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# Delving Deeper: Considerations on applying empirical research methods to infrastructural urban technology projects

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Urban technologies are increasingly designed to support ubiquitous computing, which now includes different forms of digitally-augmented interactions in public space. This shift is underpinned by the development and management of digital infrastructures in metropolitan cities – a paradigm often rhetorically dubbed ‘smart cities’. Because the cityscape is uneven and characterized by diversity, this reconfiguration could be seen as a welcome opportunity to renegotiate the issue of agency in relation to the new technologies embedded in the built environment. Since the Urban Screen project was launched in 2005, digital art installations commissioned for public space have offered propitious terrain for rethinking this issue. Developing appropriate research methodologies, which could better support democratic practices within the infrastructural approach to urban technology design still stands out as pressing and necessary to facilitate the engagement of all concerned. This essay argues in favour of multidimensional approaches over unidimensional ones. To ground this discussion, it first describes the results of a unidimensional study carried out in 2015 in Montréal’s Quartier des Spectacles and then highlights some of the salient differences it presents with a multi-sited field study conducted on the same site from 2012-15. It finally concludes that a multidimensional approach seems more robust.

**Keywords:** digital infrastructures; interactive urban technologies; public space; research methods; case studies.

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### The Infrastructural Approach to Urban Technology

Twenty years ago, Rem Koolhaas (1995) was 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. 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 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. He believed that his plans remained mere three-dimensional images until residents appropriated the spaces to develop their own designs through use and actions; embodied disorder, he wrote, was the only rational means of producing landscape and place. For Kroll, design should be an ongoing process; and buildings were to serve as living laboratories for this process.

The underlying assumption behind these perspectives is that infrastructure was 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' for it would provide the framework upon which artistic experimentation could take place (p. 969). Today, the emerging corpus of research on digital infrastructures may prove to be foundational to the daunting task of fully integrating technology into the built environment. Much like Koolhaas and Kroll, Dourish and Bell (2011) argue that the digital infrastructures that support today's ubiquitous computing are inherently messy, heterogeneous, and locally shaped by power relations between people. Indeed, as Forlano's (2006) work suggests, the development of a user-centered, participatory approach to the design of interactive systems can actually be facilitated by access to such infrastructures. But agency in the design process is never a given; it must be unrelentingly negotiated over and over again. Accordingly, in the dawn of so-called 'smart cities', appropriate research methodologies are needed to harness the full potential of an infrastructural approach to urban technology design – approaches that support democratic design.

Empirical research undertaken from 2012-2015 within the Quartier des Spectacles' one square-kilometer digital infrastructure provided a favorable context to assess these approaches (Fortin, 2016). The following reflects on some of the lessons learned from this three-year doctoral research program. It does so by first, describing the site and introducing the Common Space project under study in this essay; second, briefly discussing a few approaches currently being used to include the input of citizenry in urban technology design; third, describing a new, multidimensional methodology that was used in a field study undertaken in the Quartier des Spectacles; fourth, presenting the findings of the Common Space study later conducted with a unidimensional methodology; and fifth, concluding by assessing the main differences between a multidimensional and a unidimensional methodology.

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### Montréal's Quartier des Spectacles: Digital Infrastructure or Urban Laboratory?

Located in Montréal's central business district, the Quartier des Spectacles is a site administered by the Quartier des Spectacles Partnership ('Partnership'), a non-profit subsidiary of the municipality. It comprises a digital media architecture infrastructure made up of nine digital media façades used to showcase public art and deploy urban interventions. A web of ten kilometers of fiber optic cables are laid out below ground level throughout the whole area to connect the master control room with the interactive artefacts located in various emplacements within the site. Because it can support real time transfers of massive data flows, this robust permanent setup has the capacity to facilitate all kinds of new media artistic experimentations in outdoor urban settings. As a result, the Partnership announced in 2014 their intention to make their site available to creative talent as a digital urban laboratory.

Several empirical studies were conducted on this site between 2012 and 2015. Each provided a unique opportunity to examine the way digital technology might be used to support more participatory models of social and civic interaction in public spaces, but more importantly, to put to the test different methodologies that could serve this purpose. The aim of these studies was also to identify some of the design challenges that may arise when digital creativity is supported by an infrastructural approach. While a three-year multidimensional field study was the main subject of the author's doctoral thesis, in the last leg of her research program, she conducted a three-week study that is presented for the first time in the last section of this essay. Its object is *Common Space*, a project that offered local and international artists an opportunity to ideate, develop, and create eight digital artworks, which were then deployed within the Quartier des Spectacles district from October 1st to 18th, 2015. Co-produced by the Partnership, the National Film Board of Canada (NFB), and MUTEK – a Montréal-based organization dedicated to the development and dissemination of digital artistic works – *Common Space* was the Canadian offshoot of HUMAN FUTURES: SHARED MEMORIES AND VISIONS, an international collaboration between several cultural partners: FACT in Liverpool, PIT/CAVI at Aarhus University in Denmark, the Public Art Lab in Berlin, the Media Architecture Institute in Vienna, as well as the Quartier des Spectacles, the NFB, and MUTEK in Montréal. Under the aegis of the HUMAN FUTURES initiative, *Common Space* received financial support from the European Union's Culture Programme and the Conseil des arts et des lettres du Québec (Viau, 2015).

