection:

To be recruited for this study, you must be at least 19 years of age and should be comfortable discussing how you use social media networks and information and communication technologies (ICT) to exchange and interact with different types of virtual or physical communities, such as, for instance, communities of knowledge, of practice, of support, of political interest, and of cultural and creative exchange.

What Will I Be Asked To Do?

Interviews conducted in person

In the case of interviews conducted in person, during an interview that will take between 45 to 90 minutes, we will ask you questions about your perception and usage of social media, as well as digital information and communication technologies (ICT), to evaluate the quality of your experience and how useful it has been in forming community networks, share information and engage in collective action.

Online information exchange or contributions

In the case of online information exchange or contributions such as participation in an online survey or online social media discussion group, you may contribute your comments or answer questions about your perception and usage of social media, as well as digital information and communication technologies (ICT), to evaluate the quality of your experience and how useful it has been in forming community networks, share information and engage in collective action.

In the case of online information exchange or contributions such as online participatory geolocation sensing or online participatory network analysis, you may — for limited periods of time during which you voluntarily log on and log off — communicate information regarding your geographic position as you move within the perimeter of the Quartier des spectacles, or the number of interactions you have with an urban screen interface or with other users participating in activities — such as multi-player video games — on these urban screen interfaces.

What is the Nature of Your Participation?

Participation is voluntary. If you agree to participate, you will be free to withdraw at any time for any reason. However, unless you explicitly request otherwise, data collected up to this withdrawal point will still be retained and could be used by the investigators.

Are There Risks if I Participate?

The risks of participation are intended to be none or minimal, that is, no greater than those encountered when interacting with others in everyday life. For example, if answering certain questions may involve the divulgation of details about your lifestyle or personal views, you can choose to reveal only information that you are comfortable with sharing. Throughout the study and publication process, your anonymity will be strictly maintained unless you explicitly grant the principal investigator permission to use your likeness in publications and presentations. If you participate in an in-person or online group interview, all participants will be asked not to discuss other's responses outside the group to ensure privacy and confidentiality.

Are There Benefits if I Participate?

You and others will indirectly benefit from your participation in that your contributions to this study will be used to improve the design of technological systems intended to help build stronger community ties and support networks. Research results, such as published papers will be made available through the principal investigator, ██████████████████ and/or ██████████

How Is Information Collected and What Happens to the Information I Provide?

Your anonymity will be strictly maintained. The only personally identifying information collected will be the net name you choose to be identified under and the email address you give the principal investigator for the purpose of contacting you to schedule an interview. All the data with identifying information collected by the principal investigator will be encrypted with an anonymous participant ID and the encryption code will be stored securely in the password-protected electronic research servers of Simon Fraser University's School of Interactive Arts and Technology (SFU - SIAT). When participatory online focus group discussions are used as a form of interviewing, online information will be exchanged over a secure server located in Canada to ensure that the identities of all participants are kept confidential.

In the case of an interview conducted in person, the interview may be audio-recorded, photographed or videotaped and later transcribed into written form. Only the principal investigator will have access to these audio and/or visual recordings, and transcriptions as reference to validate results. If a participant chooses to grant the investigators written permission to use their voice and/or likeness in publications and presentations as outlined at the end of this Informed Consent Form but asks to preserve their anonymity, these recordings will be electronically manipulated afterwards to mask the participant's voice and/or likeness. After the study has been completed, the principal investigator will securely retain this Informed Consent Form as well as audio-recordings, photographs, videotapes and transcriptions that exist on paper or material support in a locked cabinet located in ████████████ SFU - SIAT locked office for a period of five years and then will be destroyed in November 2020.

Data in digital form — which may include de-identified text, images, and audio — will be encrypted and stored securely in the password-protected electronic research servers of Simon Fraser University's School of Interactive Arts and Technology (SFU - SIAT) in the principal investigator's research account and/or on a password-protected hard drive that is the sole propriety of the principal investigator and that will be kept securely in a locked cabinet located in ████████████ SIAT locked office. This digital data will also be retained for a period of five years and destroyed in November 2020 by permanent removal from the database of the principal investigator's research account and/or of the password-protected hard drive.

Publications and presentations interpreting this data will be produced in the context of academic research. These will primarily present the results in an aggregate form or as caricatures that are composites of one or more participants. Where individual participant data is disclosed, such as exemplar interview comments or quotes, the investigators will ensure that the selected data does not suggest the participant's identity. Video, audio, and photographs will normally obscure or mask out any information within this data to ensure that the participant's identity is not revealed.

In the event that video, audio, or images from your interview could eventually be used in unaltered form for the publication or presentation of findings — for instance, in the creation of a documentary video in which you may be identified — you can optionally grant the investigators permission to use unaltered video/audio/photographs by checking "yes" in both of the two boxes below.

Optional Permission to Use Records of Your Likeness in Unaltered Form :

I grant the investigators permission to photograph, audio-record, and video-record me:

Yes: ___ No: ___

I grant the investigators permission to use images or sound of my visual, audio or video likeness from my interview in the context of research publications and presentations.

Yes: ___ No: ___

Acceptance of this Form:

Your signature on this form indicates that you:

1) understand to your satisfaction the information provided to you about your participation in this research project;

2) understand that you may ask questions for clarification or new information at any time throughout your participation in this study;

3) understand that you may also withdraw your participation at any time and for any reason;

4) understand that in no way does this waive any of your legal rights;

5) understand that by filling out a survey, questionnaire or form other than this Informed Consent Form, you are consenting to participate in this study ;

6) understand that *Montreal's Quartier des Spectacles Partnership* has given the principal investigator permission to conduct this study in collaboration with them ;

7) agree to be a research participant.

Net name/pseudonym: _____ Email address: _____

Participant's Name: _____ Date: _____

Participant's Signature : _____

Questions/Concerns: If you have any concerns about the way you've been treated as a participant or concerns with the research project, please contact (primary contact) ███████ ████████ Assistant Professor, School of Interactive Arts and Technology (SIAT) at ████████████████████████, or (secondary contact) ███████████ Director, Office of Research Ethics at: ███████████████████.

Appendix B.

Informed Consent for Phase One (French Version)

Description

This appendix reproduces the French version of the Informed Consent Form used in phase one of this doctoral research project.

Formulaire de consentement éclairé

Titre du projet de recherche: Étude des éléments de l'interaction personne-machine vis-à-vis de téléphones portables et d'interfaces d'affichage dynamique en milieu urbain conçus comme formant un réseau public destiné propre à renforcer les réseaux sociaux.

No. du dossier d'évaluation éthique: [2012s0737]

Chercheure principale: ████████ M.A., Doctorante au School of Interactive Arts & Technology (SIAT), Université Simon Fraser (SFU), Vancouver, C.-B.
████████████

Superviseure et co-chercheure: ████████ M.A., Ph.D., Professeure et chercheure à SIAT, Université Simon Fraser (SFU), Vancouver, C.-B.
████████████

Le comité d'éthique de la recherche de l'université Simon Fraser a approuvé ce projet de recherche le 30 octobre 2012, et il en assurera le suivi jusqu'à la fin prévue le 29 octobre 2015. Il est de plus tenu d'approuver toute révision ou modification qui serait apportée à ce formulaire d'information et de consentement ou au protocole de recherche requis.

Ce formulaire de consentement, accessible en ligne et que vous pouvez imprimer, fait partie de la démarche assurant un consentement libre et éclairé. Il vise à vous expliquer les objectifs et les grandes lignes de cette étude, et ce en quoi consisterait votre participation si vous décidiez de participer. Si vous avez besoin de renseignements supplémentaires sur les informations comprises (ou manquantes selon vous) dans ce document, n'hésitez pas à demander des clarifications ou des explications détaillées à la Chercheure principale (CP), ████████, doctorante au School of Interactive Arts & Technology (SIAT) de l'Université Simon Fraser (SFU). Mais avant tout, et surtout avant d'accepter de participer à ce projet de recherche, nous vous demandons de prendre le temps de lire attentivement les renseignements qui suivent afin de bien les comprendre et d'y réfléchir sérieusement.

Buts de la recherche:

Cette étude a pour but de mieux comprendre comment les gens utilisent les médias sociaux et les technologies de l'information et de la communication (TIC), omniprésentes dans le monde d'aujourd'hui, pour former, entretenir et développer des réseaux sociaux. Elle vise également à

analyser leur perception et leur utilisation des plateformes technologiques telles que les téléphones portables, les téléphones intelligents et l'affichage dynamique en milieu urbain. Cette étude a également pour but d'identifier certains aspects cognitifs, physiques, esthétiques, spatiaux et sociaux qui entrent en jeu dans les interactions personne-machine (IPM) en rapport avec ces technologies.

Les chercheures utiliseront les données recueillies et analysées dans le contexte de ce projet de recherche, d'une part pour élaborer des cadres théoriques, d'autre part pour rédiger des rapports descriptifs exposant des principes de base, l'ensemble visant à améliorer la conception des systèmes informatiques en réseaux publics.

Recrutement et sélection des participant(e)s:

Pour être admissible à participer à ce projet de recherche, vous devez être âgé(e) d'au moins 19 ans. Vous devez également vous sentir capable de parler ouvertement de la façon dont vous utilisez les médias sociaux et les technologies de l'information et de la communication (TIC) pour échanger et interagir avec d'autres personnes sur des réseaux sociaux virtuels ou physiques formant différents types de communautés ; il peut s'agir de communautés de savoir et de pratique, de communautés de soutien, de communautés engagées dans des activités de création, et/ou de communautés ayant des intérêts culturels ou politiques.

En quoi consistera votre participation?

Entrevue en personne

Dans le cas d'une entrevue réalisée en personne, la séance sera d'une durée de 45 à 90 minutes. Durant celle-ci, la chercheure principale vous posera des questions sur votre perception et votre utilisation des médias sociaux, et aussi des questions sur votre perception, votre utilisation et votre appréciation des technologies de l'information et de la communication (TIC) ; elle vous demandera notamment d'évaluer l'utilité de ces technologies dans la création de réseaux sociaux, le partage d'information et/ou l'engagement dans des actions collectives.

Échange ou partage d'information en ligne

En cas d'échange ou de partage d'information en ligne, soit par le biais d'un *sondage* en ligne, soit par le biais d'un *groupe de discussion* au sein d'un réseau social privé en ligne, vous pourrez livrer vos commentaires ou répondre à des questions portant sur votre perception et votre utilisation des médias sociaux ainsi que sur les technologies de l'information et de la communication (TIC); vous pourrez également donner votre appréciation des technologies que

vous utilisez, notamment votre appréciation de leur utilité dans la création de réseaux sociaux, dans le partage d'information et/ou dans l'engagement dans des actions collectives.

En cas d'échange ou de partage d'information en ligne, que cet échange prenne la forme d'une *participation volontaire à des analyses de géolocalisation*, ou la forme d'une *participation volontaire à des analyses de réseaux*, vous aurez la possibilité de communiquer — pour les périodes de temps limitées durant lesquelles vous vous connectez et vous déconnectez — des informations concernant soit votre position géographique pendant vos déplacements dans le Quartier des spectacles, soit le nombre d'interactions que vous avez avec des interfaces d'affichage dynamique en milieu urbain ou avec d'autres utilisateurs participant à des activités sur ces mêmes interfaces d'affichage dynamique en milieu urbain ; il peut s'agir, par exemple, de jeux vidéo impliquant plusieurs joueurs.

Quelle est la nature de votre participation?

Votre participation est tout à fait libre et volontaire. Si vous acceptez de participer, il est entendu que vous pourrez à tout moment mettre un terme à votre participation, et cela pour quelque raison que ce soit et sans avoir à vous justifier. Cependant, à moins que vous fassiez expressément une demande contraire, les données recueillies jusqu'au moment de votre retrait seront conservées et pourront être utilisées par les chercheures.

Quels sont les risques si je participe?

Votre participation à ce projet de recherche ne devrait vous faire courir *aucun risque* que ce soit, sinon le risque minimal inhérent à toute interaction humaine dans le cadre de la vie quotidienne. Par exemple, si certaines questions risquent de vous amener à révéler vos opinions personnelles ou à donner des détails sur votre mode de vie, vous êtes tout à fait libre de ne donner que les informations que vous vous sentez à l'aise de partager.

Par ailleurs, sachez que pendant toute la durée du projet de recherche et du cycle de publication, votre *anonymat* sera respecté à moins que vous n'autorisiez explicitement la chercheure principale à faire usage de votre voix ou de votre image dans des publications et présentations.

Si vous participez à des *entrevues de groupe*, en personne ou en ligne, la chercheure principale demandera à tous les participant(e)s de s'en tenir à la stricte confidentialité vis-à-vis de ce qui aura été échangé en évitant d'en parler à l'extérieur du groupe de discussion, cela afin que la vie privée de chacun soit respectée.

Quels sont les bénéfices potentiels si je participe?

Vous et les autres participant(e)s pourrez retirer un avantage personnel indirect de votre participation en ce sens que vous contribuerez à l'avancement des connaissances dans ce domaine et que les résultats obtenus seront utilisés pour améliorer la conception des systèmes informatiques voués au développement de réseaux sociaux plus solidaires et offrant davantage de soutien.

Les résultats de la recherche, notamment les publications, seront accessibles par l'entremise de la chercheure principale, soit ██████████████████████ et/ou ████████████

Comment sont recueillies les données et qu'arrive-t-il aux informations que je fournis?

Votre anonymat sera strictement respecté. Les seules informations recueillies, qui permettront à la chercheure principale de vous identifier, seront le nom internet que vous choisirez et l'adresse de courriel que vous donnerez à la chercheure principale pour lui permettre de communiquer avec vous afin d'organiser une entrevue. Tous les renseignements recueillis par la chercheure principale permettant de vous identifier seront protégés grâce à un cryptosystème à clé secrète. La clé du code reliant votre nom à votre dossier de recherche sera conservée en toute sécurité dans les serveurs informatiques utilisés aux fins de la recherche au School of Interactive Arts and Technology de l'université Simon Fraser (SFU - SIAT); et elle sera protégée par un mot de passe. Lorsque les entrevues seront effectuées en ligne par le biais d'un groupe de discussion volontaire, le contenu des échanges sera colligé sur un serveur sécurisé situé au Canada permettant que l'identité des participant(e)s demeure confidentielle.

Dans le cas d'une entrevue réalisée en personne, il est possible que l'entrevue soit enregistrée sur des bandes audio ou vidéo puis retranscrite sous forme écrite, ou que des photographies soient prises. Seule la chercheure principale aura accès à ces enregistrements sur bandes-son ou bandes-vidéo, et à ces transcriptions, le tout étant conservé à des fins de référence dans le but de valider les résultats. Si un(e) participant(e) choisit de donner aux chercheures l'autorisation écrite d'utiliser sa voix et/ou son image dans des publications et présentations tel qu'il est décrit à la fin de ce Formulaire de consentement éclairé, mais que cet(te) participant(e) demande que son anonymat soit préservé, ces enregistrements seront alors traités numériquement de façon à masquer la voix et/ou l'apparence visuelle de ce(tte) participant(e). Une fois le projet de recherche terminé, la chercheure principale conservera sous clé ce Formulaire de consentement éclairé ainsi que les enregistrements audio ou vidéo, les photographies et les transcriptions qui existaient sur support papier ou autre, dans un classeur verrouillé situé dans le bureau verrouillé de ████████████ à SFU - SIAT pour une période de cinq ans suivant la fin du projet. L'ensemble de ce matériel sera détruit en novembre 2020.

Les données sous forme numérique — qui peuvent inclure des textes, des images et des sons anonymisés — seront sauvegardées en toute sécurité, grâce à un cryptosystème à clé secrète, dans le compte d'accès Internet dédié de la chercheure principale sur les serveurs informatiques,

eux-mêmes protégés par un mot de passe, utilisés à des fins de recherche au School of Interactive Arts and Technology de l'université Simon Fraser (SFU - SIAT) ; et/ou sur un lecteur de disque dur protégé par un mot de passe qui est la propriété exclusive de la chercheure principale et qui sera conservé dans un classeur verrouillé situé dans le bureau verrouillé de ▮▮▮▮▮▮▮▮▮ à SFU – SIAT. Ces données numériques seront conservées pour une période de cinq ans suivant la fin du projet, après quoi, elles seront supprimées de façon permanente de la base de données de la chercheure principale et/ou du lecteur de disque dur protégé par un mot de passe, cela en novembre 2020.

