# Small-Scale Design Experiments as Working Space for Larger Mobile Communication Challenges

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**Abstract**

*In this paper, a design experiment using Instagram as a cultural probe is submitted as a method for analyzing the challenges that arise when considering the implementation of social media within a distributed communication space. It outlines how small, iterative investigations can reveal deeper research questions relevant to the education of emerging design students choosing to enter the field of mobile communication design. Challenges of participatory design, media affordances in relationship to established taxonomies and sustainability are all a result of this research-driven design experiment.*

## Introduction

Generations of emerging designers, well versed as both active participants and/or passive users of social and mobile media, are entering a professional environment where what can be considered a competency is a continually evolving discussion. The call for a realignment of "digital," "media" and "design" literacies to accommodate this new generation are many (Burdick & Willis, 2009; Giovannella, 2012; Prensky, 2012) and for very good reasons. Saturation rates of mobile media have soared over the last decade. The space of the internet is no longer tethered to an electrical outlet, and the boundaries within which objects communicate with each other, and with us, continue to be broken and made readily available (Johnson, Smith, Willis, Levine & Haywood, 2011). And while this current student population is keenly aware of the space of social media and mobile technologies, they can often be less aware of the long tail each communication practice carries and the depths to which questions must be asked for its evolution. Emerging designers armed with the capabilities to understand how cultural shifts shape technical use are at an advantage in affecting the course of future mobile and social media communication practices.

In this paper, we use a small-scale design experiment to outline three distinct challenges for educating emerging designers entering the field of mobile communication – in particular within the space of the newly-developing field of the distributed museum (Bautista & Balsamo, 2011). The challenges discussed have arisen as valid investigative needs resulting from observed outcomes of a co-design experiment. We contend that placing emphasis on small-scale experiments is applicable across design pedagogies and provides students with a framework for conducting deeper analysis and research to discover research questions.

Designing for the distributed museum requires noticing the scales and dimensions that characterise the new museum of the 21th century. These dimensions involve a continuum from fixed, physical

and material locations to locations in mobile and virtual spaces and into a scaling of activities ranging from content access through to content production (Bautista & Balsamo, 2011). Each new space and activity carries implications for restructuring and redefining the nature of the museum visitor experience. The design goes beyond merely providing a more or less attractive medium for presenting content (Macdonald, 2007), into the implications for making content relevant within a variety of public spaces.

### Experimental design research and design education

The aim of the research-based design experiment reported from here is to explore the cultural and social dynamics, tensions and potentials that museums may meet when integrating social media in their communication and exhibition practices. In particular, when museum content is encountered in external spaces other than the physical museum space. We see potential for small-scale experiments and in-process documentation to bring forth design literacies relevant to shaping and forming the concepts around what a museum experience may mean in a distributed setting. In turn, this design research project illustrates challenges for design education in preparing future designers with the methodological and analytical competencies required to address such dynamic communication complexities and interactions.

Contemporary discourse in and around design education continues to stress the need for emerging designers to be prepared for an increasingly networked, complex and unstable information culture (Collina, 2011; Davis, 2008; Thackera, 2005). Design no longer fits within the boundaries of any one particular setting, borders are blurring across disciplines, across devices and across modes of cultural production (Danzico, 2011). Therefore, methodologies for understanding the deep-seated socio-cultural affects of technology usage will be critical for educating designers who could potentially ground mobile-driven initiatives in predisposed opinions stemming more from personal immersion rather than conscientious understanding.

Beginning with a description of the research-driven design experiment using a mobile photo-sharing platform (Instagram), we will share the results as three defined challenges we see as relevant to evolving the digital relationships between the museum and its visitors outside the context of a physical museum.