The HUMAN FUTURES initiative saw, over the course of a year, thirteen artists from seven countries matched into teams to produce public artworks that would interrogate the relationship between people and technology within the project's four different spatial themes: cognitive space, living space, networked space, and urban space (Human Futures, 2014). An international endeavour with programmed local outcomes, the Montréal chapter of HUMAN FUTURES became the opportunity to showcase eight publicly commissioned artworks that were deployed in the *Common Space* video projection circuit illustrated in Figure 1. The artists were simply asked to design digital installations that could provoke reflections, dialogues, narratives, and new ways of imagining urban environments among the general public when encountered in the Quartier des Spectacles. More specifically, the press release that announced the launch of this event states: 'Through technology, video projections and interactive tools, they [the artists] set out to reconceptualise our perception of that environment, which rather than remaining a grouping of imposed structures becomes a pliable entity that can be changed through design and creation [*sic*]' (Lamoureux, 2015, para. 2).

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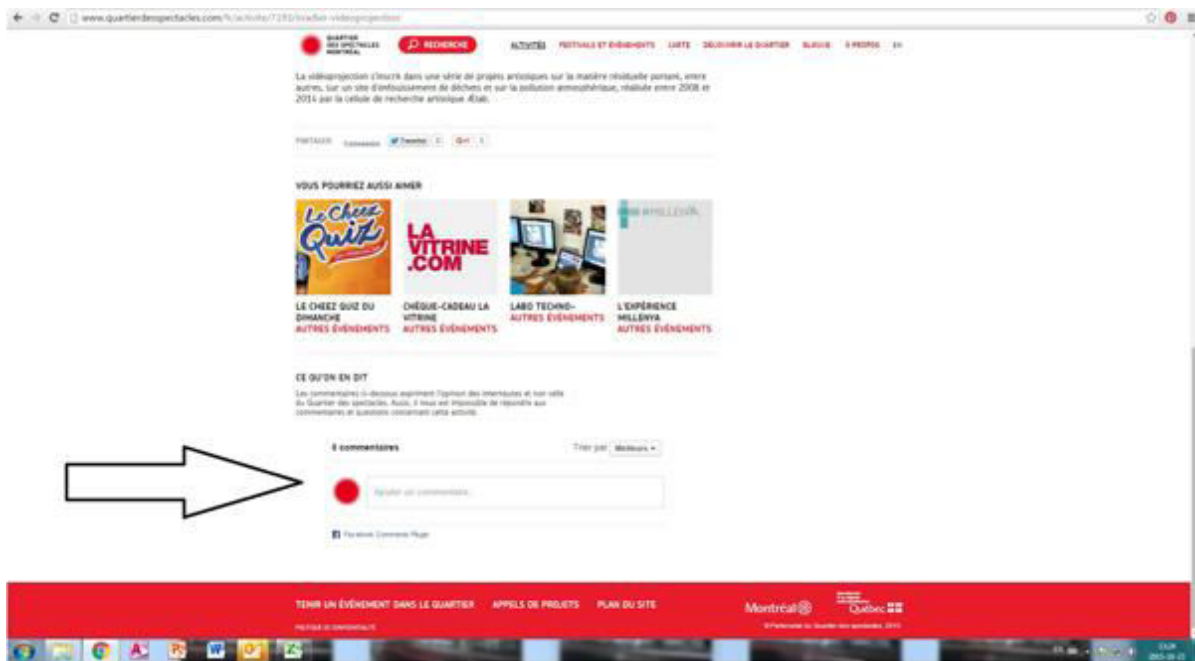
**Figure 1.** Map showing the location of the eight *Common Space* artworks deployed in the Quartier des Spectacles district, Montréal, Canada, October 1, 2015. *Source:* The Quartier des Spectacles (© 2015). Used with permission.

These bold rhetorical claims were made by the cultural partners and co-producers who directly and collaboratively managed the digital infrastructure within which the artists were given space to artistically interpret this thematic vision. While these claims are repeated throughout all of the promotional material and public presentations, it is noteworthy that none of these cultural partners made plans to obtain feedback from the general public or any of the participants who did engage with the interactive artworks – a fact corroborated by the Partnership’s incumbent programming director during the interview conducted a few days after the deployment (P. Daigle, interview, October 21, 2015).

**Some Methodologies in Support of the Infrastructural Approach**

In the case of urban digital co-productions between the Partnership and the NFB, this is by no means unusual. As a matter of fact, since the inception of their media architecture infrastructure in 2008, the Quartier des Spectacles Partnership has deployed scores of interactive art installations for the benefit of the general public without ever taking steps to collect the latter’s feedback. For instance, although both organizations have a mechanism through which they can invite people to contribute comments on their respective websites, neither have actually ever made arrangements to have trained experts conduct quantitative or qualitative evaluations of their deployments in public space to gather inductive data that would help them assess how successful these are. Figure 2 shows the means through which people can communicate with the Partnership from its website; the NFB has a very similar intake tool at the bottom of most of their web pages.

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**Figure 2.** Screenshot of the generic online feedback form on the Quartier des Spectacles website, captured online on October 22, 2015. *Source:* The Quartier des Spectacles (© 2015). Used with permission.