Les données recueillies dans le cadre de ce projet de recherche seront interprétées pour être publiées dans des publications et présentations destinées à la recherche universitaire. Avant d'être diffusées dans de tels contextes, les données seront agrégées ou modifiées de façon à offrir des portraits composites représentant un(e) ou plusieurs participant(e)s. Dans le cas où des données pouvant permettre d'identifier un(e) participant(e) seraient utilisées, tel un commentaire ou un extrait d'entrevue par exemple, les chercheures s'assureront que les données en question n'autorisent pas une telle identification. À cette fin, lors de l'utilisation de ces données présentées sur support audio, vidéo ou photographique, les chercheures brouilleront ou cacheront toute information pouvant révéler l'identité des participant(e)s.

Par ailleurs, s'il s'avérait que des extraits de votre témoignage puissent servir dans le cadre d'un projet incluant la publication ou la présentation de données — par exemple dans un documentaire vidéo où vous pourriez être identifié(e) — vous pouvez, si vous le souhaitez, autoriser les chercheures à présenter telles quelles toutes les données sur support audio, vidéo ou photographique vous concernant, c'est-à-dire sans aucune modification, en cochant l'option « Oui » dans les deux cases ci-dessous.

Autorisation facultative d'utiliser tels quels des enregistrements reproduisant votre image ou votre voix :

J'accorde aux chercheures l'autorisation de me photographier ou d'enregistrer ma voix et/ou mon image sur support audio ou vidéo :

Oui: ___ Non: ___

J'accorde aux chercheures l'autorisation d'utiliser mon image et/ou ma voix, enregistrées sur support audio, vidéo ou photographique lors de mon entrevue, dans le contexte des publications et présentations destinées à la recherche.

Oui: ___ Non: ___

Consentement au formulaire:

En signant ce formulaire, j'atteste :

1) Que je comprends de façon satisfaisante les renseignements qui m'ont été fournis sur la nature de ma participation à ce projet de recherche ;

2) Que, maintenant ou à l'avenir, je comprends que je suis libre de poser des questions ayant pour but de clarifier ces informations ou toute nouvelle information en rapport avec ce projet de recherche ou avec ma participation à ce projet de recherche ;

3) Que je comprends que j'ai le choix de cesser de participer à ce projet de recherche à n'importe quel moment sans avoir besoin de me justifier ;

4) Que je comprends qu'en acceptant de participer à ce projet de recherche, je ne renonce à aucun de mes droits;

5) Que je comprends qu'en remplissant un sondage, un questionnaire ou un formulaire autre que ce Formulaire de consentement éclairé mais relevant également de ce projet de recherche, je consens à participer à ce projet de recherche ;

6) Que je comprends que le *Partenariat du Quartier des spectacles de Montréal* a donné à la chercheure principale l'autorisation de réaliser ce projet de recherche en collaboration avec lui ;

7) Que je consens par la présente à participer à ce projet de recherche.

Non internet/pseudonyme: _____ Adresse courriel: _____

Nom du ou de la participant(e): _____ Date: _____

Signature du ou de la participant(e): _____

Questions / commentaires: Si vous avez des questions, des commentaires ou des plaintes au sujet de vos droits en tant que participant(e) ou au sujet de ce projet de recherche, veuillez communiquer avec (première personne-ressource) ███████████, M.A., Ph.D, Professeure adjointe, School of Interactive Arts and Technology (SIAT) à : ██████████████████ ████████ ou (deuxième personne-ressource) █████████ Ph.D., Directeur, Bureau d'éthique de la recherche à: █████████████████████

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Appendix C.

Informed Consent for Phase Two (English Version)

Description

This appendix reproduces the English version of the Informed Consent Form used in phase two of this doctoral research project.

Informed Consent Form

Title of study:	Qualitative field evaluation of MÉGAPHONE, an interactive public space installation that includes architectural-scale digital displays intended to encourage free speech and community engagement through public speaking.
Ethics Application Number:	[2013s0730]
Principal Investigator:	███████████ MA, Doctoral student at the School of Interactive Arts & Technology (SIAT), Simon Fraser University (SFU), Vancouver, BC. ███████████████
Supervisor and Co-investigator:	███████████ MA, PhD, School of Interactive Arts & Technology (SIAT), Simon Fraser University (SFU), Vancouver, BC. ██████████████████

The Simon Fraser University Research Ethics Board has approved this research study on [date, 2013] and insures its follow up until its completion date on [date, 2016]. In addition, it will be responsible for approving any modifications or revisions made to the consent form or to the study protocol that are requested.

This consent form, a printer-friendly copy of which has been made available to you online, is part of the process of informed consent. It should provide you with basic information on what this research study is about and what your participation will involve. If you would like more details about something mentioned in this document, or information not included here, you should feel free to ask the principal investigator (PI), ███████████ a doctoral student at Simon Fraser University's (SFU) School of Interactive Arts & Technology (SIAT). However, before accepting to participate in this study, we would ask you to please take the time to read, understand and carefully consider the following information.

Purpose:

The purpose of this research is to understand how people use MÉGAPHONE to form, develop and foster communities. This includes understanding their perception and usage of this technological platform *in situ* in an urban environment. It also includes identifying cognitive, physical, aesthetic, spatial and social human-computer interaction (HCI) factors related to these technologies. The investigators will use the information collected and analyzed in this study to

write descriptive reports proposing principles, and conceptual frameworks that aim to improve the design of MÉGAPHONE and of similar interactive public space installation systems.

Participant Recruitment and Selection:

To be recruited for this study, you must be at least 19 years of age and should be comfortable discussing how you use social media networks and information and communication technologies (ICT) to exchange and interact with different types of virtual or physical communities, such as, for instance, communities of knowledge, of practice, of support, of political interest, and of cultural and creative exchange.

What Will I Be Asked To Do?

Interviews conducted in person

In the case of interviews conducted in person, during an individual interview or a focus group interview that will take between 45 to 90 minutes, we will ask you questions about your perception and usage of social media, as well as digital information and communication technologies (ICT), to evaluate the quality of your experience and how useful it has been in forming community networks, share information and engage in collective action.

Online information exchange or contributions

In the case of online information exchange or contributions such as participation in an online survey or online social media discussion group, you may contribute your comments or answer questions about your perception and usage of social media, as well as digital information and communication technologies (ICT), to evaluate the quality of your experience and how useful it has been in forming community networks, share information and engage in collective action.

In the case of online information exchange or contributions such as online participatory geolocation sensing or online participatory network analysis, you may — for limited periods of time during which you voluntarily log on and log off — communicate information regarding your geographic position as you move within the perimeter of the Quartier des spectacles, or the number of interactions you have with an urban screen interface or with other users participating in activities — such as multi-player video games — on these urban screen interfaces.

What is the Nature of Your Participation?

Participation is voluntary. If you agree to participate, you will be free to withdraw at any time for any reason. However, unless you explicitly request otherwise, data collected up to this withdrawal point will still be retained and could be used by the investigators.

Are There Risks if I Participate?

The risks of participation are intended to be none or minimal, that is, no greater than those encountered when interacting with others in everyday life. For example, if answering certain questions may involve the divulgation of details about your lifestyle or personal views, you can choose to reveal only information that you are comfortable with sharing. Throughout the study and publication process, your confidentiality will be strictly maintained unless you explicitly grant the principal investigator permission to use your likeness in publications and presentations. If you participate in an in-person or online group interview, all participants will be asked not to discuss other's responses outside the group to ensure privacy and confidentiality as stated in item (6) of the "Acceptance of this Form" section below.

Are There Benefits if I Participate?

You and others will indirectly benefit from your participation in that your contributions to this study will be used to improve the design of technological systems intended to help build stronger community ties and support networks. Research results, such as published papers will be made available through the principal investigator, ███████████████████████ and/or ██████████

How Is Information Collected and What Happens to the Information I Provide?

Your confidentiality will be strictly maintained. The only personally identifying information collected will be the net name you choose to be identified under and the email address you give the principal investigator for the purpose of contacting you to schedule an interview. All the data with identifying information collected by the principal investigator will be encrypted with an anonymous participant ID and the encryption code will be stored securely in the password-protected electronic research servers of Simon Fraser University's School of Interactive Arts and Technology (SFU - SIAT). When participatory online focus group discussions are used as a form of interviewing, online information will be exchanged over a secure server located in Canada to ensure that the identities of all participants are kept confidential. If you withdraw, all data will be withdrawn and destroyed as well unless it is data that cannot be withdrawn as it is not connected with you as an individual and that your individual portion of the data cannot be determined.

In the case of an interview conducted in person, the interview may be audio-recorded, videotaped or photographed and later transcribed into written form. The principal investigator will have access to these audio and/or visual recordings, and transcriptions as reference to validate results. In addition, in the interest of extending the boundaries of knowledge and mutual benefits of this research to the stakeholders that have designed, produced and deployed the technologies under study, the audio and/or video recordings of the in-person focus group discussions may be made accessible to these stakeholders if you so authorize it by answering "yes" to question #5. in the "Standard Consent Authorizing the Video Recording of Your Interview" section below.

If you choose to grant the investigators written permission to use your voice and/or likeness in publications and presentations as outlined at the end of this Informed Consent Form but ask to have your confidentiality maintained, these recordings will be electronically manipulated afterwards to mask your voice and/or likeness. After the study has been completed, the principal investigator will securely retain this Informed Consent Form as well as audio-recordings, photographs, videotapes and transcriptions that exist on paper or material support in a locked cabinet located in ▮▮▮▮▮▮▮▮▮ SFU - SIAT locked office for a period of five years and then will be destroyed in November 2020.

Data in digital form — which may include de-identified text, images, and audio — will be encrypted and stored securely in the password-protected electronic research servers of Simon Fraser University's School of Interactive Arts and Technology (SFU - SIAT) in the principal investigator's research account and/or on a password-protected hard drive that is the sole propriety of the principal investigator and that will be kept securely in a locked cabinet located in ▮▮▮▮▮▮▮▮▮ SIAT locked office. This digital data will also be retained for a period of five years and destroyed in November 2020 by permanent removal from the database of the principal investigator's research account and/or of the password-protected hard drive.

Publications and presentations interpreting this data will be produced in the context of academic research. These will primarily present the results in an aggregate form or as caricatures that are composites of one or more participants.

If your data is disclosed and you wish that your image/voice be distorted (if you have answered "yes" to question #2. in the "Standard Consent Authorizing the Video Recording of Your Interview" section below), the investigators will ensure that the selected data does not suggest your identity by obscuring or masking out any information within this data (video, audio, photographs) to ensure that your identity is not revealed. Otherwise and with their explicit consent (if you have answered "no" to question #2. in the "Standard Consent Authorizing the Video Recording of Your Interview" section below), your likeness may be revealed without distortion.

Given that the investigators are using collaborative research methodologies to conduct participatory community-based research by working with different stakeholders involved in the design and public deployment of interactive technologies to improve their design and to generalize these findings to other interactive public space technological artifacts, they are offering you the opportunity to provide an additional contribution to knowledge and mutual benefits in research to their community by making the audio and video recordings of the in-person focus group sessions available to these stakeholders. This use of the audio and video recordings outside the research study component shall require your authorization on a separate release agreement that will be presented to you at the end of the in-person focus group session you participate in.

Standard Consent Authorizing the Video Recording of Your Interview :

1.   Do you wish to be video recorded?

      Yes: ___ No: ___

2.   If you wish to be video recorded, do you wish that your image/voice be distorted?

      Yes: ___ No: ___

3.   Do you permit the use of the video images in future research studies?

      Yes: ___ No: ___

4.   Do you permit the use of your video image in public dissemination (thesis, papers, conference presentations, etc.) directly related to this research project (NOTE: Due to the nature of digital video images, once the video image is disseminated to the public, the researcher does not have any control over how the video images are distributed or used)?

      Yes: ___ No: ___

5.   Do you permit that the audio and video recordings of your interview be subsequently made accessible to the designers and producers of the interactive technology you are interviewed about, in order that they may benefit from your contribution to knowledge?

      Yes: ___ No: ___

Acceptance of this Form:

Your signature on this form indicates that you:

1) understand to your satisfaction the information provided to you about your participation in this research project;

2) understand that you may ask questions for clarification or new information at any time throughout your participation in this study;

3) understand that you may also withdraw your participation at any time and for any reason;

4) understand that in no way does this waive any of your legal rights;

5) understand that by filling out a survey, questionnaire or form other than this Informed Consent Form, you are consenting to participate in this study ;

6) understand that by consenting to participate in an in-person focus group for this study, you confirm that any information you encounter will be kept confidential and not

revealed to parties outside the in-person focus group. Although the objective is to maintain confidentiality, it cannot be guaranteed;

7) understand that the *National Film Board of Canada* and Montreal's *Quartier des Spectacles Partnership* has given the principal investigator permission to conduct this study in collaboration with them ;

8) understand that, should you consent to the videotaping of an in-person focus group session you participate in, you will have the choice to make these video recordings available to the *National Film Board of Canada* and Montreal's *Quartier des Spectacles Partnership* ;

9) agree to be a research participant.

Net name/pseudonym: _____ Email address: _____

Print Name: _____ Date: _____
                                                                     Day / Month / Year

Your Signature : _____

Questions: If you have any questions about this Informed Consent Form, please contact ███████ ████, Doctoral Student, School of Interactive Arts and Technology (SIAT) at ███████████ or ████████████ or ██████████████ Assistant Professor, School of Interactive Arts and Technology (SIAT) at ██████████████ or ██████████ .

Concerns: If you have any concerns about the way you've been treated as a participant or concerns with the research project, please contact ████████████ Associate Director, Office of Research Ethics at ██████████████ or ████████████ .

Appendix D.

Informed Consent for Phase Two (French Version)

Description

This appendix reproduces the French version of the Informed Consent Form used in phase two of this doctoral research project.

Formulaire de consentement éclairé

Titre du projet de recherche:	Étude qualitative sur le terrain de MÉGAPHONE, une installation déployée en espace public incluant deux interfaces d'affichage dynamique de dimension architecturale permettant aux citoyens de s'exprimer librement et de s'engager dans leur communauté en prenant publiquement la parole.
No. du dossier d'évaluation éthique:	[2013s0730]
Chercheure principale:	▉▉▉▉▉▉▉ M.A., Doctorante au School of Interactive Arts & Technology (SIAT), Université Simon Fraser (SFU), Vancouver, C.-B. ▉▉▉▉▉▉▉
Superviseure et co-chercheure:	▉▉▉▉▉▉▉ M.A., Ph.D., Professeure et chercheure à SIAT, Université Simon Fraser (SFU), Vancouver, C.-B. ▉▉▉▉▉▉▉

Le comité d'éthique de la recherche de l'université Simon Fraser a approuvé ce projet de recherche le [date, 2013], et il en assurera le suivi jusqu'à la fin prévue le [date, 2016]. Il est de plus tenu d'approuver toute révision ou modification qui serait apportée à ce formulaire d'information et de consentement ou au protocole de recherche requis.

Ce formulaire de consentement, accessible en ligne et que vous pouvez imprimer, fait partie de la démarche assurant un consentement libre et éclairé. Il vise à vous expliquer les objectifs et les grandes lignes de cette étude, et ce en quoi consisterait votre participation si vous décidiez de participer. Si vous avez besoin de renseignements supplémentaires sur les informations comprises (ou manquantes selon vous) dans ce document, n'hésitez pas à demander des clarifications ou des explications détaillées à la Chercheure principale (CP), ▉▉▉▉▉▉▉, doctorante au School of Interactive Arts & Technology (SIAT) de l'Université Simon Fraser (SFU). Mais avant tout, et surtout avant d'accepter de participer à ce projet de recherche, nous vous demandons de prendre le temps de lire attentivement les renseignements qui suivent afin de bien les comprendre et d'y réfléchir sérieusement.

Buts de la recherche:

Cette étude a pour but de mieux comprendre comment les gens utilisent MÉGAPHONE pour former, entretenir et développer des réseaux sociaux et communautaires. Elle vise également à

analyser leur perception et leur utilisation de cette plateforme technologique *in situ* en milieu urbain. Cette étude a également pour but d'identifier certains aspects cognitifs, physiques, esthétiques, spatiaux et sociaux qui entrent en jeu dans les interactions personne-machine (IPM) en rapport avec cette installation interactive.

Les chercheures utiliseront les données recueillies et analysées dans le contexte de ce projet de recherche, d'une part pour élaborer des cadres théoriques, d'autre part pour rédiger des rapports descriptifs exposant des principes de base, l'ensemble visant à améliorer la conception de MÉGAPHONE ainsi que d'installations interactives semblables déployées en espace public.