### Mobile and online media shaping the distributed museum

In museum design, a central discussion revolves around how digital media shapes the transformation of cultural institutions. Central issues within the contemporary re-conceptualisation of museums as knowledge institutions include efforts to build new relationships to society and thereby relationships with the museum visitor (Davis, 1998; Vergo, 1997). A number of concepts are used to define this transformation of visitor roles in new museum encounters; the integrative museum, the engaging museum, the participatory museum and the social inclusive museum. Contemporary explorations into the possibilities of integrating social media and mobile technologies to create new forms of visitor relationships do align with these longer institutional transformative processes. Social media is embraced as a feature capable of taking the conversations beyond the museum and integrating multiple "voices" (Black, 2010). While these media provide multivocality and new forms of re-mediation, they also recast well-known questions about control, authority, ownership, voice and responsibility (Knell, 2003; Russo, Watkins, Kelly, & Chan, 2008; Stuedahl, 2011; Stuedahl & Smørdal, 2011a) as museums can be ambivalent to practices of computing (Parry, 2007). New museum paradigms related to digital technologies offer not only opportunities for reimagining interactions within a physical museum space, but allow for affordances that can be found within taking the museum beyond the walls and grounds of its physical location (van Mensch, 2005) into a distributed space.

Handheld technologies have long been used for guiding and giving access to additional information sources in museum exhibitions (Aoki, Grinter, Hurst, Szymanski, Thornton, & Woodruff, 2001; Filippini-Fantoni & Bowen, 2008; His, 2008). More recently, mobile phones

have been embraced as a method to enhance museum learning by experiencing documentation processes (Hsi, 2002; Vavoula, Sharples, Rudman, Meek, & Lonsdale, 2009; Walker, 2008) or to enhance co-compositions and the sharing of photos (Konstantinos, 2005; Stuedahl & Smørdal, 2011 b), allowing for a restructuring, contextualisation and personalisation of a museum visit (Kahr-Højland, 2011). Some museums are currently exploring smart phones, iPads, augmented software and apps as mobile guides for outdoor experiences to provide content from collections and archives into new contexts, such as fairs and events (e.g. Stejdelike museums ARtours), and as part of city guides (e.g. Streetmuseum by Museum of London), where images from the museum collections are showcased by way of GPS-coordinates.

Mobile phones have also enabled amateur image making, or "Photography 2.0" practices, to expand the dominant museological narrative (Galani & Moschovi, 2010). Photography-based social media applications such as *Tumblr*, *Instagram* and *Pinterest* have allowed museums to build new relationships with online communities of interest through imagery (Colquhoun & Galani, 2013). The focus on photographs has emerged in studies on museum visits, where photo taking via Instagram has been defined as a new visitor practice in exhibitions (Hillman, Weilenmann & Jungselius, 2012) while projects related to the photo sharing database *Flickr* (Dalton, 2010) explore the dynamics of social tagging and folksonomies related to museum art collections (Trant, 2009). This includes crowdsourcing actions of correcting, contextualising, complementing, co-curating and crowdfinding of photographic historical content provided by cultural heritage institutions (Oomen & Aroyo, 2011).

While mobile media opportunities to foster social connectivity and re-encounter experiences beyond the visits are welcomed, very few museums have used mobile media to explore these as the means to build sustainable visitor relationships (Wasserman, 2011). Current crowdsourcing and community projects primarily translate into participatory activities of co-creation, contribution and collaboration (Simon, 2010), or as invitations to engage in tasks that increase the quality of a museum collection (Colquhoun & Galani, 2013; Oomen & Aroyo, 2011). There are few studies on what motivates visitors in mobile, virtual communities and how the relationship to museum content is established outside of known museum contexts. There is also a growing need for museum design language and methodological approaches (Wasserman, 2011) that may connect to people`s sense of ongoing presence and emerging conventions of interpersonal relationships (Licoppe, 2004; Ling, 2008) with mobile technologies.

### *Introducing participatory design approaches to the distributed museum*

Yet, several design-related perspectives across museum communication design do highlight the situated experiences unfolding in social interaction while using digital technologies during museum visits (B. Brown, Chalmers, Bell, Hall, MacColl, & Rudman, 2005; Economou, 2004; Galani & Chalmers, 2002; Vom Lehn, Heath, & Hindmarsh, 2001). Within fixed and located museum exhibitions, the physical nature and material qualities, the sensory characteristics and cultural identity of the site as well as the digital layers of the virtual involved, are identified as assembling contextually to impact how a visitor interprets an exhibit or a site. The social and material aspects of such located museums exhibits are seen as grounded in the experience of place and the lived experience of the physical world in the museum, and have been explored in earlier HCI and CSCW research at the personal, social, cultural and physical levels (Ciolfi & Bannon, 2005; Ciolfi & McLoughlin, 2011; Tuan, 1977). These categories are relevant for designing experiments for museum communication that move outside of the museum building to establish new forms of social, personal and cultural encounters of the distributed museum.