Beyond the more mundane issue of lacking basic statistics to efficiently measure the popularity or participatory nature of the works, this information gap has at least one other far-reaching consequence. It implies that some public institutions involved in delivering digital infrastructures and their artistic by-products do not scientifically study their impacts, namely, how people outside their institutions receive, perceive, and experience the artifacts during the deployments. How then can they identify their strength and weaknesses? How can they learn lessons from their design-in-use? How can they evaluate whether they meet a public need? How can they know whether these artworks foster a public sphere? How can they determine what the design challenges and opportunities are for the different stakeholders involved? And finally, how can they build on a body of empirical knowledge that would allow them to improve their digital infrastructure in order to lead to innovations that are more cutting-edge and meaningful to all?

User-centered ethnographic approaches to ubiquitous computing are typically advocated by design practitioners in the field of human-computer interaction. However, they are also often criticized for simply producing an ‘implications for design’ laundry list that is meant to generate ‘requirements for systems development by providing a clear sense of “what users want”’ (Dourish & Bell, 2011, p. 64). Rather than being instrumentalized this way, it is argued that when ethnography is used to produce a generative account of cultural practices, rather than a taxonomic one that emphasizes streamlined data, the analyses generally yield a broader scope and longer shelf-life, which can better support a sense of collective responsibility and participation in the practice of design, and of course, in design-in-use. This is in part, because, as participant observers, engaged ethnographers are equally as accountable to their informants, as they are to institutions and experts. But it is also because – even though it is bias by design – the analytical component of an ethnography makes



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arguments that go well beyond general facts; it reaches into the details of specific instances of what actually happens.

A case in point is the three-month field study of *Mégaphone* conducted in fall 2013 (Fortin, 2016); it was conducted more than two years before the Common Space case study. The object of the *Mégaphone* ethnography was the interactive ‘Speakers’ Corner’ shown in Figure 3, which was created by the Moment Factory multimedia design studios and co-produced by the Partnership and the NFB. Although these three stakeholders agreed to fully collaborate with the author of this essay who was the principal investigator (PI), none had thought of commissioning a study or devising a means to collect qualitative feedback prior to being approached by a doctoral student eager to do this as a graduate research project. Some of these stakeholders have since expressed that the empirical and analytical materials produced from this study has provided them with valuable insights on design-in-use and live site attendance. Yet, none has had a qualified social scientist collect data and conduct analyses for any of the deployments that have followed since.



**Figure 3.** View of the *Mégaphone*'s ‘Speakers’ Corner’ with the monumental media façade in the background, interactive public art installation, created by Moment Factory, conceptualized by Étienne Paquette, and presented by the National Film Board of Canada and the Quartier des Spectacles, Promenade des artistes, Montréal, Canada, October 2, 2013. *Source:* Claude Fortin (© 2013).

The fact that no record or report exists of how users receive and experience digital artifacts deployed by these stakeholders supports Gazzola and Baltazar’s (2015) remark in reference to Yona Friedman’s work: ‘the infrastructure model...is the paradigm that still dominates current approaches and that it only gives limited freedom for the user, which is subject to a limited design space within the boundaries defined by the proposed infrastructure’ (p. 47). Differently put, it dismisses the idea of the users as designers and disregards the actual needs of the very population they seek to provide services and culture to. More problematically, this omission turns the design process into a closed loop that excludes the end users as a stakeholder, thus limiting the potential for innovation that can emerge

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between stakeholders espousing opposing views. In fact, one could say that the term 'end users' would only be appropriate in the context of such an exclusion because once they are consulted and actively involved in this design loop, end users effectively become design stakeholders in their own right (Latzko-Toth, 2014).

### Three Years in the Making: The Mégaphone Research as a Multidimensional Field Study

This was the hypothesis that drove the Mégaphone field study, which was conducted with 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 involved conducting short, unstructured interviews with scores of participants onsite, and longer semi-structured one-hour interviews with over twenty study participants recruited onsite or through the snowballing technique. Finally, experts such as designers, computer scientists, technicians, producers, and others involved in the planning and maintenance of the display infrastructures were also interviewed. This wide sampling approach was supported by previous research on the design of interactive display-based digital urban technologies, which emphasizes the importance of identifying and aligning the interests of the multiple groups of stakeholders involved in large-scale public installations (Dalsgaard & Halskov, 2010).



**Figure 4.** Multi-sited ethnographic methods were adopted to conduct the **Mégaphone** field study, Promenade des artistes, Montréal, Canada, October 4, 2013. *Source:* Vincenzo Fibbiani. Used with permission.

However, in keeping with the recent drive to reinvigorate the idea of the user as designer in order to harvest the potential of democratic design, the Mégaphone study tended to focus more on participants and what took place during the deployment. Every evening from 7-11 pm, on Wednesdays, Thursdays, Fridays, Saturdays, and one Monday, the PI was immersed within the installation space (see Figure 4), at times participating in the interventions, and at

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other times, adopting the ethnographer's 'fly on the wall' approach to make observations about how people used the Mégaphone. Conducted during 37 days over a period of ten consecutive weeks, this field work saw at least 4,800 people occupy the installation space to participate in the installation either as speakers or as observers. Out of all those, well over 1,000 of them were seen interacting with the system by speaking into the microphone, which was the only input interface that could be used to interact with this urban technology.