Recrutement et sélection des participant(e)s:

Pour être admissible à participer à ce projet de recherche, vous devez être âgé(e) d'au moins 19 ans. Vous devez également vous sentir capable de parler ouvertement de la façon dont vous utilisez les médias sociaux et les technologies de l'information et de la communication (TIC) pour échanger et interagir avec d'autres personnes sur des réseaux sociaux virtuels ou physiques formant différents types de communautés ; il peut s'agir de communautés de savoir et de pratique, de communautés de soutien, de communautés engagées dans des activités de création, et/ou de communautés ayant des intérêts culturels ou politiques.

En quoi consistera votre participation?

Entrevue en personne

Dans le cas d'une entrevue réalisée en personne individuellement ou en groupe, la séance durera de 45 à 90 minutes. Durant celle-ci, la chercheure principale vous posera des questions sur votre perception et votre utilisation des médias sociaux, et aussi des questions sur votre perception, votre utilisation et votre appréciation des technologies de l'information et de la communication (TIC); elle vous demandera notamment d'évaluer l'utilité de ces technologies dans la création de réseaux sociaux, le partage d'information et/ou l'engagement dans des actions collectives.

Échange ou partage d'information en ligne

En cas d'échange ou de partage d'information en ligne, soit par le biais d'un *sondage* en ligne, soit par le biais d'un *groupe de discussion* au sein d'un réseau social privé en ligne, vous pourrez livrer vos commentaires ou répondre à des questions portant sur votre perception et votre utilisation des médias sociaux ainsi que sur les technologies de l'information et de la communication (TIC); vous pourrez également donner votre appréciation des technologies que vous utilisez, notamment votre appréciation de leur utilité dans la création de réseaux sociaux, dans le partage d'information et/ou dans l'engagement dans des actions collectives.

En cas d'échange ou de partage d'information en ligne, que cet échange prenne la forme d'une *participation volontaire à des analyses de géolocalisation*, ou la forme d'une *participation volontaire à des analyses de réseaux*, vous aurez la possibilité de communiquer — pour les périodes de temps limitées durant lesquelles vous vous connectez et vous déconnectez — des informations concernant soit votre position géographique pendant vos déplacements dans le Quartier des spectacles, soit le nombre d'interactions que vous avez avec des interfaces d'affichage dynamique en milieu urbain ou avec d'autres utilisateurs participant à des activités sur ces mêmes interfaces d'affichage dynamique en milieu urbain ; il peut s'agir, par exemple, de jeux vidéo impliquant plusieurs joueurs.

Quelle est la nature de votre participation?

Votre participation est tout à fait libre et volontaire. Si vous acceptez de participer, il est entendu que vous pourrez à tout moment mettre un terme à votre participation, et cela pour quelque raison que ce soit et sans avoir à vous justifier. Cependant, à moins que vous fassiez expressément une demande contraire, les données recueillies jusqu'au moment de votre retrait seront conservées et pourront être utilisées par les chercheures.

Quels sont les risques si je participe?

Votre participation à ce projet de recherche ne devrait vous faire courir *aucun risque* que ce soit, sinon le risque minimal inhérent à toute interaction humaine dans le cadre de la vie quotidienne. Par exemple, si certaines questions risquent de vous amener à révéler vos opinions personnelles ou à donner des détails sur votre mode de vie, vous êtes tout à fait libre de ne donner que les informations que vous vous sentez à l'aise de partager.

Par ailleurs, sachez que pendant toute la durée du projet de recherche et du cycle de publication, votre confidentialité sera respectée à moins que vous n'autorisiez explicitement la chercheure principale à faire usage de votre voix ou de votre image dans des publications et présentations.

Si vous participez à des *entrevues de groupe*, en personne ou en ligne, la chercheure principale demandera à tous les participant(e)s de s'en tenir à la stricte confidentialité vis-à-vis de ce qui aura été échangé en évitant d'en parler à l'extérieur du groupe de discussion, cela afin que la vie privée de chacun soit respectée tel qu'énoncé à l'article (6) de la rubrique « Consentement au formulaire » ci-dessous.

Quels sont les bénéfices potentiels si je participe?

Vous et les autres participant(e)s pourrez retirer un avantage personnel indirect de votre participation en ce sens que vous contribuerez à l'avancement des connaissances dans ce

domaine et que les résultats obtenus seront utilisés pour améliorer la conception des systèmes informatiques voués au développement de réseaux sociaux plus solidaires et offrant davantage de soutien.

Les résultats de la recherche, notamment les publications, seront accessibles par l'entremise de la chercheure principale, soit ███████████████████ et/ou ████████

Comment sont recueillies les données et qu'arrive-t-il aux informations que je fournis?

Votre confidentialité sera strictement respectée. Les seules informations recueillies, qui permettront à la chercheure principale de vous identifier, seront le nom internet que vous choisirez et l'adresse de courriel que vous donnerez à la chercheure principale pour lui permettre de communiquer avec vous afin d'organiser une entrevue. Tous les renseignements recueillis par la chercheure principale permettant de vous identifier seront protégés grâce à un cryptosystème à clé secrète. La clé du code reliant votre nom à votre dossier de recherche sera conservée en toute sécurité dans les serveurs informatiques utilisés aux fins de la recherche au School of Interactive Arts and Technology de l'université Simon Fraser (SFU - SIAT); et elle sera protégée par un mot de passe. Lorsque les entrevues seront effectuées en ligne par le biais d'un groupe de discussion volontaire, le contenu des échanges sera colligé sur un serveur sécurisé situé au Canada permettant que l'identité des participant(e)s demeure confidentielle. Si vous mettez un terme à votre participation, toutes les données recueillies seront également retirées et détruites à moins qu'elles ne puissent être retirées dans le cas échéant où ces données ne sont pas liées à vous en tant qu'individu en particulier et qu'il soit donc impossible de les séparer d'un ensemble.

Dans le cas d'une entrevue réalisée en personne, il est possible que l'entrevue soit enregistrée sur des bandes audio ou vidéo puis retranscrite sous forme écrite, ou que des photographies soient prises. Seule la chercheure principale aura accès à ces enregistrements sur bandes-son ou bandes-vidéo, et à ces transcriptions, le tout étant conservé à des fins de référence dans le but de valider les résultats. De plus, afin de repousser les limites du savoir et d'élargir les bénéfices pour chacune des parties associées au projet de recherche dans le cadre du design, de la production et du déploiement des technologies faisant l'objet de ce projet de recherche, les enregistrements audio ou vidéo des entrevues de groupe réalisées en personne pourraient être mis à la disposition de ces parties si vous y consentez en répondant « oui » à la question 5 de la rubrique « Clauses-standard de consentement à l'enregistrement vidéo de votre entrevue » ci-dessous.

Si vous choisissez de donner aux chercheures l'autorisation écrite d'utiliser votre voix et/ou votre image dans des publications et présentations tel qu'il est décrit à la fin de ce Formulaire de consentement éclairé, mais que vous souhaitez maintenir votre confidentialité, ces enregistrements seront alors traités numériquement de façon à masquer votre voix et/ou votre apparence visuelle. Une fois le projet de recherche terminé, la chercheure principale conservera sous clé ce Formulaire de consentement éclairé ainsi que les enregistrements audio ou vidéo, les

photographies et les transcriptions qui existaient sur support papier ou autre, dans un classeur verrouillé situé dans le bureau verrouillé de ███████████ à SFU - SIAT pour une période de cinq ans suivant la fin du projet. L'ensemble de ce matériel sera détruit en novembre 2020.

Les données sous forme numérique — qui peuvent inclure des textes, des images et des sons anonymisés — seront sauvegardées en toute sécurité, grâce à un cryptosystème à clé secrète, dans le compte d'accès Internet dédié de la chercheure principale sur les serveurs informatiques, eux-mêmes protégés par un mot de passe, utilisés à des fins de recherche au School of Interactive Arts and Technology de l'université Simon Fraser (SFU - SIAT) ; et/ou sur un lecteur de disque dur protégé par un mot de passe qui est la propriété exclusive de la chercheure principale et qui sera conservé dans un classeur verrouillé situé dans le bureau verrouillé de ███████████ à SFU – SIAT. Ces données numériques seront conservées pour une période de cinq ans suivant la fin du projet, après quoi, elles seront supprimées de façon permanente de la base de données de la chercheure principale et/ou du lecteur de disque dur protégé par un mot de passe, cela en novembre 2020.

Les données recueillies dans le cadre de ce projet de recherche seront interprétées pour être publiées dans des publications et présentations destinées à la recherche universitaire. Avant d'être diffusées dans de tels contextes, les données seront agrégées ou modifiées de façon à offrir des portraits composites représentant un(e) ou plusieurs participant(e)s.

Dans le cas où des données pouvant permettre de vous identifier seraient utilisées, et que vous souhaiteriez que votre image/voix soient brouillées (si vous avez répondu « oui » à la question #2 de la rubrique « Clauses-standard de consentement à l'enregistrement vidéo de votre entrevue » ci-dessous), les chercheures s'assureront que les extraits vidéo en question ne suggèrent aucunement votre identité en masquant ou en cachant toute information (vidéo, audio, photos) afin de s'assurer que les données en question n'autorisent pas une telle identification. Par ailleurs, si vous y consentez explicitement (si vous avez répondu « non » à la question #2 de la rubrique « Clauses-standard de consentement à l'enregistrement vidéo de votre entrevue » ci-dessous), votre voix et votre image pourraient être utilisées telles quelles sans être brouillées.

Étant donné que les chercheures ont adopté une méthodologie de recherche menée en collaboration pour poursuivre de la recherche participative communautaire en travaillant avec différents partenaires impliqués dans la conception et le déploiement de technologies interactives visant à améliorer le design et à généraliser les résultats obtenus à d'autres installations interactives déployées en espace public, elles vous offrent l'occasion d'élargir la portée de sa contribution et des bénéfices pour chacune des parties associées au projet de recherche en mettant les enregistrements audio et vidéo des entrevues de groupe réalisées en personne à disposition de ces parties. Cet usage des enregistrements audio et vidéo au-delà de l'étude de ce projet de recherche fera l'objet d'un formulaire de consentement qui vous sera présenté séparément, soit à la toute fin de l'entrevue de groupe à laquelle vous participerez en personne.

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Clauses-standard de consentement à l'enregistrement vidéo de votre entrevue :

1.   Souhaitez-vous être filmé sur support vidéo?

     Oui: ___ Non: ___

2.   Si vous souhaitez être filmé sur support vidéo, souhaitez-vous que votre image et voix soient brouillé)?

     Oui: ___ Non: ___

3.   Acceptez-vous que ces enregistrements vidéo soient utilisé dans d'éventuels travaux de recherche?

     Oui: ___ Non: ___

4.   Autorisez-vous l'utilisation de ces enregistrements vidéo dans des ouvrages diffusés publiquement (thèse, articles, présentation à des conférences, etc.) directement liés à ce projet de recherche (REMARQUE: Étant donné la nature des enregistrements vidéo numériques, une fois que les enregistrements seront diffusés en public, les chercheures n'auront plus le contrôle sur comment les enregistrements seront distribués ou utilisés)?

     Oui: ___ Non: ___

5.   Autorisez-vous que les enregistrements audio et vidéo de votre participation à l'entrevue soit ultérieurement mis à la disposition des designers et producteurs des technologies intéractives dont cette étude fait l'objet, afin qu'ils puissent bénéficier de votre savoir?

     Oui: ___ Non: ___

Consentement au formulaire:

En signant ce formulaire, j'atteste :

1)   Que je comprends de façon satisfaisante les renseignements qui m'ont été fournis sur la nature de ma participation à ce projet de recherche ;

2)   Que, maintenant ou à l'avenir, je comprends que je suis libre de poser des questions ayant pour but de clarifier ces informations ou toute nouvelle information en rapport avec ce projet de recherche ou avec ma participation à ce projet de recherche ;

3)   Que je comprends que j'ai le choix de cesser de participer à ce projet de recherche à n'importe quel moment sans avoir besoin de me justifier ;

4)   Que je comprends qu'en acceptant de participer à ce projet de recherche, je ne renonce à aucun de mes droits ;

5) Que je comprends qu'en remplissant un sondage, un questionnaire ou un formulaire autre que ce Formulaire de consentement éclairé mais relevant également de ce projet de recherche, je consens à participer à ce projet de recherche ;

6) Que je comprends qu'en consentant à participer à une entrevue de groupe réalisée en personne dans le cadre de cette étude, je confirme que toute information échangée lors de cette entrevue de groupe sera tenue confidentielle et ne sera pas divulguée à l'extérieur du groupe. Or, bien que le but soit d'assurer la confidentialité, elle ne peut être garantie ;

7) Que je comprends que l'*Office national du Film du Canada* et le *Partenariat du Quartier des spectacles de Montréal* a donné à la chercheure principale l'autorisation de réaliser ce projet de recherche en collaboration avec eux ;

8) Que je comprends que si je participe à une entrevue de groupe réalisée en personne, j'aurai le choix d'autoriser que ces enregistrements vidéo soient mis à la disposition de l'*Office national du Film du Canada* et du *Partenariat du Quartier des spectacles ;*

9) Que je consens par la présente à participer à ce projet de recherche.

Nom internet/pseudonyme: _____ Adresse courriel: _____

Nom en lettre moulée: _____ Date: _____
                                                                Jour/Mois/Année

Votre signature: _____

Questions: Si vous avez des questions concernant ce formulaire de consentement éclairé, veuillez communiquer avec ███████████████ doctorante au School of Interactive Arts and Technology (SIAT) à : ███████████ ou ██████████████ ; ou encore ████████████████ M.A., Ph.D, Professeure adjointe, School of Interactive Arts and Technology (SIAT) à : ██████████████████ ou █████████.

Commentaires : Si vous avez des commentaires au sujet de vos droits en tant que participant(e) ou au sujet de ce projet de recherche, veuillez communiquer avec ██████████████, Ph.D., Directrice adjointe, Bureau d'éthique de la recherche à: ██████████ ou ██████████

Appendix E.

Recruitment Poster (English Version)

Description

This appendix reproduces the English version of the recruitment poster used in phase one and phase two of this doctoral research project.

English version   (French version overleaf)

Would you like to tell us about your experience of Mégaphone?

I am a doctoral student looking for people to participate in a study on their experience of Mégaphone. Questions would include: How would you describe your experience as a speaker or audience member? How would you like to see Mégaphone used in the future? Would you add or remove features?

The purpose of this study is to improve the design of technology intended to help people build stronger community ties and support interaction in their daily lives.

To be recruited for this study, you must be 19 and over and have the choice to:

1) participate in an in-person focus group made up of about eight to ten participants if you are comfortable sharing details regarding your experience of Mégaphone in front of others;

2) obtain an individual interview if you prefer a one-on-one exchange.

For more information on how to participate in Montréal, contact:

███████████████ doctoral student at Simon Fraser University: ████████████

To our study participants: Individual and focus group interviews will take between 45 to 90 minutes. The information you will share during the individual interview will be audio recorded. Focus group interviews may also be videotaped if I obtain your authorization to do so. This information may then be transcribed into written form for the purpose of analysis.

If you know of others who have experienced Mégaphone and who might be interested in participating in this study, please let them know they can find out more on becoming a participant by contacting me via email at: ████████████

Appendix F.

Recruitment Poster (French Version)

Description

This appendix reproduces the French version of the recruitment poster used in phase one and phase two of this doctoral research project.

version française   (version anglaise au verso)

Que diriez-vous de participer à une étude sur votre expérience de Mégaphone?

Je suis une étudiante au doctorat à la recherche de gens intéressés à participer à une étude sur leur expérience vécue de Mégaphone. Vous répondrez à des questions telles que : Comment décririez-vous votre expérience en tant qu'orateur ou membre du public? Comment voudriez-vous voir Mégaphone être mis à disposition du public à l'avenir? Ajouteriez-vous ou élimineriez-vous quelque chose?

Le but de cette étude est d'améliorer le design des outils technologiques visant à aider les gens à cultiver des liens plus enrichissants dans leurs communautés et à soutenir l'interaction sous toutes ses formes dans la vie de tous les jours.

Pour participer à cette étude, vous devez avoir 19 ans ou plus et vous avez le choix de :

1) participer en personne à l'un de nos « focus groups » si vous êtes à l'aise de partager des détails sur votre expérience de Mégaphone autour d'une table avec 8 à 10 personnes;

2) participer en m'accordant une entrevue individuelle si vous préférez la confidentialité.

Pour plus d'informations sur comment participer à cette étude qui a lieu à Montréal, veuillez communiquer avec:

███████████, étudiante au doctorat à l'université Simon Fraser : ███████████

À tous ceux qui souhaitent participer à cette étude: Les entrevues individuelles et les entrevues de groupes seront d'une durée de 45 à 90 minutes. Lors d'une entrevue individuelle, vos propos seront enregistrés sur support audio. Si j'obtiens votre autorisation écrite, les entrevues de groupe pourraient également être enregistrées sur support vidéo. Vos propos seront ensuite transcrits sous forme de texte écrit sur support papier pour en faciliter l'analyse.