In this way, museum communication is emerging beyond historically known visitor relationships and therefore in need of increased integration of research methodologies. Designerly inquiries (T. Brown, 2009; Cross, 2001; Nelson & Stolterman, 2003; Stolterman 2008), research, and investigations through design experiments can provide a methodology for museums to further develop their mission of engaging visitors with contemporary communication practices. We see

the potential for such connections to be further explored – and for the case presented here, in the everyday context of interrupting communication within the contemporary city via content from the past.

A broad range of design methods has been developed (Sanders & Stappers, 2008) to address the need to understand everyday cultural and social practices with digital technologies in research-based design. Two approaches that have grown out of the participatory design (PD) and co-design experiments in Scandinavia, *Design Labs* and *Living Labs*, are relevant for building a participatory framework for design experiments related to mobile, fluid, open and scaled spaces of the distributed museum. The framework of a Design Lab is that of a controlled environment for executing prototype experiments (Binder & Brandt, 2008) and as a structuring tool for participatory enquiries in transparent and delimited processes that are scalable (Binder, 2007). Whereas Living Labs are a means to establish physical spaces or virtual realities where stakeholders may co-create, explore, experiment and evaluate design concepts and ideas in everyday situations (Følstad, 2008; Näkki & Antikainen, 2008; Westerlund & Leminen, 2011). These two traditional PD methods are now challenged by movement towards understanding innovation processes as dependent on collaboration over time and among many stakeholders (Björgvinsson, Ehn & Hillgren, 2010).

These two PD frameworks were combined in our design experiment as methods to understanding how distributed museum content can relate to existing mobile social media practices in the context of a city; allowing the PD approach to position the design experiment as a provider of democratic entry into museum innovation. Within this framework, the social photo sharing app Instagram was employed as a design probe (Gaver, Dunne & Pacenti, 1999; Mattelmäki, 2006) and thus as a mediated platform for PD (Reyes & Finken, 2012) to explore variables of cultural and social mobile practices, specifically photosharing. The design experiment described below critically explores the practices of the distributed museum by turning the question of participation around. Asking how historical content of the distributed museum may participate in ongoing communication practices of people within the contemporary city.

### The Akerselva Digitalt project[1]: advancing the mobile guide

The Norwegian Museum for Science, Technology and Medicine indexes the industrial heritage of Norway. Together with Oslo City Museum and Oslo City Archive, they embarked on a project with the objective of establishing a mobile guide for walks along the Akerselva river in Oslo: a place where the buildings and sites that lie along its path are central to the industrial history of Norway. While today the walkway along the river has the characteristics of being a place for recreation, stories of the central cultural, economic and societal transformations in Norwegian society over the past 150 years are also present. To date, this history has been communicated through city walks, online portals with documented industrial history, and in text books. Most recently, a mobile guide that will transmit content via audio location specific mp3-files accessible by smartphones at various locations along the river is being developed. As an extension of this guide, the participating museums invited the researchers to explore how visitors can be involved in participatory and social activities through the mobile guide – and how visitor contributions can be integrated in concert with museum-produced content.

In investigating what kinds of participatory activities groups of users and visitors along the Akerselva River may find meaningful, the research team developed an approach that consisted of both a social-media component and a physical installation within a co-design framework. It was decided that a small-scale experiment with an operable prototype, would allow for critical reflection upon which a deeper set of research questions could be developed to identify the strengths and weaknesses of a socially-driven mobile platform with the intention of leading to new museum interactions in the setting of the river.