The Mégaphone research protocol cannot be categorized as participatory design because users were not involved during the ideation and design phase (Williams, Lindtner, Anderson, & Dourish, 2014). The design team delivered the technology as a finished product, and although they did make fine adjustments based on the odd end user comment made to the onsite technician during the deployment, these improvements were purely cosmetic (i.e. sound levels, color rendering, brightness, etc.). The Mégaphone study research design also does not meet the objectives proposed by Gazzola and Baltazar (2015) which consists in using applications that are free of human judgment – such as parametric modelling tools – to allow users to add metrics to an existing system, and thus suggest contributions during design-in-use; in Gazzola and Baltazar's research model, in keeping with Latour, agency 'is not a responsibility of a single "actant" but of the collective action...[of users acting autonomously]...in the production of the city' (p. 45).

While both these approaches strive toward design democratization and an understanding of agency as a collective, political responsibility, by contrast, the Mégaphone study was primarily concerned with assessing whether a multi-sited design methodology might provide an effective tool to help bridge the gap between the expert top-down approaches to new media technology design and the bottom-up community digital practices that shape *in situ* usages (Fortin, 2016). Specifically, Chapter Six titled, 'Appropriating the Mégaphone: The user as designer' sets out to demonstrate that participant observation is a research method that can be used to stage and frame opportunities for innovation that come about *during the deployment*. Here, agency in the design process did not emerge as one collective action, but rather, as clusters of collective actions that met the needs of not one, but of many micro-publics and communities of practice; after all, ethnography finds its legitimacy in the assumption that process and experience can be studied to produce knowledge from the exchange of meaning between informants – a world view that supports the collective production of meaning. However, just as the public sphere can be said to be fragmented into multiple public spheres, so may the needs of 'end users'. Moreover, the findings were triangulated from field observations, audio-visual recordings, and interview data, and as such, the resulting analyses were not generalizable since they were the PI's personal, subjective interpretations of the empirical material collected in the field (Fortin, 2016).

Aside from this last limitation, the most important consideration about adopting a multi-sited approach to conduct the Mégaphone study was the danger of inadvertently instrumentalizing this methodology for the purpose of top-down urban technology design. For instance, in architecture and urbanism research, Post Occupancy Evaluation (POE) has been used for several decades now 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 occupants will provide valuable data that will be used to improve the design of a given building, in fact, the research results can often be compiled to legitimize the idea that occupants have been consulted – and following this, be co-opted to endorse a particular view that existed prior to



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data collection. Indeed, some say that this approach can be rhetorically used to 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 draw the composite portrait in alignment with the class interest of the expert stakeholders. This might also be a fair critique of the *Mégaphone* study were it not for the fact that the PI, on the one hand, had no prior ties with the stakeholders, and on the other hand, became deeply involved in the research process as a participant observer by collaborating with diverse stakeholders in epistemic partnerships across class, gender, and racial distinctions, including activists that were highly critical of the Quartier des Spectacles. This is both the strength and weakness of multi-sited ethnography: by hinging on the subjective engagement of the PI, it places the onus of knowledge translation onto the person of the ethnographer.

### **Common Space: A Unidimensional Study of the Infrastructural Approach**

Two years after the three-month *Mégaphone* deployment, the Quartier des Spectacles programmed the three-week Common Space project. Accordingly, following the *Mégaphone* longitudinal field study, the PI conducted one last empirical research project in the context of her doctoral program to further investigate the development and impact of urban technologies designed under an infrastructural approach: the Common Space study. Since the two Partnership-sponsored events offered the public a wide variety of ways to interact with urban art installations in the Quartier des Spectacles, both studies presented the PI with occasions to identify some of the challenges that come up when urban technologies are designed and implemented in a context involving a digital infrastructure at its core.

But contra the *Mégaphone* study which was multidimensional in that it juxtaposed the perspectives of a diversity of stakeholders, the Common Space study was unidimensional in that it was based on collecting data from a single stakeholder, namely, the Partnership. Two days into the deployment, on October 3, 2015, the PI attended a two-hour public talk hosted by the co-producers in downtown Montréal, during which time each artist had fifteen minutes to present their artworks and answer questions on their creative process in relation to the Common Space deployment. Then, a few days after the end of the deployment, the Partnership's programming director and production coordinator – two key members of the Common Space co-production team – were interviewed in person together in their offices for a period of one hour. Their administrative assistant subsequently sent the PI all of the promotional material tied to this project, which included a press kit, press releases, photographs, and links to promotional videos. The following discusses the three major challenges identified from the triangulated analysis of the PI's personal notes, of the interview data, and of the promotional material.

### ***Public Space Cohabitates with Private Space***

The first challenge that the Partnership reported was the difficulty of negotiating private space within public space. The Quartier des Spectacles district can be described as a managed public space that spans one-square kilometer. However, within its perimeter, there are private residential buildings, housing co-ops, city housing complexes, public institutions such as university campuses and public libraries, and of course, commercial businesses that are occupied by both tenants and propriety owners. When the Partnership made a call for projects that would use the district as a laboratory to reconceptualise urban space, they did not realize the extent to which artists might want to use spaces that were beyond the Partnership's jurisdiction. During the interview, the co-producers explained that they kept an open mind about approaching the private stakeholders listed above to obtain permission to

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use their territory for the duration of the Common Space deployments, but not all those approached gave their permission. Further, asking permission required time and resources that went beyond the agreed engagement. One of the lessons the Partnership learned from this project was the importance of parsing the management of private space and public space: ‘this deployment made us realize that trying to obtain authorizations from private occupants can quickly become too much to manage’ (L. Montmarquette, interview, October 21, 2015).