Si vous connaissez d'autres personnes qui ont fait l'expérience de Mégaphone et qui seraient potentiellement intéressés à participer à cette étude, n'hésitez pas à leur dire qu'ils peuvent en savoir plus en communiquant avec moi à l'adresse courriel suivante : ███████████

Appendix G.

Research Instrument

Description

This appendix reproduces the research instrument used in phase one and phase two of this doctoral research project.

Sample of the Semi-Structured Interview Questions Intended For All Modes of Participation (all methods of data collection)

The following are some of the possible preliminary questions that will be used in the semi-structured and unstructured interviews conducted individually, as well as in in-person focus group interviews, in participatory online focus group discussion and in online surveys. Note these questions are the same questions used for all methods of data collection and that interviews using these questions may be audiotaped and/or videotaped. Additional questions may derive from these preliminary questions if the study participant's answer(s) leads to more detailed inquiries or if the study participant's wishes to pursue a given line of inquiry. The objective of these questions is to collect data on how participants use social media and digital ICTs to form community networks, as well as engage in collective action and information sharing.

List of Possible Questions:

A. Access and autonomy of use

1. Do you own a personal home computer or laptop? If so, what do you mainly use it for?

2. Do you have access to a high-speed internet connection at home?

3. Do you own a personal portable ICT such as a mobile cell phone, a smart phone and/or a tablet? If so, what do you mainly use it/them for?

4. If you use a personal portable ICT, do you subscribe to internet Wi-Fi access? How often do you have it?

5. Do you regularly access a high-speed internet or Wi-Fi connection outside your home? If yes, where?

6. What is your preferred mode of communication for exchanging with close friends or family?

7. If you use a personal portable ICT, do you use SMS (text messaging)? If so, how frequently?

8. When you use a portable ICT, how long are your exchanges on average?

9. Within the circle of your close friends and family, what percentage would you say own or have access to the following: personal computer or laptop? mobile cell phone? smart phone? tablet? internet access at home? Wi-fi?

10. Within the circle of your extended network of friends and the members of your community, what percentage would you say own or have access to the following: personal computer or laptop? mobile cell phone? smart phone? tablet? internet access at home? Wi-fi?

B. Social media

1. Do you use social media? If so, which social media sites do you use? Out of these, which social media sites do you prefer? Why?

2. With what ICT do you use social media?

3. Where are you physically when you use social media?

4. How many hours a week do you spend on social media?

5. What do you most use social media for? Instant messaging (IM)? Email? Sharing photos? Sharing weblinks? Sharing web content? Sharing video?

6. How often do you use social media to communicate in real time (for instance, IM)?

7. What language do you communicate in when you use social media?

9. What kind of content do you like to upload or download in social media: text, images, sound, video? Personal pictures? Content authored by you?

10. How large is your social media community?

11. Do you have sub-groups in your social media community such as "List of Friends" features?

12. Do you use your real identity or an avatar to present yourself on social media?

13. Do you use more than one identity in social media?

14. What kinds of privacy settings do you choose when you use social media?

15. What is your main privacy concern online?

16. When you use social media, are you concerned about employment risk or being stigmatized?

17. When you use social media, who do you respond to most frequently?

18. When you use social media, who responds to you most frequently?

19. Would you say social media has helped you develop new meaningful relationships?

20. Would you say social media has helped you strengthen existing ties?

C. Social networks, community networks and community-building

1. Describe how you developed your offline social network?

2. Describe how you developed your online social network?

3. Among the people you regularly exchange with using ICTs and/or social media, how many would you say are close family? Extended family? Close friends? Casual friends? Neighbours? Members of your community?

4. Describe how you use online social media to organize your social networks?

5. Describe the relationship(s) between your online and offline social network?

6. Were their factors that enabled or prevented you from developing these networks?

7. Are there social networks or community networks that you feel excluded from? If so, why?

8. What types of social networks or community networks are most prevalent in your life?

9. Do you engage in online exchanges with people outside your local (geophysical) community?

10. Are certain groups excluded from these online social networks or community networks?

D. Collaborative uses of ICTs and social media

1. Do you use recommendations made by friends in your online social media group?

2. Do you play collaborative games online?

3. Have you ever used ICTs and/or social media to produce knowledge collectively (for instance, with a wiki)?

4. Have you ever used ICTs and/or social media to organize collective events or activities?

5. Do you believe social networks or community networks could improve your life? If so, how?

6. Have you ever used social networks or community networks to ask for help when you are facing problems or difficulties? If yes, in what ways?

7. Drawing on your first-hand experience and observations, do you believe that social networks or community network can provide help and support to people in need?

8. Do you believe that online social networks and community networks increase people's opportunities to do things collaboratively?

9. In your view, are there forms of collaboration that are specific to the features of ICTs and social media (and that could not exist offline)?

10. Do you believe that online collaboration can lead to social change offline? If so, how?

E. Use of an interactive public space installation that includes one or more media façade(s)

1. Describe your experience of the interactive public space installation if and when you used it?

2. Describe your experience of the interactive public space installation if and when you observed other people using it?

3. How would you want to appropriate (use) the interactive public space installation if you had the opportunity to do so?

4. What features of the system would best support this or these different form(s) of appropriation?

5. What added value do you think the media façades bring to the interactive public space installation?

6. Do you think the interactive public space installation could be designed as effectively without its monumental media façades? If so, how?

7. What type of engagement do you think this interactive public space installation space affords?

8. How would you say the interactive public space installation reconfigures the plaza as a public space?

9. Does the interactive public space installation enable new or better forms of community exchanges?

10. How do you feel the interactive public space installation benefits the local community?

11. How do you think the design of the interactive public space installation could be improved to foster a greater sense of community and participatory culture.

12. How do you feel the interactive public space installation benefits non-residents that accidentally come across it as pedestrians, cyclists or motorists?

13. Do you think the bright and high visibility of the interactive public space installation could be hazardous to traffic or cause accidents? If so, how could this be prevented?

14. What do you think of the ambient lighting conditions around the interactive public space installation?

15. Would you change anything in how traffic (pedestrians, bicycles, buses, cars/motorcycles) circulates around the interactive public space installation?

16. Do you feel that the interactive public space installation is accessible to all? If not, which individual(s) or group(s) are excluded?

17. Would you want to see the interactive public space installation as a permanent municipal infrastructure or do you think it should only be deployed occasionally? If so, when and how often?

18. How would you like to see the interactive public space installation used in the future?

19. What features would you add to this interactive public space installation?

20. What features would you eliminate to this interactive public space installation?

Appendix H.

Demographic Survey (English version)

Description

This appendix reproduces the English version of the two-page demographic survey used in phase two of this doctoral research project.

Name:

1.   Gender   Male _____   Female _____

2.   Age range   19-25 yrs old _____

                         26-30 yrs-old _____

                         31-40 yrs-old _____

                         41-50 yrs-old _____

                         51-60 yrs-old _____

`   61-70 yrs-old _____

                         71 yrs-old + _____

3.   Occupation ?   _____

4.   What is the highest level of education you completed?

                         elementary school _____

                         high school _____

                         college or technical school certificate or degree _____

                         university bachelor's degree _____

                         some postgraduate training _____

                         master's or doctoral degree _____

5.   While we all think of ourselves as Canadians, please indicate what other background or nationality you
        feel is a part of your identity as pertains to your ancestors?

                         _____

6. How often you use the following media or services:

Television: _____

Radio: _____

Twitter: _____

Social Networks: _____

Virtual Worlds: _____

Digital Games: _____

Internet (web browsing):   _____

E-mail: _____

Texting: _____

Blog   _____

> **Scale to rate questions 6 and 7**
>
> **1 – Never** (You have never used this type of device or service before)
>
> **2 – Rarely** (You have used this type of device or service once or twice, but not with any regularity)
>
> **3 – Occasionally** (You use this device or service, but no more than once a month)
>
> **4 – Regularly** (You use this type of device or service for specific tasks, no more than once a week)
>
> **5 – Frequently** (You use this device or service several times a week)
>
> **6 – Very Frequently** (You use this device or service at least once a day, most days)
>
> **7 – Constantly** (You use this device or service multiple times a day, every day.)

7. How often you use the following technologies:

Smart Phone: _____

Tablet PC: _____

E-Book Reader: _____

Home Gaming Console: _____

Personal Computer: _____

Other technology: _____   Describe:_____

8. Before using Megaphone, had you ever publicly spoken in a public space before? Briefly describe.

9. Before using Megaphone, had you ever interacted w/ large digital displays or media façades? Briefly describe.

10. Before using Megaphone, had you ever interacted with speech recognition software? Briefly describe.

Appendix I.

Demographic Survey (French Version)

Description

This appendix reproduces the French version of the two-page demographic survey used in phase two of this doctoral research project.

Nom:

1.   Sexe?   homme _____   femme _____

2.   Dans quelle tranche d'âge vous situez-vous?   19-25 ans _____

                                                         26-30 ans _____

                                                         31-40 ans _____

                                                         41-50 ans _____

                                                         51-60 ans _____

`   61-70 ans _____

                                                         71 ans + _____

3.   Quelle est votre activité principale?   _____

4.   Quel est votre degré de formation?

                        école primaire _____

                        école secondaire _____

                        certificat ou diplôme technique ou collégial/CEGEP_____

                        diplôme universitaire de premier cycle _____

                        études universitaires de deuxième / troisième cycle _____

                        diplôme(s) universitaire(s) de deuxième / troisième cycle _____

5.   Mise à part votre citoyenneté, veuillez indiquer la ou les communauté(s) ethnique(s)/culturelle(s) avec
      laquelle ou lesquelles vous souhaitez vous identifier en rapport avec votre identité et/ou celle de vos
      ancêtres?

                        _____

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6. À quelle fréquence utilisez-vous les médias et services suivants:

télévision:	_____
radio:	_____
twitter:	_____
réseaux sociaux:	_____
environnements virtuels:	_____
jeux numériques:	_____
internet (recherche web):	_____
courriel:	_____
textage :	_____
blogue	_____

> *Échelle de fréquence pour les questions 6 et 7*
>
> *1 – Jamais (vous n'avez jamais utilisé ce service ou ce dispositif)*
>
> *2 – Rarement (vous avez utilisé ce service ou ce dispositif une ou deux fois seulement, mais jamais de façon régulière)*
>
> *3 – De temps en temps (vous utilisez ce service ou dispositif moins d'une fois par mois)*
>
> *4 – De façon régulière (vous utilisez ce service ou dispositif pour des tâches spécifiques moins d'une fois par semaine)*
>
> *5 – Souvent (vous utilisez ce service ou ce dispositif plusieurs fois par semaine)*
>
> *6 – Très souvent (vous utilisez ce service ou dispositif environ une fois par jour)*
>
> *7 – Toujours (vous utilisez ce service ou ce dispositif plusieurs fois par jour, chaque jour)*

7. À quelle fréquence utilisez-vous les dispositifs suivants:

téléphone intelligent:	_____
tablette électronique:	_____
livre électronique:	_____
console de jeu vidéo:	_____
ordinateur personnel:	_____
autres dispositifs:	_____ décrivez :_____

8. Avant votre expérience du Mégaphone, aviez-vous déjà parlé dans une tribune en espace public? Décrivez brièvement quand et comment?

9. Avant votre expérience du Mégaphone, aviez-vous déjà interagi avec une façade médiatique de dimension architecturale ou un écran numérique de grand format? Décrivez brièvement quand et comment?

10. Avant votre expérience du Mégaphone, aviez-vous déjà interagi avec un dispositif de reconnaissance de la parole? Décrivez brièvement quand et comment?

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Appendix J.

Interviews

Description

This appendix lists the semi-structured interviews that were conducted with digital media artists, experts and study participants during Phase One and Phase Two of this research. The names of study participants have been redacted to protect their identity, except for those who specifically asked that their name or their pseudonym be made public in this study and all publications derived from this field study on public interaction.

Interviews with experts, artists and study participants (Phase One and Phase Two)

Interviewee i.d.	Code	Date	First Name	Last Name	Interview
ExpertPhaseOne1	[E1]	November 20, 2012	Pascal	Lefebvre	individual
ExpertPhaseOne2	[E2]	March 26, 2013	Phillipe	Jetté	individual
Artist1PhaseOne	[A1]	April 5, 2013	Herman	Kolgen	individual
Artist2PhaseOne	[A2]	April 18, 2013	Jean	Dubois	individual
ExpertPhaseOne3	[E3]	May 7, 2013	Pierre	Fortin	individual
ExpertPhaseOne4	[E4]	January 28, 2014	Scott	McQuire	individual
ExpertPhaseOne5	[E5]	April 4, 2014	[redacted]	[redacted]	individual
ParticipantPhaseTwo1	[P1]	November 6, 2013	[redacted]	[redacted]	focus #1
ParticipantPhaseTwo2	[P2]	November 6, 2013	[redacted]	[redacted]	focus #1
ParticipantPhaseTwo3	[P3]	November 6, 2013	[redacted]	[redacted]	focus #1
ParticipantPhaseTwo4	[P4]	November 6, 2013	[redacted]	[redacted]	focus #1
ParticipantPhaseTwo5	[P5]	November 12, 2013	[redacted]	[redacted]	focus #2
ParticipantPhaseTwo6	[P6]	November 12, 2013	[redacted]	[redacted]	focus #2
ParticipantPhaseTwo7	[P7]	November 14, 2013	[redacted]	[redacted]	individual
ParticipantPhaseTwo8	[P8]	November 16, 2013	[redacted]	[redacted]	focus #3
ParticipantPhaseTwo9	[P9]	November 16, 2013	[redacted]	[redacted]	focus #3
ParticipantPhaseTwo10	[P10]	November 16, 2013	[redacted]	[redacted]	focus #3
ParticipantPhaseTwo11	[P11]	November 21, 2013	[redacted]	[redacted]	individual
ParticipantPhaseTwo12	[P12]	November 27, 2013	[redacted]	[redacted]	individual
ParticipantPhaseTwo13	[P13]	November 28, 2013	[redacted]	[redacted]	individual
ParticipantPhaseTwo14	[P14]	December 27, 2013	Brigitte	Dajczer	individual
ParticipantPhaseTwo15	[P15]	January 8, 2014	Anarchopanda	*(pseudonym)*	individual
ParticipantPhaseTwo16	[P16]	January 9, 2014	[redacted]		individual
ParticipantPhaseTwo17	[P17]	January 14, 2014	Simon	Lussier	individual
ParticipantPhaseTwo18	[P18]	January 15, 2014	Jean-François	Nadeau	individual
ParticipantPhaseTwo19	[P19]	January 19, 2014	[redacted]	[redacted]	individual
ParticipantPhaseTwo20	[P20]	January 20, 2014	Serge	Lavoie	focus #4
ParticipantPhaseTwo21	[P21]	January 20, 2014	Didier	Berry	focus #4
ParticipantPhaseTwo22	[P22]	January 16, 2014	[redacted]	[redacted]	individual
ExpertPhaseTwo1	[E7]	August 26, 2013	Étienne	Paquette	individual
ExpertPhaseTwo2	[E8]	December 9, 2013	Frederic	Osterath	focus #5
ExpertPhaseTwo3	[E9]	December 9, 2013	Gilles	Boulliane	focus #5
ExpertPhaseTwo4	[E10]	January 9, 2014	Mikaël	Charpin	individual
ExpertPhaseTwo5	[E11]	January 15, 2014	Louis-René	Beaudin	individual
ExpertPhaseTwo6	[E12]	September 13, 2013	Alexandre	Lupien	individual
ExpertPhaseTwo6	[E12]	July 31, 2014	Alexandre	Lupien	individual
ExpertPhaseTwo6	[E12]	August 7, 2014	Alexandre	Lupien	individual
ExpertPhaseTwo6	[E12]	August 14, 2014	Alexandre	Lupien	individual
ExpertPhaseTwo6	[E12]	September 4, 2014	Alexandre	Lupien	individual

Appendix K.

List of Collaborative Outputs

Description

This appendix lists all the publications and creative outputs that were undertaken or presented in collaboration with stakeholders in local, national and international conference venues during phase one, phase two and phase three of this doctoral research project.