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[1] http://www.uv.uio.no/iped/english/research/projects/contact/trango/Akerselva%20Digitalt/

***Digital Design Set-up: Instagram for social sharing of historical museum content***

Beginning investigation into the presence of Akerselva on social media revealed the Instagram photo stream, #akerselva, where citizens seemed to share natural as well as social and culinary experiences. Therefore, the first investigation centred on using Instagram as a distribution channel for historical images within this already established mediated relationship. Images for the experiment were curated from the open photo database *oslobilder.no* provided by the Oslo Museum, and the portal *industrimuseum.no* provided by the Norwegian Network for Industrial History. We established a new Instagram stream, @akerselvadigital, to allow people the ability to follow these curated archival photos.



*Figure 1.*    @Akerselvadigitalt photo stream on Instagram

The decision to publish historical images was an investigation into processes in which the museum content could fit into ongoing cultural practices on Instagram. The photos were published with excerpts from the museum source data accompanied by a sentence providing historical context for the image. The photos were also published with the name of the photographer, the year, the owner of the archive and the digital source. One example, from the Seilduken factory from 1884, stated that 30-40% of the industrial production along the Akerselva was executed by children.

*Figure 2*. Photos from the archives published through Instagram

All photos were tagged with the #akerselva hashtag, and with clusters of hashtags that drew attention to themes related to Akerselva history. The themes could be related to:
a. place, such as #seilduken, one of the main factories; and,
b. historical phenomena, such as #children work or #osloactivism, #politicalprisoners; and,
c. current events, for example, #vulkanoslo (the burgeoning environment for creative industry in Oslo).

Hashtags became a semantic tool for both outreach and a potential prompt to trigger historical reflections. They allowed a mediating of the relationship between historical images and current ongoing cultural and social activities. Alonf with the images, the hashtags could provoke reflections directly onto historical issues.

### *Physical installations along the river walk event*

To observe how the situated use of Instagram may play out in connecting the historical content to a physical context in the city, the research team arranged for installations across three sites along the river. The goal of the physical set-up was to explore how visitors experience the media-based dynamics of Instagram related to place. It was decided to carry out the installation during the yearly riverwalk, or *Elvelangs*, that occurs on evening of autumnal equinox. This event is a very stimulating evening that gathers up to 3000 people of differing ages participating in various cultural exhibits and performances along the river.

The three installation sites (see Figure 3) were defined according to the relevance of the content and the physical accessibility in relation to the number of people taking part in the walk. Being a physical area for pleasure and leisure time while at the same time having multiple histories of working class, women's history, immigration, gentrification e.g., each installation site addressed a theme derived from historical narratives related to that specific location. These included:
• women`s work related to the canvas factory that today houses Norway's largest college of higher education in the field of the arts (#Seilduken);
• cultural activities and musical activities in the late 19th century, a former textile production facility that now serves as a locale for concerts, art studios and a hip-hop youth club (#Brenneriveien and #Blå);
• citizen activism located at Anker bridge, a site for events such as the Hunger March of 1932 focusing on unemployment and workers' social conditions (#osloaksjonisme).

*Figure 3*.      One of the three installation sites. iPads were available for viewing the photo stream in real-time (left), with cards containing text prompts to encourage interactions by way of the QR codes.

Printouts were made of the @akerselvadigital stream photos, scaled 200%, and marked with a QR code. These printouts were then laminated for durability and strung at the specific site relevant to each theme. The QR-codes on the laminated printouts linked users directly to the Instagram stream, making an onsite connection between the physical site where the event occurred and the digital space being curated on Instagram. Accompanying text and questions were intended as trigger points for reflection over contradictions between the past and now. In inviting river walkers to access by way of QR-codes, we hoped to provide an incentive to participate by adding their own photos or comments stimulated by the prompting texts.

It was important to also provide access to those who did not carry a smartphone with Instagram. For this, iPads were wired and strung across the three sites allowing for the same access to the stream of photos from @akerselvadigitalt. Therefore, in each of the three installation points, there were 10-12 laminated historical photos digitally-enhanced to replicate the Instagram image strung across the space, an iPad allowing for instant access to the @akerselvadigital stream on Instagram and a researcher who acted as a silent observer of the activity.