There were several examples of similar disjunctures between private and public space in the context of the Common Space project. In particular, Sébastien Pierre and Daniel Canty’s **Îles Invisibles** posed many problems in this regard. First, in their original artwork, the artists wanted to situate some of the offnet terminals and boxes shown in Figure 5 in remote places that had a clandestine feel to it – such as one hidden corner in an alleyway – to bring participants into intriguing locations that gave depth to the narrative. However, this would have involved asking city-dwellers to access and supply electrical facilities from their own private properties, a proposition that the Partnership found untenable, not to mention the fact that identifying the parties to contact for authorization would have represented a great deal of effort on the part of the co-producers. The Partnership could easily have obtained such assistance from local theatrical venues, but the locations that the artist had in mind were small businesses and private condos. Thus, they negotiated a compromise with the artists. As an alternative, the Partnership proposed specific locations where they already had an existing electrical facility for deployments (L. Montmarquette, interview, October 21, 2015).



**Figure 5.** View of one of the terminals and blue stenciled graffiti of **Îles Invisibles**, *Common Space* interactive offnet art installation, created by Sébastien Pierre and Daniel Canty, Quartier des Spectacles district, Montréal, Canada, September 30, 2015. *Source:* Martine Doyon (© 2015). Used with permission.

Second, the blue marks shown on the ground around the terminal shown in Figure 5 were conceived as graffiti that played a crucial part in the narrative of **Îles Invisibles**. In the original proposal, there were graffiti and stickers that would contain symbols – which would

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allow people to follow the narrative thread – and codes which participants would use to discover some of the content as they navigated their way through the narrative in public space. The graffiti was presented as a point of focus. However, the city of Montréal has by-laws against graffiti. To override these for the purpose of an artistic production in public space, the Partnership had to make a special request with the municipal body in charge of this more than six weeks in advance. More problematically, the artists wanted to draw some of these graffiti on private property. In drafting these requests, the Partnership had to precisely list exactly how many stenciled graffiti would be produced and their exact location, a procedure that does not necessarily support a spontaneous artistic approach. In the end, to obtain the required permissions, the Partnership had to make the graffiti themselves, which fell outside of their usual expertise – with, for instance, having to find a paint that could wash off after a month (L. Montmarquette, interview, October 21, 2015).

Third, the artist also wanted to include a box of chinks at each station which participants would use to write codes or comments for other participants to find. Again, the Partnership would have been left with making sure there was always a fresh supply of chinks and that people didn't use them for other purposes or to write inappropriate messages in public space. For instance, the Partnership was concerned that some people might use the chalk to deface local condo properties. For this reason, they asked the artists to design the artwork without the chinks; for they did not have the resources to provide these services, nor monitor emerging content on the ground, while they also had to manage the seven other artworks at the same time (L. Montmarquette, interview, October 21, 2015).



**Figure 6.** View of the storefront window displaying **A Side Man 5000 Adventure**, *Common Space* public art installation, created by Darsha Hewitt and Nelly-Ève Rajotte, Goethe-Institut in the Quartier des Spectacles district, Montréal, Canada, September 30, 2015. *Source:* Martine Doyon (© 2015). Used with permission.

Another example of tension between private space and public space occurred with Darsha Hewitt and Nelly-Ève Rajotte's **A Side Man 5000 Adventure** seen in Figure 6. In the original proposal, the project included a video projection onto the Goethe-Institute building where it was deployed. However, the production had not been notified that there were classes

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scheduled in this building during the same hours as the video projections. As a result, the project had to be rethought at the last minute because the façade used for the video projections was located outside this classroom. Further, the special display that was deployed included a sound component emitted by a beat box, which became highly problematic because the Goethe-Institute has had many complaints from local residents in the past, which has forced them to comply with low sound levels when their speaker units are used in the evening. In the end, the artists were disappointed with their artwork because it could not be shown and rendered in the way that they had planned (P. Daigle, interview, October 21, 2015).

The above examples illustrate how part of the artist's creative process for **Îles Invisibles** and **A Side Man 5000 Adventure** came to either be changed, shared or transferred onto the Partnership due to the legal constraints that apply to an infrastructure where the boundaries between public space and private space are at times fuzzy. The next challenge also highlights how the Partnership's involvement in the Common Space project went well beyond managing and producing the deployments; they also came to exercise some degree of creative agency.

### *The Ethics of Technical Support*

The issue of the maintenance and the restoration of the eight digital artworks was the second new challenge the co-producers faced. This was an unusual scenario for the Partnership; typically, during the deployment of digital artifacts, it is the artists themselves that maintain electrical components or fix bugs in the code. But with Common Space, most international artists came to the Quartier des Spectacles to set up their work and then immediately left for Europe. As a result, it was not possible for them to trouble-shoot the technical problems that came up onsite. Because their ability to intervene at such a great distance was limited, the Partnership was obliged to undertake repairs when breakdowns required rapid, onsite presence. This meant that the Partnership sometimes had to make judgment calls about repairs that overlapped with issues of artistic license (L. Montmarquette, interview, October 21, 2015).