VIDEO

(NFB-produced montage of field video research outcome, including an interview)

National Film Board of Canada. (2013). "The Best of" Mégaphone [Video file]. Montréal, Canada: National Film Board of Canada. Retrieved from https://vimeo.com/80826567

ACADEMIC PUBLICATIONS

(article written in collaboration with producer of NFB Interactive Montréal Studio)

Fortin, C., Hennessy, K., & Sweeney, H. (2014a). Roles of an interactive media façade in a digital agora. Proceedings of PerDis'14: *Third ACM Conference of the International Symposium on Pervasive Displays* (June 4-5, 2014, Copenhagen, Denmark). In S. Gehring (Ed.), New York, NY, ACM Press, 7-12. doi:10.1145/2611009.2611029

(additional two-page technical poster and supplementary video)

Fortin, C., Hennessy, K., & Sweeney, H. (2014b). The "Making of" Mégaphone, an interactive "Speakers' Corner" and digitally-augmented agora in public space. Proceedings of PerDis'14: *Third ACM Conference of the International Symposium on Pervasive Displays* (June 4-5, 2014, Copenhagen, Denmark). In S. Gehring (Ed.), New York, NY, ACM Press, 110-111. doi:10.1145/2611009.2617198   Retrieved from https://vimeo.com/73946050

ACADEMIC PUBLICATIONS (Cont'd)

(article written in collaboration with stakeholders at the Quartier des Spectacles)

Fortin, C., Hennessy, K., Baur, R., & Fortin, P. (2013a). Beyond the vision paradigm: Design strategies for crossmodal interaction with dynamic digital displays. Proceedings of PerDis'13: *Second ACM Conference of the International Symposium on Pervasive Displays* (June 4-5, 2013, Google Inc., Mountain View, California). New York, NY, ACM Press, 91-96. doi:10.1145/2491568.2491588

(additional two-page technical poster and supplementary video)

Fortin, C., Hennessy, K., Baur, R., & Fortin, P. (2013b). The Quartier des Spectacles: Developing the interactive potential of dynamic digital displays in actual public space. Proceedings of PerDis'13: *Second ACM Conference of the International Symposium on Pervasive Displays* (June 4-5, 2013, Google Inc., Mountain View, California). New York, NY, ACM Press, 2 pages. Retrieved from https://www.youtube.com/watch?v=duoV6kieUBs

(article written in collaboration with a technology designer from Moment Factory)

Fortin, C., Lupien, A., & Hennessy, K. (2014). Learning from the Mégaphone: Design principles for interactive public space digital installations. Proceeding of ISEA'14: *20th International Symposium for Electronic Arts 2014* (October 30-November 8, 2014, Dubai, UAE).

(article for which Moment Factory contributed photos and video supplementary material)

Fortin, C., & Hennessy, K. (2015). The dual skins of a media façade: Explicit and implicit interactions. *Leonardo, 48*(4), 348-356. doi:10.1162/LEON_a_01088

(video supplementary material contributed to Leonardo electronic supplements)

Moment Factory. (2013). Mégaphone [Video file]. Montréal, Canada: Moment Factory. Retrieved from http://www.momentfactory.com/en/project/street/Megaphone/_/_/_

Appendix L.

Description of Mégaphone's System Architecture

Description

This appendix provides a technical description of Mégaphone's system architecture by explaining how key components work and relating them to one another.

Mégaphone's System Architecture

Mégaphone's system architecture consists of a client-server infrastructure that connects the digital output interfaces – namely eight loudspeaker units, nine projectors and four stage lights – to the Shure microphone through five servers labelled **LINUX01**, **LINUX02**, **PC04**, **PC03** and **PC05**. Stored onsite inside the master control booth, these five servers ran the different system modules, which included:

- 1x fast, low accuracy English speech recognition software for the small façade;

- 1x fast, low accuracy French speech recognition software for the small façade;

- 1x slow, high accuracy French speech recognition software for the large façade;

- 1x slow, high accuracy English speech recognition software for the large façade;

- 1x Max MSP™ audio patch for audio analysis;

- 3x Node.js™ platforms each assigned to the stage lights and the two media façades;

- 1x MySQL™ database;

- 2x distinct Touch Designer™ generative visuals software (one for each façade);

- 1x VYV Photon™ videomapping software linked to the video servers;

- 1x grandMA2™ lighting console software.

How Mégaphone Works?

Once the microphone has captured sound input, **Server PC04** back-end receives it to split it into two signals. Directly sent into a digital sound console for output through the eight loudspeaker units, the first signal is mostly processed for audio amplification. The second signal is immediately sent to the Max MSP™ audio patch for analysis: while the Touch Designer™ software on **Server PC04** extracts parameters to generate the visual data sent to the single Christie™ projector that illuminates the small media façade, the rest of the data analyzed by the audio patch outputs to the four other servers.

Server LINUX01 can operate the two different speech recognition modules that were custom-programmed by CRIM: the one assigned to the small media façade runs in English and the one assigned to the monumental façade runs in French. **Server LINUX02** runs the two other speech recognition modules: here, the order is inverted with the one assigned to the small media façade running in French and the one assigned to the monumental façade running in English. Consequently, the selected language determines which one module will transcribe on each of these two servers. Once the speech has been analyzed by these modules, the transcriptions are then sent back to **Server PC04** to be processed for display on the two media façades.

The Touch Designer™ generative visuals software on **Server PC04** creates data visualizations for immediate display on the small media façade. Its speech recognition modules are fast enough to transcribe words in real time, but their efficiency rate is low at 30% to 50% accuracy.

By contrast, the transcriptions for the monumental media façade have a slightly more convoluted path and a twenty second delay, but they also have a higher efficiency rate with 70% to 80% accuracy. CRIM scientists remarked that this efficiency rate could be further increased if the speech recognition software had been programmed to compare utterances drawn from a spoken word context instead of the printed word lexicon that was sourced online because the former does not yet exist; ultimately, if the software's lexicon is a very similar source, one can expect the accuracy to be closer to 100% (G. Boulianne, interview, 9 December 2013,~12min). Once the Node.js™ platform on **server PC04** has back end received the transcriptions from the module on servers **LINUX01** or **LINUX02**, words gets inscribed into a MySQL™ database used to create an archival repository of the most recently spoken and frequently recurring words, and also sent to **server PC03** to be processed for display on the monumental façade.

The Touch Designer™ generative visuals software on **Server PC03** combines these transcriptions with voice parameters extracted from the audio patch in **Server PC04** to prepare the final graphic layout that will be projected onto the monumental façade by the eight Christie™ projectors doubled up to cover four abutting sections. Finally, **Server PC05** receives a signal from the audio patch when the system switches from one mode to another in order to control the stage lighting.

Appendix M.

Figures

Description

This appendix contains all the figures referenced in chapters of this doctoral dissertation.
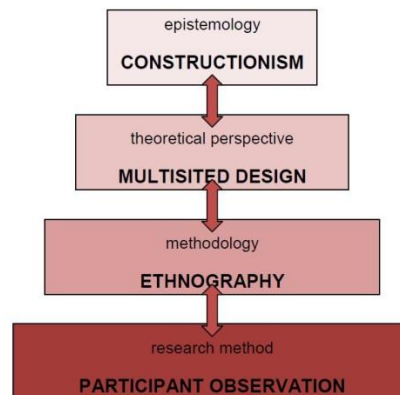
List of Figures

Chapter 2.

Methodological Approach

Figure 2.1   Example of a scaffolded research model

Illustrates the relationship between the epistemological paradigm, the theoretical perspective, the methodology and the research method(s) that provide the foundation of the research design (adapted and derived from Crotty, 1998, p. 4, 6).

Figure 2.2   Scaffolded research model of this doctoral research project

Model describing under what set of assumptions design knowledge was produced in this dissertation (adapted and derived from Crotty, 1998, p. 4).
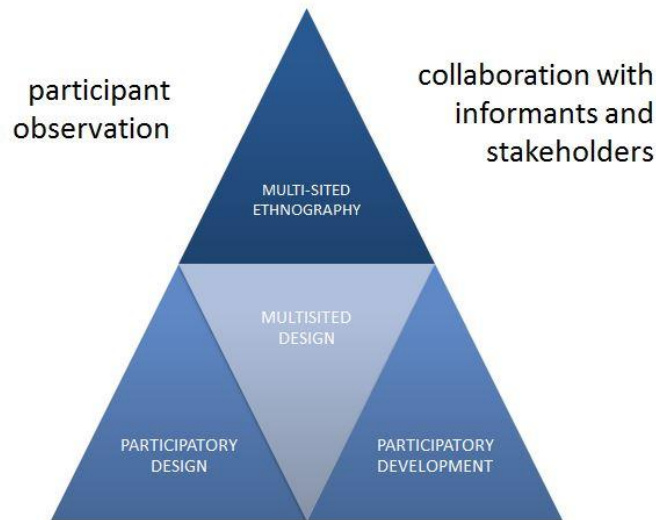
Figure 2.3 **Diagram illustrating the roots of multisited design**

Pyramid model illustrating the relationship between multi-sited ethnography, participatory design and participatory development as the three pillar approaches forming the foundations of multisited design (adapted and derived from Williams, Lindtner, Anderson, & Dourish, 2014, pp. 80-83).

variations in the scope of the observations throughout the research process				
STAGE	PHASE ONE	PHASE TWO - part 1	PHASE TWO - part 2	ANALYSIS PHASE
dissertation	chapter three	chapter four	chapters five and six	all chapters
research focus	exploration and immersion in core site	meeting and observing expert stakeholders	meeting and observing end user stakeholders	describing, interpreting, synthesizing and reporting
emphasis	descriptive observations (interactive displays)	focused observations (design and production)	selective observations (research design)	ethnographic text
principal activities	- exploring and scoping the field - interviewing - collecting primary source material - writing up reports used to create a feedback loop that leads to phase two	- building relationships w/ expert stakeholders - interviewing - attending production meetings, onsite testing and events - producing reports in collaboration w/ experts stakeholders	- immersion in 37-day deployment w/ end users - interviewing - onsite field documentation - producing reports in collaboration w/ all stakeholders	- cataloguing of documentation - data interpretation - in-depth analysis - reflecting on fieldwork - producing reports in collaboration w/ all stakeholders
project begins	May 2012 ⟹	April 2013 ⟹	September 2013 ⟹	August 2014 ⟹ August 2015

Figure 2.4 **Descriptive timeline of this doctoral research project**

Chart that marks the different phases of the participant observation process undertaken in this doctoral research project (adapted and derived from Spradley, 1980, pp. 33-34).

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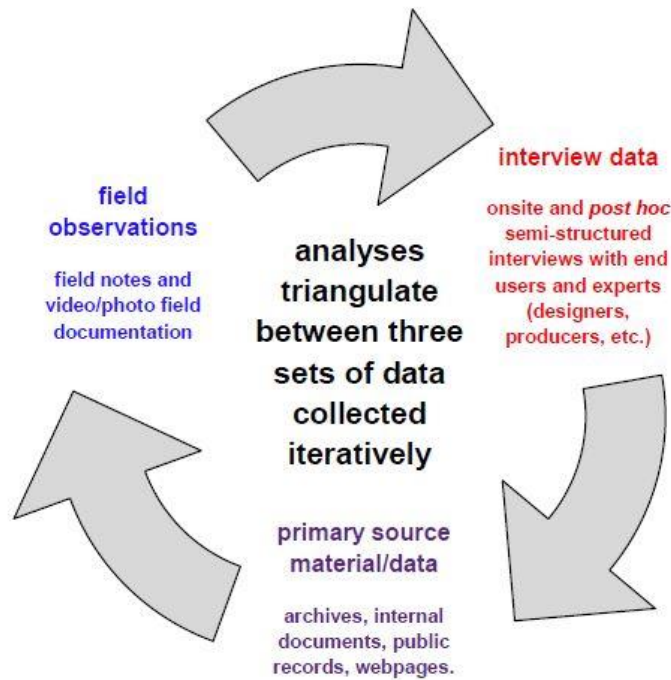
Figure 2.5   Diagram showing the iterative cycle of data collection/analyses

This cycle was a continuum that spanned across the different phases of this doctoral research project shown in Figure 2.4. Data analysis consisted in triangulating between these three sets of data to arrive at a more holistic interpretation.

DIGITAL AND PHYSICAL PARTICIPATIVE ART ACCORDING TO OCUBO				
physical participation	participation through an object	participation without an interface	participation with an interface	delayed or deferred participation
people participate by manipulating their own media or materials (drawing, painting, etc.).	people participate through a non-digital object customized for the installation space.	people participate with their body, their movements and with their physical presence.	people participate through an interactive digital object, screen or tangible surface.	people participate before the deployment via a recording or their virtual presence.

Figure 2.6   Design framework for participative art

The five forms of participation in digital and physical interactive artwork according to OCUBO. (adapted and derived from Purnelle, 2015, internal powerpoint presentation)

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degree of interactivity by level of engagement	name of role played by user construed as actor	action performed with interactive public space technological artifact (digital displays)
level 7	meta-designer	one who (re)designs public space technology environments that can be modified by others
level 6	designer	one who organizes content in displays
level 5	collaborator	one who communicates with others
level 4	content contributor	one who uploads content on displays
level 3	active observer	one who actively searches for content
level 2	engaged observer	one who consumes content on displays
level 1	unengaged observer	one who observes displays from afar
level 0	uninvolved actors	one inattentive or unaware of displays

Figure 2.7 *Public Interaction Framework* **for this doctoral research project**

Conceptualized and customized for this doctoral research project to be applied to dynamic digital display systems and media façades deployed in real urban settings. The eight operational concepts take into account that participation is expressed as different levels of engagement defined through a type of action, which is categorized as a role played by the interactant. (adapted and derived from Preece & Shneiderman (2009), Fischer (2011) and OCUBO's framework shown in Figure 2.6).

Chapter 3.

New Interfaces in an Urban Digital Laboratory

Figure 3.1   Five of the red spotlight walkways in the *Luminous Pathway*

The first strategy of the Quartier des Spectacles' *plan lumière* was to brand the entire district with a single, recognizable red lighting signature that paves the way to each individual cultural venue. Quartier des Spectacles district, Montréal, 2006.

Concept/design: Axel Morgenthaler (Phototonic Dreams)
Ruedi Baur & Jean Beaudoin (Intégral)

far left image: Édifice 2-22 and Club Soda
© 2012 by Martine Doyon. Reprinted with permission.

center left image: Théâtre du Nouveau Monde
© 2006 by Martine Doyon. Reprinted with permission.

center image: Théâtre du Nouveau Monde
© 2010 by Martine Doyon. Reprinted with permission.

center right image: Cinérobothèque de l'ONF
© 2010 by Martine Doyon. Reprinted with permission.

far right image: Théâtre Telus
© 2010 by Martine Doyon. Reprinted with permission.

Figure 3.2   Three façades of buildings permanently lit by architectural lighting

The second strategy of the Quartier des Spectacles' *plan lumière* was to use architectural lighting to personalize, decorate and enhance the visual identity of the façades of cultural venues. Quartier des Spectacles district, Montréal, 2006.

Concept/design: Axel Morgenthaler (Phototonic Dreams) and
                     Ruedi Baur & Jean Beaudoin (Intégral)

left image   Monument-National. Architectural lighting by Phototonic Dreams.
                     © 2010 by Martine Doyon. Reprinted with permission.

center image   Théâtre du Gésù. Architectural lighting by LumiVision et Les Éclairages Lou.
                     © 2010 by Martine Doyon. Reprinted with permission.

right image   Cinémathèque québécoise. Architectural lighting by Lightemotion.
                     © 2010 by Martine Doyon. Reprinted with permission.

Figure 3.3   Different views of the *Intersections Signalétiques* digital crosswalk

The third strategy of the Quartier des Spectacles' *plan lumière* was to use dynamic lighting to point to cultural events in real time within the Quartier des Spectacles district, Montréal, 2010.

Concept: Ruedi Baur & Jean Beaudoin (Intégral)
Implementation: André Langevin (Les idées lumière)

left image   © 2010 by Martine Doyon. Reprinted with permission.

center image   © 2010 by Mikaël Charpin. Reprinted with permission.

*right image*   © 2010 by Martine Doyon. Reprinted with permission.
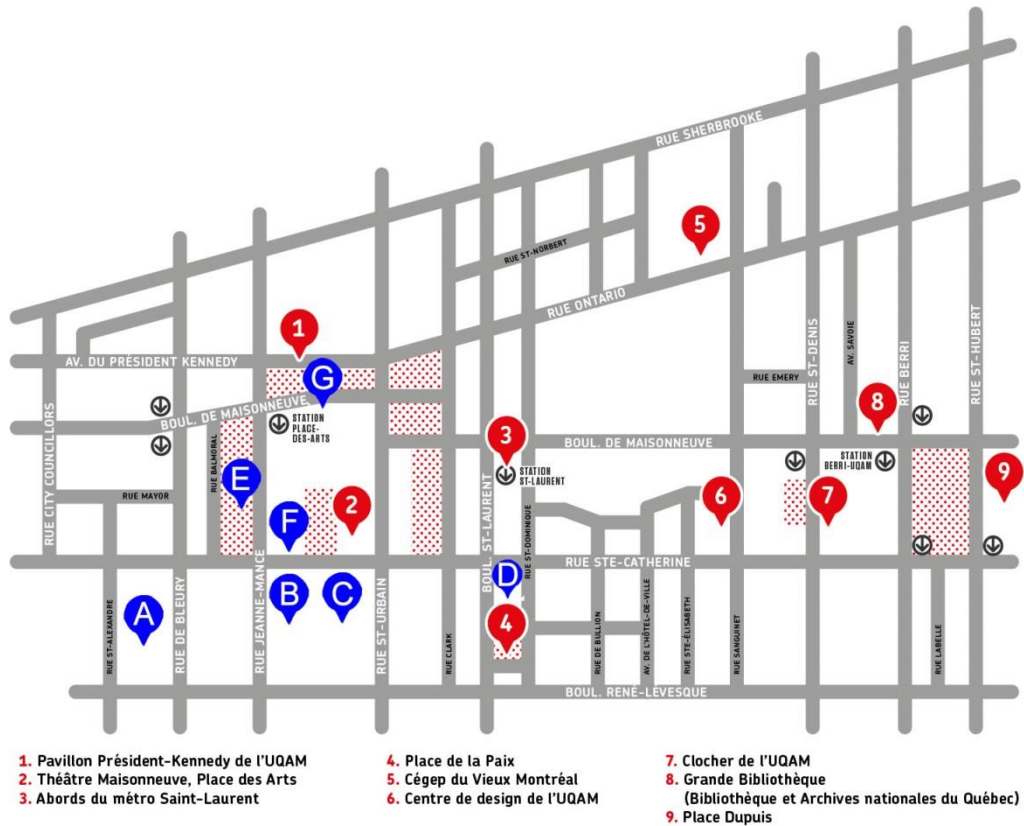
Figure 3.4   Location of media façades in the Quartier des Spectacles

Blue placemarker icons indicate temporary interactive display digital art deployments and red placemarker icons mark the location of the nine permanent media façades.
Quartier des Spectacles district, Montréal, 2013.
Image credit: © 2013 by Quartier des Spectacles. Modified and reprinted with permission.
Source: (Internet) URL: http://www.quartierdesspectacles.com/static/img/pathway/
                        pathway3/qds_map_vf_carte-parcours-videoprojection-actuel_fr.png
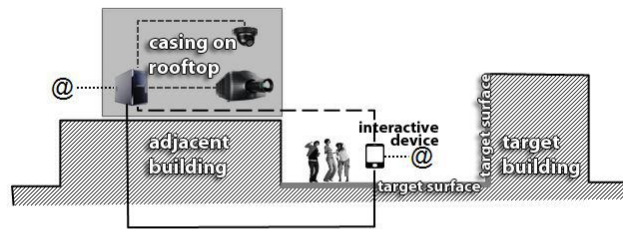
Figure 3.5   Basic model used to provide interactivity on the entire site

Quartier des Spectacles district, Montréal, 2014.
Image credit: © 2014 by Mikaël Charpin. Reprinted with permission.
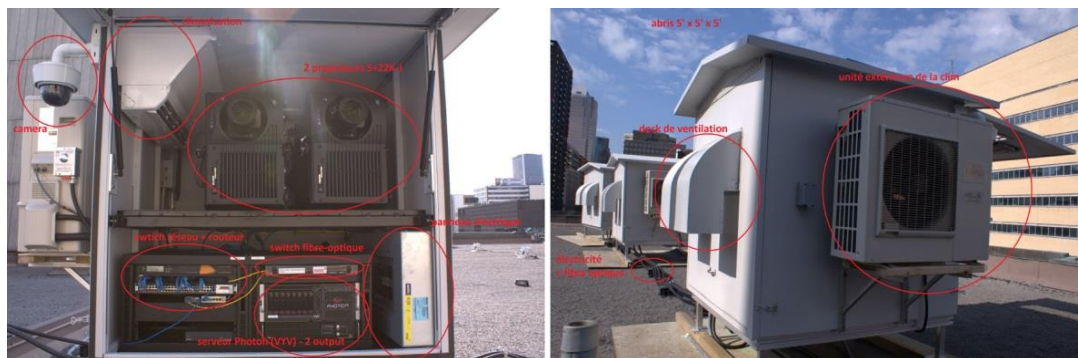
Figure 3.6   Weather-proof metal casings used to store projection equipment

Metal casings placed on rooftops, 5' x 5' x 5', Quartier des Spectacles district, Montréal, 2012.

left photo: · red circle on upper left side corner indicates the surveillance camera;
                          · red circle to its right indicates the HVAC heating and cooling system;
                          · large oval circle in upper half indicates doubled Christie™ videoprojectors;
                          · red oval on lower left side indicates the switcher for network connection;
                          · red oval to its right (top) indicates switcher for fiber-optics connection;
                          · red oval to its right (bottom) indicates the Photon™ servers and 2 outputs;
                          · red oval on lower right hand side indicates the electric power supply;

right photo: · small red oval on lower left side indicates the electric and fiber-optics cable;
                          · large red oval on left hand side indicates the ventilation dock;
                          · red oval on the right hand side indicates HVAC heating and cooling system.

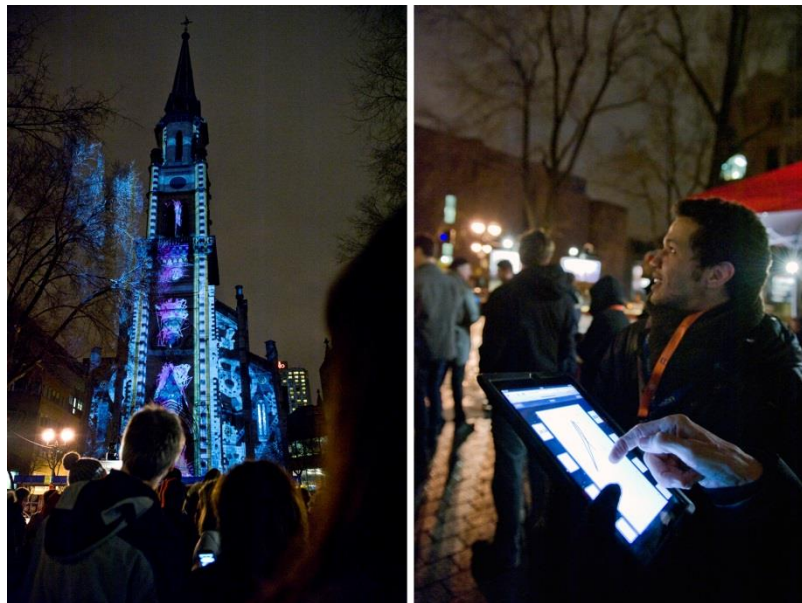Photo credit: © 2012 by Mikaël Charpin. Reprinted with permission.

Figure 3.7 *Tempêtes* **media façade deployed during the** *Digital Pathway*

Quartier des Spectacles district, Montréal, May 20, 2012.
Concept/design: Yan Breuleux, video projected installation.
Photo credit: © 2012 by Martine Doyon. Reprinted with permission.

Figure 3.8   *Trame* **deployment on UQAM's bell tower media façade**

Quartier des Spectacles district, Montréal, February 22, 2012.
Concept/design: 2012 cohort of 20 graduating students, Interactive Media Program, UQAM.
Photo credit: *left* and *right* © 2012 by Nathalie Saint-Pierre. Reprinted with permission.

Figure 3.9   Frontal view of the *Vitrine Culturelle 1* installation

Interactive wall that generates context-relevant signage with 35,000 LED light bulbs.
Quartier des Spectacles district, Montréal, March 2, 2008.
Concept/design: Axel Morgenthaler and Moment Factory.
Photo credit: © 2008 by Martine Doyon. Reprinted with permission.

Figure 3.10   *Vitrine Culturelle 2* installation inside lobby of 2-22 building

Quartier des Spectacles district, Montréal, January 18, 2012.
Concept/design: Moment Factory.
Photo credit: Alexandre Donato.
Copyright: © 2012 by Moment Factory. Reprinted with permission.

Figure 3.11   Luminous fountains in Place des festivals on opening day

Quartier des Spectacles district, Montréal, June 14, 2009.
Architecture and urban design of Place des Festivals: Daoust Lestage Inc.
Engineering: Groupe SM inc.
Photo credit: © 2009 by Sylvie Lebeuf. Reprinted with permission.
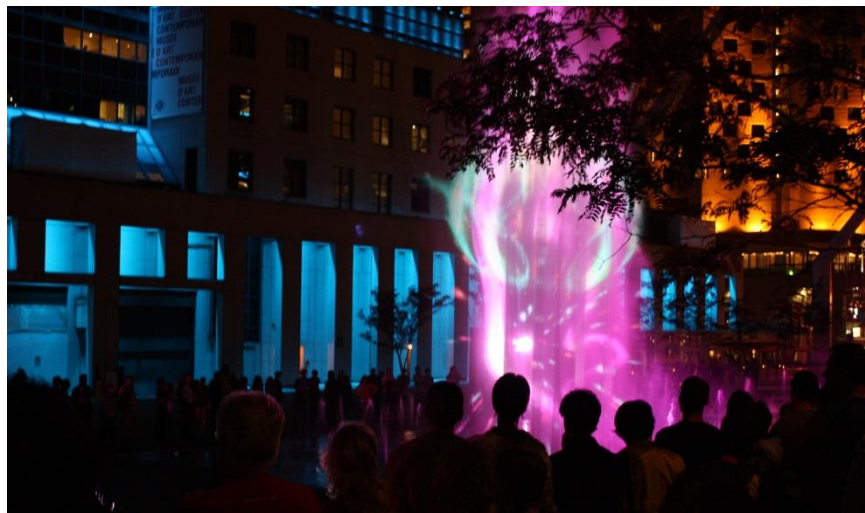
Figure 3.12   *Élixir* video projections on Place des festivals water fountains

Multimedia show that includes music synchronized to video projections on water fountain.
Quartier des Spectacles district, Montréal, August 19, 2010.
Concept/design: Moment Factory.
Photo credit: Moment Factory.
Copyright: © 2010 by Moment Factory. Reprinted with permission.

Figure 3.13   Children playing with water fountains on the Place des festivals

Quartier des Spectacles district, Montréal, *left* (2009) and *right* (2013).
Architecture and urban design of Place des Festivals: Daoust Lestage Inc.
Engineering: Groupe SM inc.
Photo credit: *left* © 2009 and *right* © 2013 by Sylvie Lebeuf. Reprinted with permission.

Figure 3.14   *Bla Bla* interactive animation film deployed in public space

A large trackpad on a luminous plinth serves as a multi-user touch-based input interface.
Quartier des Spectacles district, Montréal, May 20, 2012.
Concept/design: Vincent Morisset, video projected installation.
Photo credit: © 2012 by Martine Doyon. Reprinted with permission.

Figure 3.15   One of *Iceberg*'s seven interactive arch structures

This modular interactive installation calls into question what constitutes a display. Each structure
emits colored light which changes hue over time on a spectrum of blue to red to signify warming.
Quartier des Spectacles district, Montréal, December 29, 2012.
Concept/design: Atomic3 and Appareil Architecture, multimodal installation.
Photo credit: © 2013 by Martine Doyon. Reprinted with permission.

Figure 3.16   *MindWind* installation was projected on modular media façades

Quartier des Spectacles district, Montréal, May 19, 2012.
Concept/design: Herman Kolgen, modular video projected installation.
Photo credit: © 2012 by Martine Doyon. Reprinted with permission.

Figure 3.17   The *By Means of a Sigh* artwork was activated by cell phone

Quartier des Spectacles district, Montréal, May 20, 2012.
Concept/design: Jean Dubois and Chloé Lefebvre, interactive video art installation.
Photo credit: © 2012 by Martine Doyon. Reprinted with permission.

Figure 3.18   *Twenty-One Swings* interactive installation deployed every spring

Quartier des Spectacles district, Montréal, April 22, 2011.
Concept/design: Melissa Mongiat and Mouna Andraos from *Daily Tous Les Jours*.
Photo credit: © 2011 by Martine Doyon. Reprinted with permission.

Figure 3.19 *Twenty-One Obstacles* **media façade video projection**

Quartier des Spectacles district, Montréal, May 18, 2012.
Concept/design: Melissa Mongiat and Mouna Andraos, from *Daily Tous Les Jours*.
Photo credit: © 2012 by Martine Doyon. Reprinted with permission.

Figure 3.20   **Overhead view of the** *Mégaphone* **installation**

Quartier des Spectacles district, Montréal, August 6, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: Frédérique Ménard-Aubin.
Copyright: © 2013 by Moment Factory. Reprinted with permission.

Chapter 4.

Mégaphone or the Interactive Body Politic

Figure 4.1   "Speakers' Corner" wooden platform and megaphone

Promenade des artistes, Quartier des Spectacles district, Montréal, October 4, 2013.
Concept/design: Moment Factory, multimedia installation.
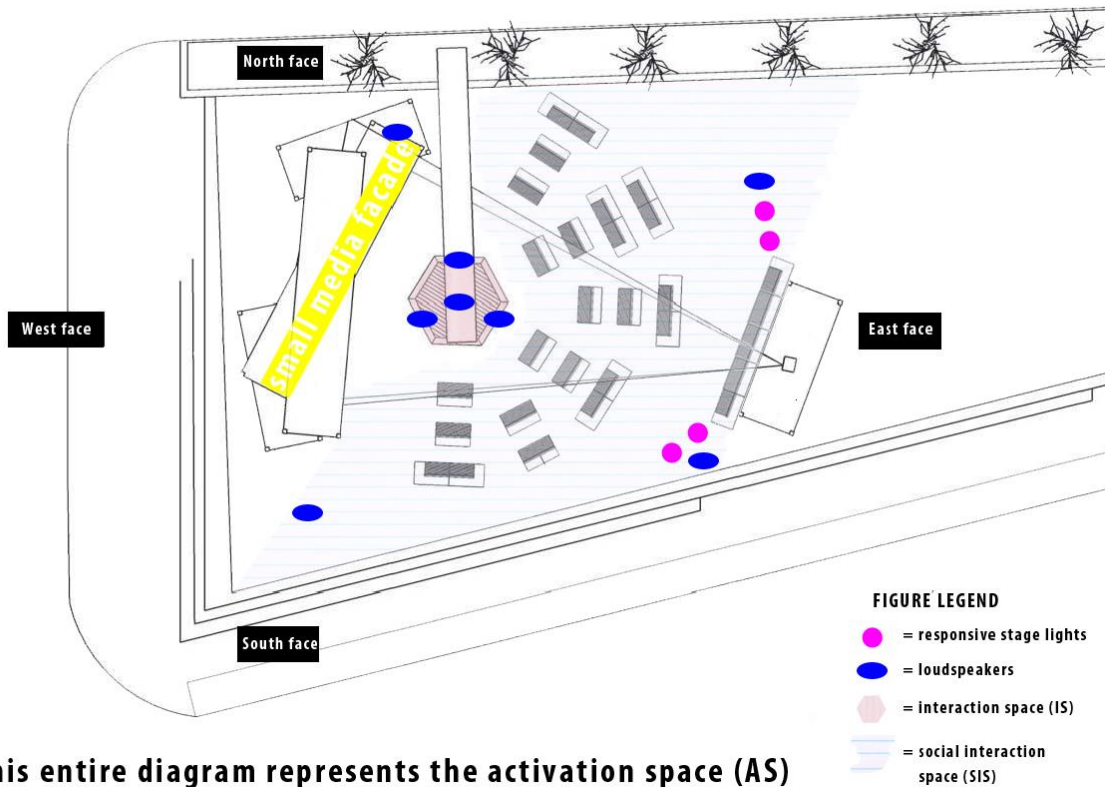Photo credit :   © 2013 by Claude Fortin (field photograph).

Figure 4.2   French buttons lit up on megaphone pole above English button

Promenade des artistes, Quartier des Spectacles district, Montréal, October 9, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit :   © 2013 by Claude Fortin (field photograph).