For instance, each of the fifteen terminals of the **Îles Invisibles** installation had to have a custom-made box, which contained the electronic hardware (i.e. circuits and antenna) that would deliver the offnet content to participants. Against the advice of the Partnership who recommended having the boxes made in industry, the artists insisted on using a 3D printer to produce those boxes themselves. Further, the Partnership strongly suggested that they be made of polyvinyl chloride resin (PVC) in order to be as weatherproof as possible, but the artist chose to produce them in another material. When it rained during the onsite testing phase, the boxes got soaked and consequently became unusable. Just one day before the deployment, the Partnership handled this problem by covering the boxes in plastic freezer bags after having obtained the artists' approval (L. Montmarquette, interview, October 21, 2015).

Problems with the telephone booth in Sam Meech and Marilène Gaudet's **We're All Friends Here** installation presents another good example of how the Partnership was obliged to intervene well beyond its usual mandate. For this piece, the artists had interviewed Montrealers to get a sense of what it feels like to live downtown; these experiences were then visually translated into jacquard knit patterns that were video projected on media façades while people could listen to each interview by picking up the handset in the telephone booth shown in Figure 7. The interactive affordance of this piece was that



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pedestrians could add their own contribution to the audio database and the knitted forms by leaving a voice mail message when they used that telephone (Tremblay, 2015).



**Figure 7.** View of the telephone booth and one of the media façades designed for **We're All Friends Here**, *Common Space* video projections and interactive public art installation, created by Sam Meech and Marilène Gaudet, Quartier des Spectacles district, Montréal, Canada, September 28, 2015. *Source:* Martine Doyon (© 2015). Used with permission.

A few days after the launch, once Sam Meech had returned to the UK, his system malfunctioned. People couldn't hear any of the interviews when they listened into the handset. The Partnership contacted the artist and they were able to collaborate with him remotely to fix the problem with the system. However, shortly after, the telephone booth was severely vandalized. The telephone was completely destroyed, thus making this part of the installation defunct. Given that the artist had bought the handset in an antique store, it was a unique component that couldn't be replaced as it was. Because Meech was in Liverpool at the time, the Partnership had to find, buy, and install a new telephone within 48 hours, and then solder a new microphone and other electronic components inside what was left of the handset. This restoration process – which is generally the resort of conservation practitioners in museums – was quite beyond the expertise of the Partnership's personnel (L. Montmarquette, interview, October 21, 2015).

Further, a situation like this requires the artists' consent, which can be problematic with a breakdown that necessitates a quick response. Indeed, the Partnership had to make their own assessment of how to handle the situation, while making sure that the artistic intention behind the work was respected; the ethical standard they used to do this was to remain within technical changes that wouldn't alter the nature of their work (P. Daigle, interview, October 21, 2015). But in this case, Meech was actually interested in the idea that the vandalism would become part of the artwork on display; he asked that the telephone not be repaired at all. In fact, he wanted the vandalized telephone booth to be shipped back to Liverpool once the deployment was over. Against the artist's intention, the Partnership dismissed the idea of leaving the telephone broken; for in their own words, 'the show must go

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on' (L. Montmarquette, interview, October 21, 2015). The Partnership also hesitated in paying for its shipping cost because, in their opinion, it was a waste of money since the apparatus was too damaged to work. Meech insisted on having it back, however, because he felt that it could be exhibited elsewhere in future as a more mature work that would broadly speak to the unpredictable character of public space: the deterioration of his work was part and parcel of his own creative process and artistic intention. In the end, the Partnership and the artist negotiated a compromise on this issue, and the booth was shipped to Meech in the UK (P. Daigle, interview, October 21, 2015).

These examples suggest that in taking on the maintenance of artworks deployed on its site on behalf of the artists, the Partnership inevitably became involved in their design. This raises a number of ethical questions related to the relationship between digital infrastructures, the artists, and the general public: How does the infrastructural approach change the relationships of power between these stakeholders? Does it provide more or less design agency for artists and end users? Does it have the potential to open up new paradigms for collaboration in the public domain? What are the mechanisms here through which stakeholders can negotiate decisions? The next and last example further examines the ethical implications of such tensions.

### ***Think Globally, Legislate Locally***

The third challenge that came up for the Partnership in the context of the Common Space project was also related to the issue of artistic license but this time, the constraint was due to differences on how laws are applied to public space around the world. The HUMAN FUTURES initiative may be an international project, but when it comes to deployments in public space, its legal frameworks remained local. Artists had to conform to the existing laws and regulations applicable within the national jurisdiction of each of its cultural partners. Some European states, for instance, do not legally forbid the display of personal device ID Codes in a public artwork. Current laws in Montréal, however, do make such an act illegal. This became an issue during the development phase of **Unintended Emissions** created by three members of The Critical Engineering Working Group: Bengt Sjölen (Sweden), Julian Oliver (New Zealand), and Danja Vasiliev (Russia).

Established in 2011 and based in Berlin, the Critical Engineering Working Group works toward raising awareness around the new ethical issues that arise in the context of ongoing technological innovations. Their mission is summarized in an online manifesto translated into sixteen languages (Oliver, Savičić & Vasiliev, 2011). Their members produce artworks and projects that call into question the top-down paradigm of technology design. For instance, to denounce the 'corporatization of the Internet', they might advocate off-the-grid and alternative DIY networks (Tremblay, 2015). Some of their members – such as Julian Oliver, a renowned activist hacker who has received three Prix Ars from Ars Electronica – have won prestigious international prizes for their controversial digital artworks.