Megaphone's monumental media facade

North face

Small media facade

West face

East face

South face

FIGURE LEGEND

● = responsive stage lights

● = loudspeakers

⬡ = interaction space (IS)

≈ = social interaction space (SIS)

This entire diagram represents the activation space (AS)

Figure 4.3   Bird's eye schematic view of the *Mégaphone* installation

Types of spaces around media façades and public displays (Fischer and Hornecker, 2012):

Interaction Space (IS) is the space used to carry out a form of communication with the installation. It belongs to a single person, but can overlap with other person's interaction space.

Social Interaction Spaces (SIS) are those areas where people congregate, being attracted by the system, and have a Shared Encounter.

Activation Spaces (AS) are spaces where some displays can be seen from, often triggering curiosity, but interaction is not possible.

Promenade des artistes, Quartier des Spectacles district, Montréal, 2013.
Map design: © 2013 by Quartier des Spectacles.
Overlaid data: Claude Fortin
Copyright: © 2013 by Quartier des Spectacles. Modified and reprinted with permission.

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Figure 4.4   Four stage lights in plexiglass globe casings in center-right

Post Canada unionized workers rallying in a public assembly at the *Mégaphone* installation.
Promenade des artistes, Quartier des Spectacles district, Montréal, October 19, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).
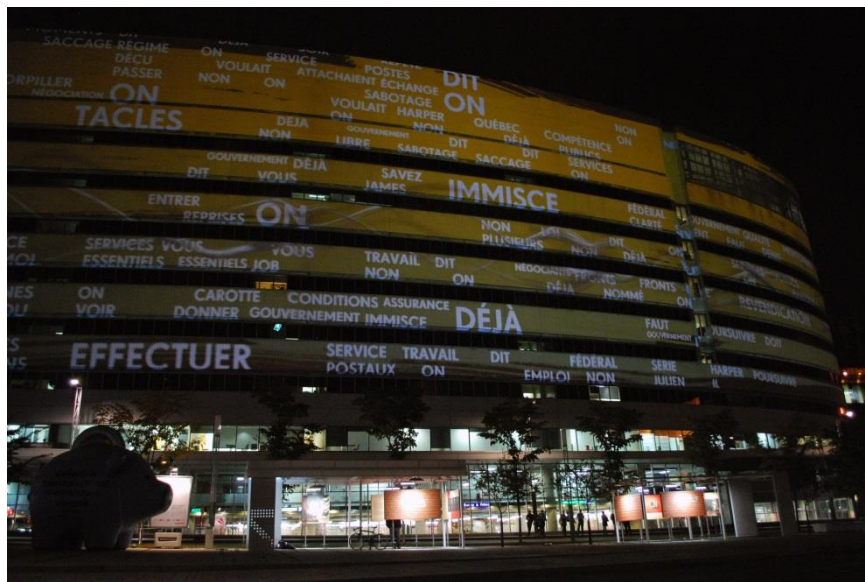

Figure 4.5   Frontal view of the *Mégaphone* installation showing small façade

Promenade des artistes, Quartier des Spectacles district, Montréal, October 2, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).
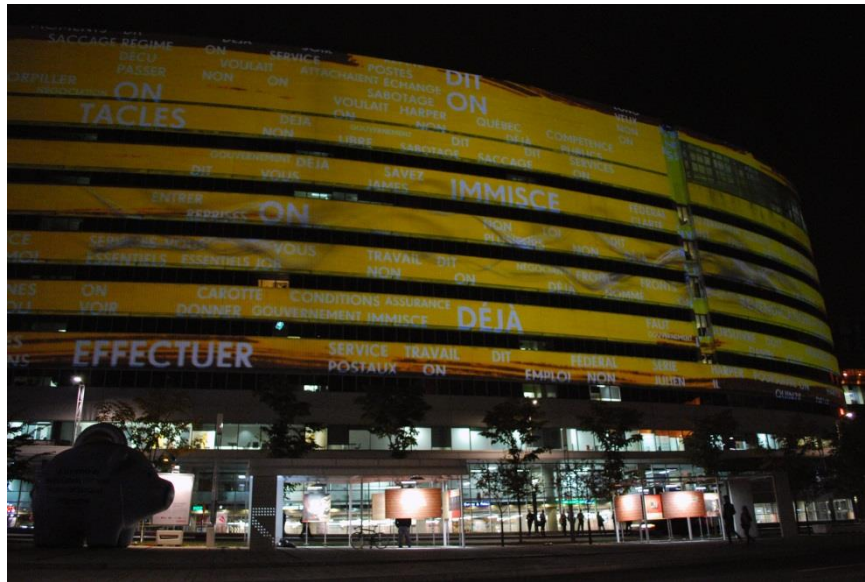
Figure 4.6   Monumental media façade with yellow background in live mode

Promenade des artistes, Quartier des Spectacles district, Montréal, October 19, 2013.
Concept/design: Moment Factory, multimedia installation.
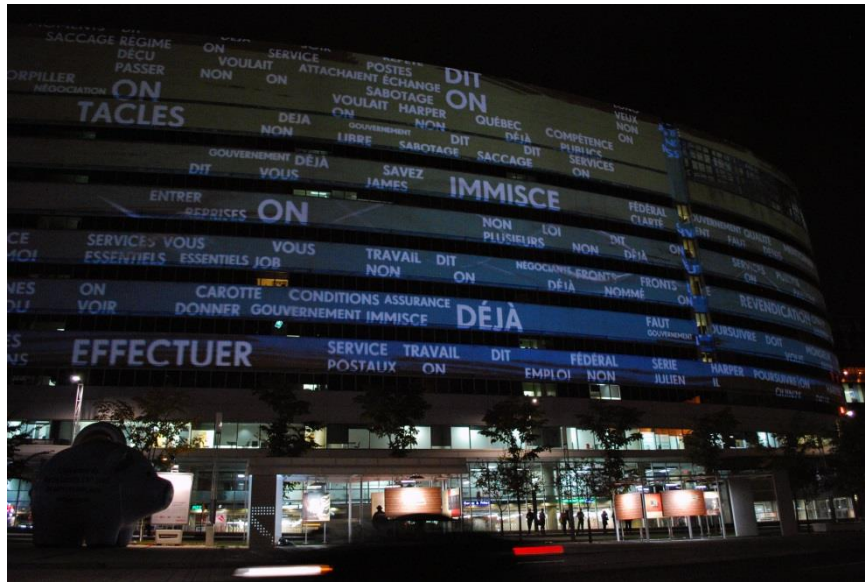Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.7   Background shifting from yellow to green in live mode

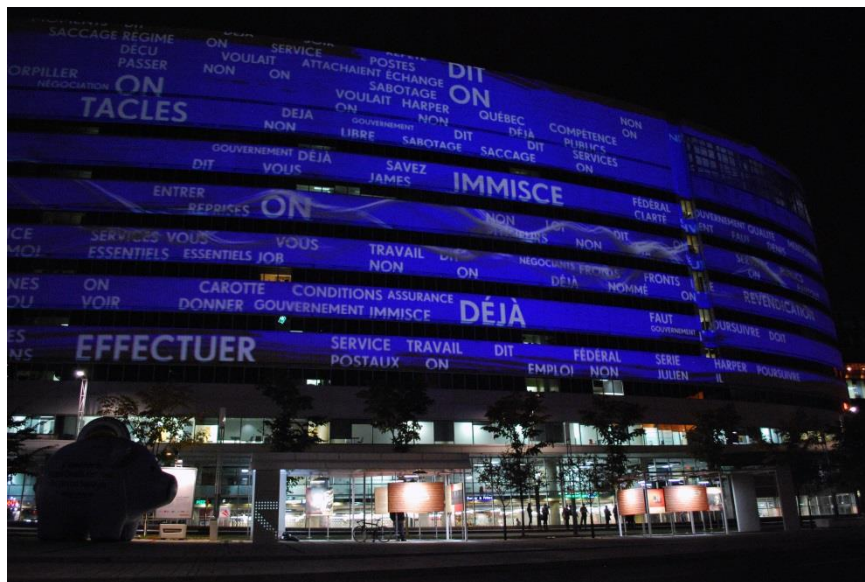Promenade des artistes, Quartier des Spectacles district, Montréal, October 19, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.8   Background shifting from green to blue in live mode

Promenade des artistes, Quartier des Spectacles district, Montréal, October 19, 2013.
Concept/design: Moment Factory, multimedia installation.
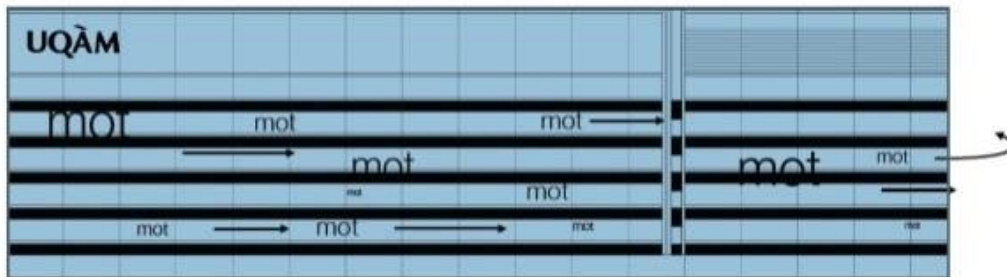Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.9   White curlicues move over a blue background in live mode

Promenade des artistes, Quartier des Spectacles district, Montréal, October 19, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.10   Solid red background in live mode

Promenade des artistes, Quartier des Spectacles district, Montréal, October 19, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.11   Words appear from left to right in live mode

Diagram showing how words are displayed over time on monumental media façade.
Image credit: © 2013 by Moment Factory. Reprinted with permission.

Figure 4.12   Monumental media façade seen at three minute intervals

Promenade des artistes, Quartier des Spectacles district, Montréal, September 25, 2013.
Concept/design: Moment Factory.
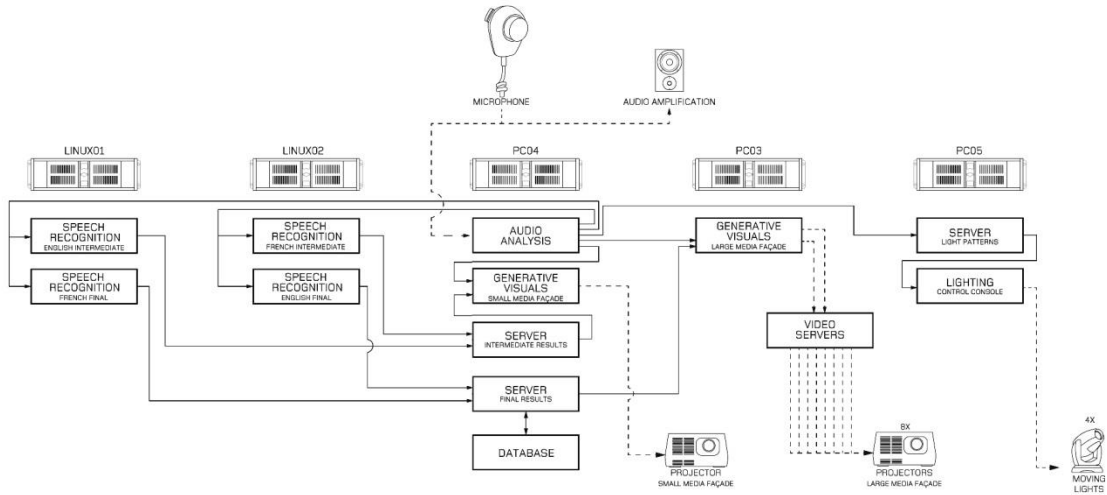Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.13   Monumental media façade in sleep mode

Promenade des artistes, Quartier des Spectacles district, Montréal, October 10, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.14 *Mégaphone* **system architecture**

Diagram showing a detailed description of the system architecture.
Concept/design: Moment Factory, multimedia installation.
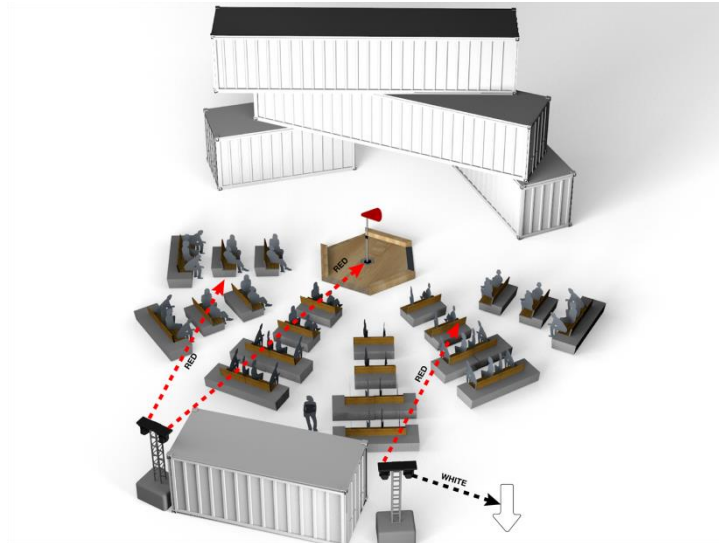Image credit: © 2013 by Alexandre Lupien. Reprinted with permission.

Figure 4.15   Monumental media façade in sleep mode without word filter

In archival sleep mode, the monumental media façade displayed short pronouns suggesting that the filtering out of words ran in live mode but did not apply to words stored in the database. Promenade des artistes, Quartier des Spectacles district, Montréal, September 25, 2013.
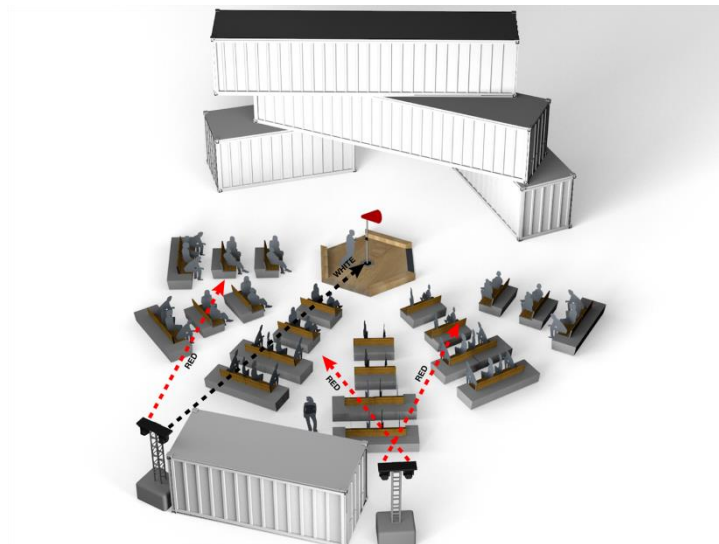Concept/design: Moment Factory, multimedia installation.
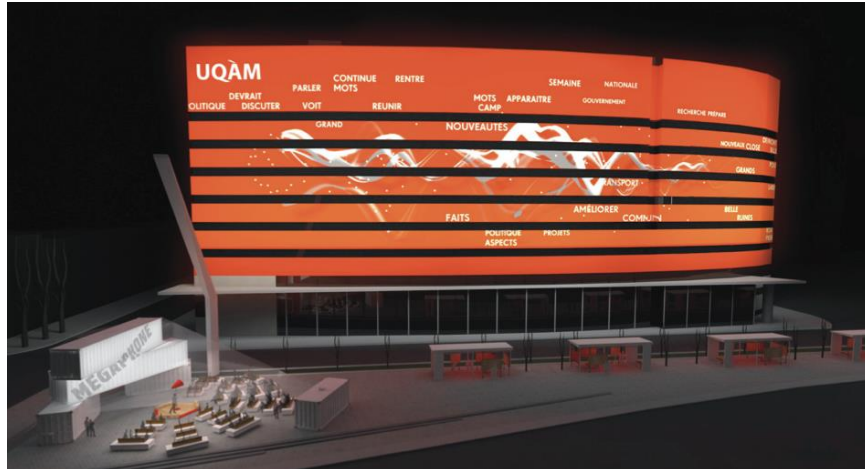Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 4.16   Diagrams of light beams in sleep mode

Concept/design: Moment Factory, multimedia installation.
Image credit: © 2013 by Alexandre Lupien. Reprinted with permission.

Figure 4.17   Diagrams of light beams in live mode

Concept/design: Moment Factory, multimedia installation.
Image credit: © 2013 by Alexandre Lupien. Reprinted with permission.

Figure 4.18   Illustration of intended orange to red background gradient

During pre-production, designers had planned that the monumental media façade would have an orange to red background soft gradient which was impossible to render during onsite testing.
Concept/design: Moment Factory, multimedia installation.
Image credit: © 2013 by Moment Factory. Reprinted with permission.

Figure 4.19   The onsite master control room was in an industrial container

Promenade des artistes, Quartier des Spectacles district, Montréal, October 9, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Chapter 5.

The Mégaphone as a Speakers' Corner: The User as Content Contributor and Observer

Figure 5.1   Mayoral candidates presenting their political platform

Promenade des artistes, Quartier des Spectacles district, Montréal, October 11, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 5.2   The *People's Choir* signing at the "Speakers' Corner"

Promenade des artistes, Quartier des Spectacles district, Montréal, October 4, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (photograph cropped from field video).

Figure 5.3   Regular participant imitating the Master of Ceremony

Promenade des artistes, Quartier des Spectacles district, Montréal, September 20, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

presentation	date	time	theme of presentation
session # 1	Thursday, September 5, 2013	9:00 pm	ideas for transports
session # 2	Thursday, September 12, 2013	9:00 pm	ideas for living in community
session # 3	Thursday, September 19, 2013	8:30 pm	ideas for community
session # 4	Thursday, September 26, 2013	7:30 pm	ideas for residential and urban planning
session # 5	Thursday, October 3, 2013	8:30 pm	launch for the UQAM Urbania publication
session # 6	Thursday, October 10, 2013	8:30 pm	ideas to improve tourism in Montréal
session # 7	Thursday, October 17, 2013	8:00 pm	ideas for the environment
session # 8	Thursday, October 24, 2013	8:00 pm	ideas for design in Montréal
session # 9	Thursday, October 31, 2013	8:00 pm	ideas for recreation and leisure

L'École Urbania's nine one-hour scheduled presentations at the Mégaphone for their series "Imaginer Montréal"

Figure 5.4   Details of L'École Urbania's interventions at the Mégaphone

Table created for this dissertation and derived from field notes collected during empirical study.
Image credit: © 2013 by Claude Fortin.

Figure 5.5   Man turning his back away from a feminist speaker

Promenade des artistes, Quartier des Spectacles district, Montréal, October 9, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 5.6   Woman turning her back to audience as she reads her poetry

Promenade des artistes, Quartier des Spectacles district, Montréal, October 10, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 5.7   Red feathers were dispersed in the agora before an intervention

Promenade des artistes, Quartier des Spectacles district, Montréal, September 25, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).
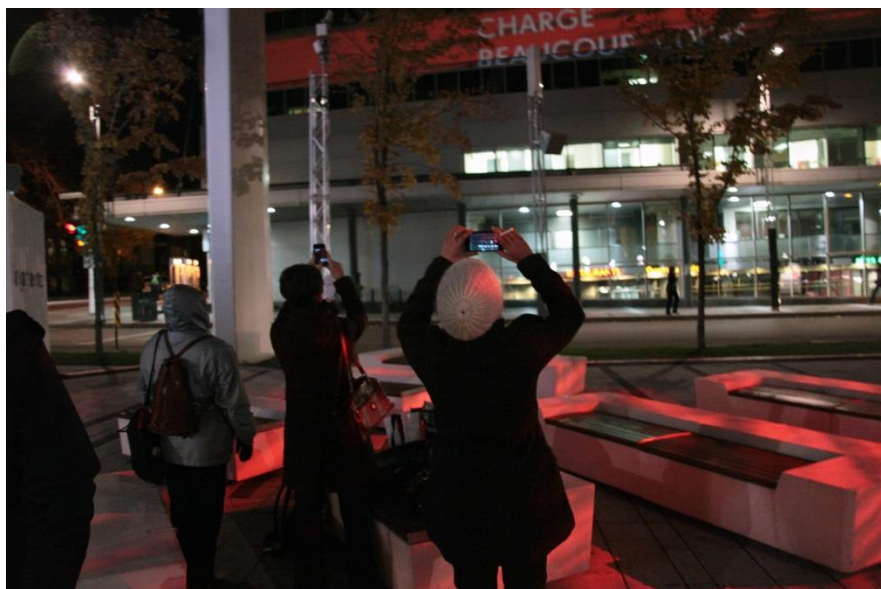
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Figure 5.8   Improvised guerrilla intervention by members of SCCUQ

Promenade des artistes, Quartier des Spectacles district, Montréal, November 1, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 5.9   Members of SCCUQ filming their words on the media façade

Users leveraged the temporal affordances of the Mégaphone database in live and sleep mode.
Promenade des artistes, Quartier des Spectacles district, Montréal, November 1, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Chapter 6.

Appropriating the Mégaphone: The User as Designer

Figure 6.1   There were often "lurkers" during open mike sessions

Regular attendee watching interventions from a position of retreat almost behind installation.
Promenade des artistes, Quartier des Spectacles district, Montréal, September 25, 2013.
Concept/design: Moment Factory, multimedia installation.
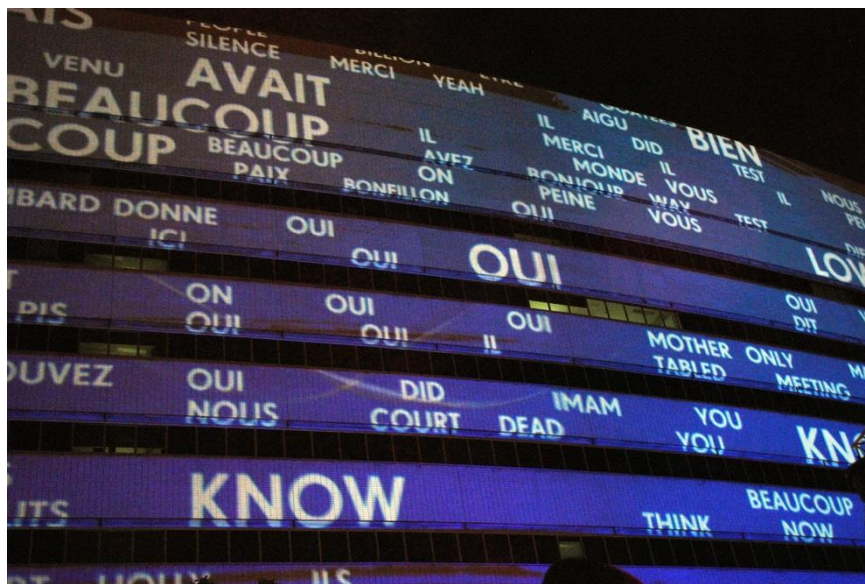Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 6.2   View of media façade and agora during activist intervention

Promenade des artistes, Quartier des Spectacles district, Montréal, October 2, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 6.3   Activists reading the list of names at the "Speakers' Corner"

Promenade des artistes, Quartier des Spectacles district, Montréal, October 2, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 6.4   **Names of the deceased began appearing on the media façade**

Promenade des artistes, Quartier des Spectacles district, Montréal, October 2, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 6.5   **Words would appear several times when repeated "oui"**

Promenade des artistes, Quartier des Spectacles district, Montréal, October 2, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (field photograph).

Figure 6.6   Screen shot of the COPB webpage that published the manifesto

The list of names of the deceased had been compiled by a network of activists across Canada who exchanged and disseminated information online and offline.
Webpage image credit: © 2013 by the Collective Opposed to Police Brutality.
Source: (Internet) URL: https://cobp.resist.ca/

Figure 6.7   Alternative media groups came to film live interventions

Simon Lussier at work as a cameraman for the 99%Media alternative news production group.
Promenade des artistes, Quartier des Spectacles district, Montréal, October 2, 2013.
Concept/design: Moment Factory, multimedia installation.
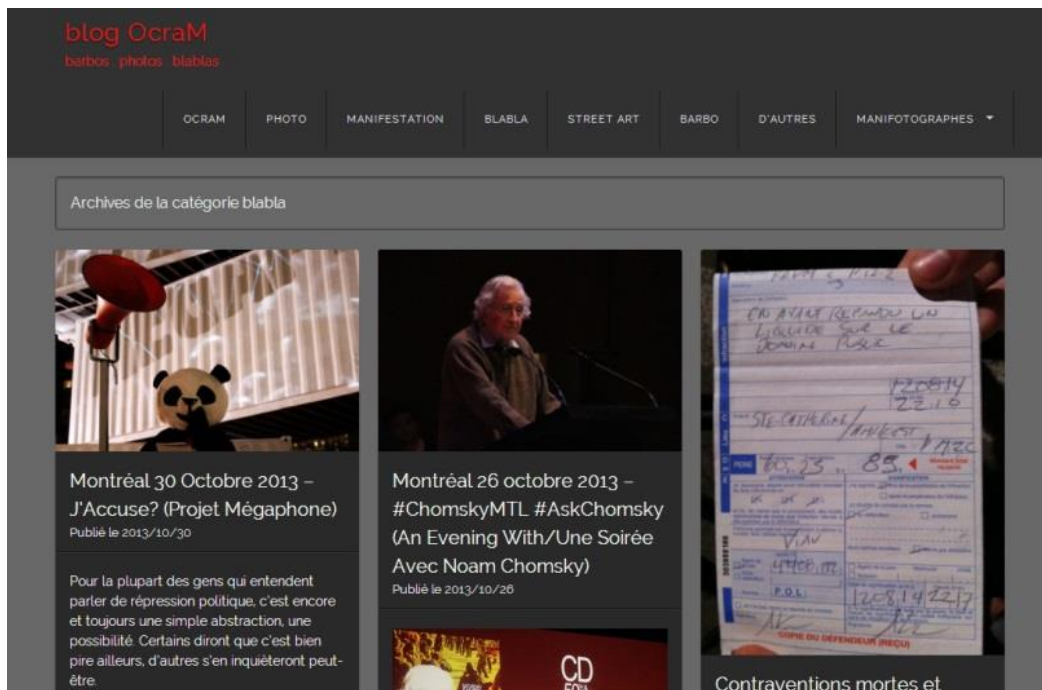Photo credit: © 2013 by Claude Fortin (field photograph)
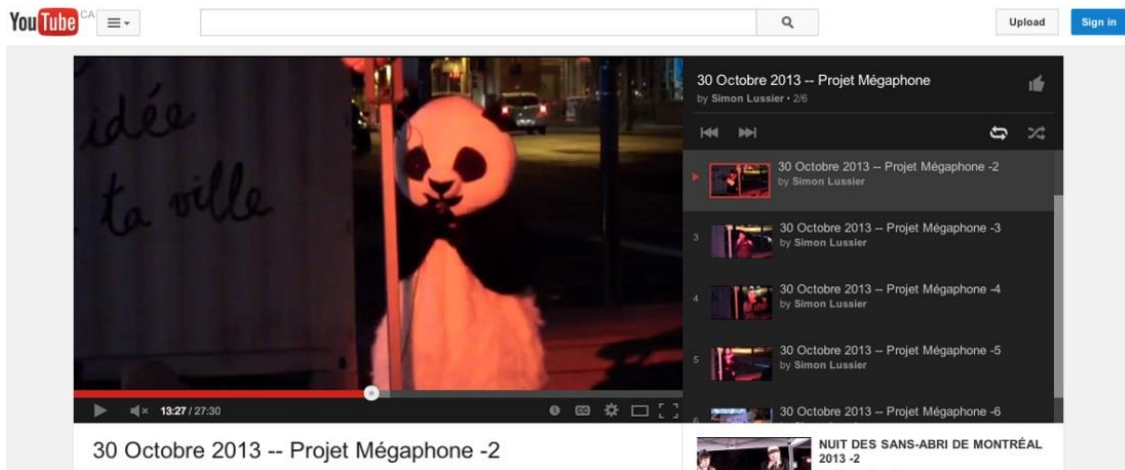
Figure 6.8   Screen shot of activist filmed during Mégaphone intervention

Alternative media outlets would repost the filmed interventions online.
Embedded video image credit: © 2013 by Simon Lussier.
Source: (Internet) URL: https://www.youtube.com/

Figure 6.9   Blog with news column reporting on Mégaphone intervention

Personal and grassroots online blogs also posted images and text to describe the interventions.
Webpage image credit: © 2013 by OCRAM.
Source: (Internet) URL: https://blogocram.wordpress.com/

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Figure 6.10   Screen shot of Anarchopanda's Facebook™ page

The Mégaphone interventions were used as a stage to promote one's identity and cause.
Thumbnail photo credit: Marie-Hélène Tremblay (thumbnail cropped from original photograph).
Source: (Internet) URL: https://www.facebook.com/

Figure 6.11   Briga playing live at the Mégaphone installation

Promenade des artistes, Quartier des Spectacles district, Montréal, November 2, 2013.
Concept/design: Moment Factory, multimedia installation.
Photo credit: © 2013 by Claude Fortin (photograph cropped from field video).
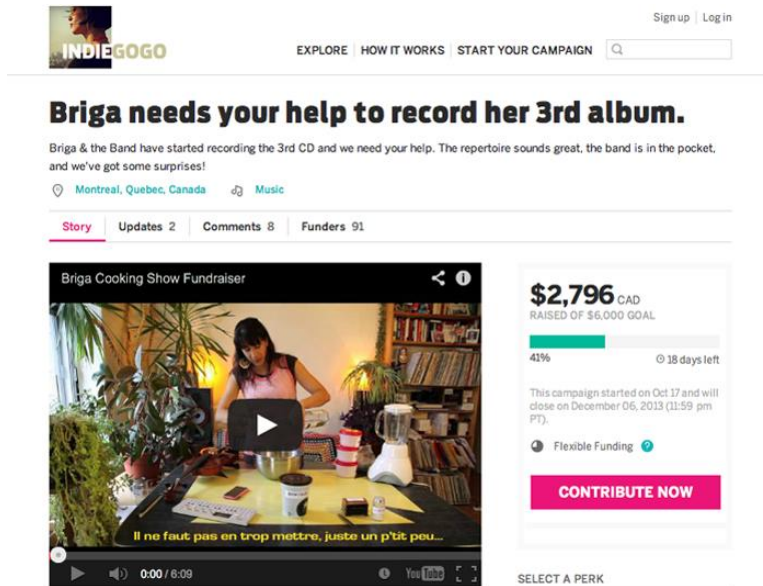
Figure 6.12   Campaign webpage before post of Mégaphone intervention

Briga had originally posted a self-produced video to launch her crowdfunding campaign.
Embedded video image credit: © 2013 by Brigitte Dajczer. Reprinted with permission.
Source: (Internet) URL: https://www.indiegogo.com/
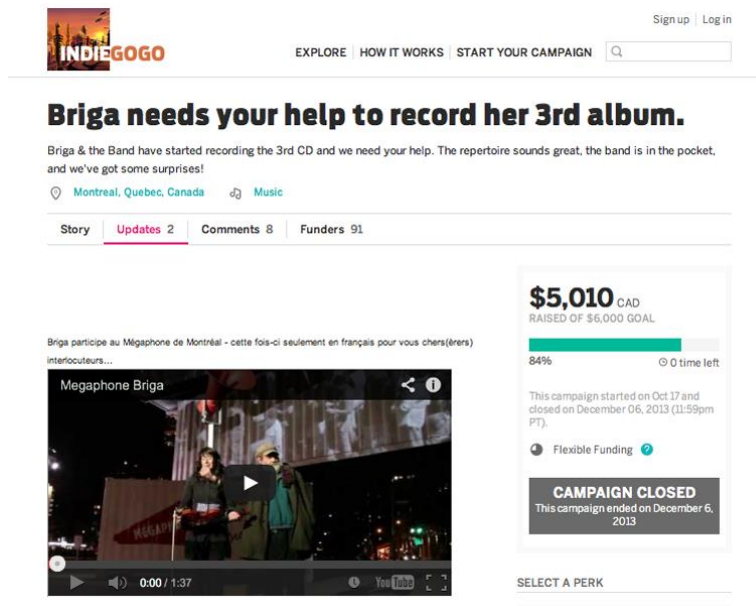
Figure 6.13   Campaign webpage after post of Mégaphone intervention

Briga gave her crowdfunding campaign a bump by posting a video of her live performance.
Embedded video image credit: © 2013 by Claude Fortin. Reprinted with permission.
Source: (Internet) URL: https://www.indiegogo.com/

Figure 6.14   Artwork for sleeve of Briga's third album

Briga used proceeds from her crowdfunding campaign to record and print her third album.
Concept/design: Brigitte Dajczer
Copyright: © 2014 by Brigitte Dajczer. Reprinted with permission.

Figure 6.15   Invitation printed for launch of Briga's third album

Briga also invested part of those proceeds in the launch of her third album.
Concept/design: Brigitte Dajczer
Copyright: © 2014 by Brigitte Dajczer. Reprinted with permission.

Figure 6.16   Photograph of Briga taken to promote her third album

Briga spent the rest of the proceeds on producing professional quality promotional material.
Photo credit: Pascale Thérien
Copyright: © 2014 by Brigitte Dajczer. Reprinted with permission.