Accordingly, many members of the Critical Engineering Working Group conceive projects that are critical of existing norms and practices. In particular, one of the themes they wish to draw attention to is how portable devices are routinely used by large corporations for data mining and geotracking purposes. Raising awareness around this matter – which they refer to as instilling a 'healthy paranoia' – was the rationale behind their Common Space artwork, **Unintended Emissions** seen in Figure 8. Here, the original artistic intent was to make pedestrians aware that personal information is being captured from their mobile devices as

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they move in the vicinity of the artwork – the main assumption being that most people emit this information unintentionally.



**Figure 8.** View of the media façade of *Unintended Emissions*, *Common Space* interactive video projections, created by Bengt Sjöln, Julian Oliver, and Danja Vasiliev, Quartier des Spectacles district, Montréal, Canada, September 28, 2015. *Source:* Martine Doyon (© 2015). Used with permission.

The graphics for the video projection proposed by the Critical Engineering Working Group consisted of a minimalistic monochrome template made up of two display screens placed side by side, on which appeared computer code, identifiers and text, moving and cascading incredibly fast (Pop, Toft, Calvillo, & Wright, 2016, pp. 378-381). Some might say that it looked like two computer screens running a program with a bug in it. Or perhaps, to *aficionados*, this is what programming code looks like as it is executed. In any case, the hacktivist style was convincing. In its test version, the graphic displays were changing so fast that they were almost illegible. Still, the ID code of each mobile device detected in the area was automatically displayed by the system programmed by the artists. The three members of the Critical Engineering Working Group were, in fact, hoping that people would recognize themselves when they would see their device ID code appear on the media façade; this was the point of the artwork. The problem that they ran into is that displaying this data publicly is illegal in Montréal.

In the end, the co-producers had to insist that the artists replace each number in the device ID codes with the letter 'X' (P. Daigle, interview, October 21, 2015). When asked how she perceived this alteration of the artwork, the *Common Space* project coordinator commented, 'the video projection was so visually busy and incomprehensible that it would have been impossible for people to understand what they were looking at anyway' (L. Montmarquette, interview, October 21, 2015).

It is highly possible that most observers would not grasp the full meaning of the artwork. But do people ever really do? Is legibility and clarity what mattered in this artwork? More

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importantly, did the work lose its purpose once the codes were anonymized with 'X' marks to satisfy the demands of Montréal's legal framework? Such questions can only be answered by conducting interviews with the artists and with the audience. This can be said in fact, for all of the examples cited in this case study. Reporting the perspective of the artists via third parties, namely the programming director and production coordinator interviewed on October 21, or while the artists spoke in person under the tutelage of the Partnership during the official Common Space public talk delivered on October 3, can only provide limited information. While the findings above might be somewhat useful to researchers, the PI found them lacking in critical depth in comparison with the research outcomes of the Mégaphone field study.

### Assessing Multidimensional vs. Unidimensional Approaches

Due to time constraints, the PI was not able to devote as much attention and resources to the Common Space study as to the Mégaphone study: the former had to be conducted in three weeks, while the latter was undertaken over three years. Upon completing the Common Space study and assessing its differences with the Mégaphone study, the PI concluded that a multi-sited methodology offers a more powerful tool – and thus a more relevant means – to support the research of urban technology designs made in the context of an infrastructural approach. While the reasons for this are multifold, the main consideration in this appraisal is that an iterative approach that takes place over the course of an extended period ostensibly affords a wider range of research strategies and more time to collect data, perform deeper analyses, and take stock of all the stakeholders' perspectives and needs.

For instance, neither the study participants, nor the artists were interviewed for the Common Space study because a few weeks is not enough time to instigate and process a research ethics protocol. As a result, the design problems that are raised only reflect the Partnership's views and interests. Drawing from different stakeholder groups – and by extension, a greater diversity of perspectives – the Mégaphone interviews could, conversely, rely on critical theory to represent some of their diverging interests; such an analytical approach arguably supports a constructionist epistemology that is more inclusive because it builds on situated knowledges 'being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context' (Crotty, 1998, p. 42). More importantly, it better reflects the *interdependency* of actors bound by distinct needs, interests, and roles. What purpose does the Partnership serve without 'end user' participation? What is the relationship between artistic intention and audience reception? How does the Partnership's responsibility over the coordination and control of a digital infrastructure circumscribe the designers' creative processes and artistic license? In describing the connections between stakeholder groups, the multi-sited ethnographer substantiates each of their individual contributions.

While a unidimensional approach focuses on the design problems encountered by one stakeholder group *vis-à-vis* others, a multi-sited design approach allows the investigator to better demonstrate that design problems are the result of different intentions and forces that are mutually constitutive of a broader sociotechnical structure. With such a tool, it is the context of design itself that can be called into question to be updated and reformed. Although this was not the research agenda of the Common Space study, it nevertheless remains a key factor when innovation and agency are the end goal because these typically come about through the push and pull of a dialectical process. While it is understood that different stakeholder groups are not, and can likely never be equally influential in shaping final outcomes, multi-sited design can position each of these groups *inside the design loop*.



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In the Mégaphone study, this was achieved by writing up case analyses in the form of short narratives that described study participants as characters carrying out acts of creative appropriation that went well beyond the baseline use that the interactive ‘Speakers’ Corner’ had been designed for. These five international conference proceedings and three academic journal articles were not only presented and published in academic venues, they were also circulated in each of the stakeholder groups over a period of a year. By sharing these essays with each stakeholder groups, the PI made the results of this design research project widely available to the micro-publics that, in effect, were legitimized as the Mégaphone study’s epistemic partners. In contrast, due to the lack of time, resources, and funding, the Common Space study yielded a cursory report describing a series of anecdotes told by a single party. Moreover, the only two potential publics that the study addresses are academia and the Partnership. When faced with logistical limitations, a unidimensional approach can provide researchers with a quick and dirty set of methods to identify a narrow design issue, but its outcome is just a *post-mortem* report.

In conclusion, the main insight of the research program undertaken in the Quartier des Spectacles from 2012 to 2015 has been the realization that a complex object of study such as a digital infrastructure – and its ancillary deployments – is best studied with a robust and far-reaching longitudinal methodology because it can provide more nuanced descriptions: a multi-sited approach wherein the ethnographer is given the possibility of developing relationships with stakeholders over time, building bridges between them through publications and events, and using critical theory to look outside the box with these epistemic partners can support the reconciliation of multiple perspectives.

### References

- Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. London; Thousand Oaks, CA: Sage.
- Daigle, P. (2015). Interview with the *Common Space* Programming Director, October 21, 2015, Quartier des Spectacles Offices, Montréal, Québec.
- Dalsgaard, P., & Halskov, K. (2010). Designing urban media façades: Cases and challenges. In proceedings of CHI’10: *28th SIGCHI Conference on Human Factors in Computing Systems 2010* (pp. 2277-2286). New York, NY: ACM Press.
- Dourish, P., & Bell, G. (2011). *Divining a digital future: Mess and mythology in ubiquitous computing*. Cambridge, MA: MIT Press.
- Forlano, L. (2006). Activist infrastructures: The role of community wireless organizations in authenticating the city. *Eastbound Journal*, 1: 49-66.
- Fortin, C. (2016). Harvesting the interactive potential of digital displays in public space: The poetics of public interaction (doctoral dissertation). Simon Fraser University, Surrey, British Columbia, Canada. Retrieved July 4, 2017, from <http://summit.sfu.ca/item/15793>
- Gazzola, H., & Baltazar, A.P. (2015). A hybrid interface for designing and building parklets. In K. S. Willis, A. Aurigi, M. Phillips, & G. Corino (Eds.), *Proceedings from MediaCity5 2015: The Fifth International Conference on the EU funded MEDIACITY project* (pp. 40-58). Plymouth, UK: Institute of Digital Art & Technology School of Architecture, and Design & Environment, Plymouth University.
- Human Futures. (2014). *Human Futures Website*. Retrieved October 22, 2015, from <http://www.humanfutures.info/>
- Koolhaas, R. (1995). What ever happened to Urbanism? In J. Sigler (Ed.), *S,M,L,XL: O.M.A. Rem Koolhaas and Bruce Mau* (pp. 959-971). New York, NY: The Monicelli Press.
- Kroll, L. (1997). *Bio, psycho, socio/eco. 1, Écologies urbaines*. Paris: Éditions L'Harmattan.
- Lamoureux, M. (2013, September 23). Common Space? Humans at the heart of technology: 13 artists, 8 works in the Quartier des Spectacles (press release). Quartier des Spectacles

## Open Access Journal

- Partnership. Montréal, PQ: Quartier des Spectacles Partnership. Retrieved October 22, 2015, from <http://www.quartierdesspectacles.com/en/media/commonspace>
- Latzko-Toth, G. (2014). Users as co-designers of software-based media: The co-construction of Internet Relay Chat. *Canadian Journal of Communication*, 39(4): 577-595.
- Montmarquette, L. (2015). Interview with the *Common Space* Project Coordinator, October 21, 2015, Quartier des Spectacles Offices, Montréal, Québec.
- Oliver, J., Savičić, G., & Vasiliev, D. (2011, October). The Critical Engineering Manifesto. Berlin: The Critical Engineering Working Group. Retrieved October 22, 2015, from <https://criticalengineering.org/>
- Pop, S., Toft, T., Calvillo, N., & Wright, M. (Eds.). (2016). *What urban media art can do: Why, when, where & how*. Stuttgart, Germany: Avedition.
- Preiser W. F. E., Rabinowitz H. Z., & White E. T. (1988). *Post occupancy evaluation*. New York, NY: Van Nostrand Reinhold.
- Tremblay, L.-R. (2015, October 3). Interactive art in the public space: The Common Space? project. Public talk presented at the Second Mutek\_IMG Forum on Current Practices in Digital Practices, Phi Centre, Montréal, Canada.
- Viau, N. (2015). Common Space? (press kit). *NFB Interactive*. Montréal, PQ: National Film Board of Canada. Retrieved October 22, 2015, from <http://epkurl.com/commonspace/>
- Williams, A., Lindtner, S., Anderson, K., & Dourish, P. (2014). Multi-sited design: An analytic lens for transnational HCI. *Human-Computer Interaction*, 29(1): 78-108.