### Akerselva experiment observations

The installation was accessible during the entire three hours of the riverwalk event and remained up for some days after (minus the iPads), in the end gaining around 50-60 new followers to the @akerselvadigital stream on Instagram. We found that the sites chosen for each installation were important in regards to awareness, attention and dwelling time. People were intrigued by the blending of the historical photos with instant snapshots from contemporary situations at the riverwalk that appeared together in the Instagram feed. More comments and "likes" were given to the published photos that had an open description – while no-one answered the prompting questions or responded to the requests to contribute.

*Figure 4.*     The most popular installation site of the three locations

It became clear that defining the features for participation had to be explained differently for both the digital and physical spaces. The physical translation of the Instagram photos on to laminated cards seemed to require more descriptive text and a clearer prompting to act than the photos that were experienced within Instagram on the mobile phone. The physical text had to be designed with a clear idea of what kind of contribution people could make that was relevant for their situated context of the walk – and how the user-made Instagram contributions would fit within the museum framework. People participating in the walk constantly uploaded photos of installations and situations experienced and hashtagged with #akerselva, making it difficult to find ways to tune them into historical reflections in this context. The requests articulated in our Instagram entries did not work well in crossing contexts between online and physical representations. And it seemed that translating the Instagram photo and hashtag texts into a physical form required another level of prompting – a physical invitation which set out verbatim instructions on what the user was to do in the interaction.

## Design Experiments as methods to explore challenges

In assessing an outcome for participation along the river, the social-sharing app of Instagram was chosen over other relevant social-media options as it differs from web-based hybrid databases such as Flickr, that have been used in present museum, library and archive commons-based projects (Colquhoun & Galani, 2013). In employing Instagram, we opened a space for a participatory and experimental approach that examines equally the levels of personal, social, cultural and physical interactions with the Akerselva River. In this way, we used an interventionist ethnographic approach to establish a design lab in a living context of the city. The personal, social, cultural and physical levels of place-based experiences are relevant frameworks through which the process of not only questioning the context and intention is brought forward, but also addressing the user experience of physical interaction with museum content in the city. Our design experiment gives some indications on the role of content in locational experiences related to the continuum between physical place and online space that requires further exploration. Our finding was that sense-making in social media-driven communication platforms within the context of the distributed museum are less about the devices themselves and more about the social and cultural activities that are performed with, around or through them as part of a mediated process. To this end, we have

identified three key design challenges that have arisen as a result of the Akerselva design experiment. These challenges in turn suggest literacies needed in approaching the design of mobile communication practices within a distributed museum.

### *Participatory methods: exploring mobile social media participation in the city*

There is a fundamental change in how a sense of place is now experienced through technologically media-moderated communication (Malpas, 2012). Such activities are driven by cultural dynamics that can be described as unstable at best. There is no valid prediction method for determining what type of engagement will have lasting legacies. In advancing the concept of the Akerselva guide as a socially and culturally mediated, spatial and temporal based experience, the project will need to ask questions of intention and outcome of use, in order to determine the next appropriate iterative path to follow. Intervening by adding museum content in existing Instagram-streams, we enlisted design probes as a means of breaching experiments for exploring ongoing cultural practices. These are inspired by the methods introduced by Garfinkel and Goffman[2] where breaks into small, everyday rules are used to understand the psychology of social systems. By using a breaching approach to PD, the design team were the participatory actors and the existing cultural practices in Instagram, the established design space. By turning around the question of who participates in what in the design experiment, we had to realise that the design space is given – and we as designers had to think about ways we can participate in the ongoing activities of imagery creation and documentation activities on Instagram and within the city. The breaching design action had to follow the rules of publishing, liking and following – and could therefore only exist in this experiment as interventions that break with ongoing cultural practices through the introduction of thought provoking text and images that pointed to the historical contradiction of the place.

### *Museum content across contexts: Tensions between folksonomies and museum classification*

In Instagram, we encountered a challenge in translating and connecting the museum's institutional metadata with the existing folksonomies that were connected to place in Instagram. Mixing social tagging and folksonomies with the structured metadata of an institutional classification system has become a major discussion as institutional cultural memory content then mixes with the social processes of online museum communities (Dalton, 2010; Trant, 2009). Studies of museum crowd-sourcing photography projects involving amateur photos show that these forms of integration may transform the authentic photos into curatorial frameworks, stripping the amateur imagery of its unique spontaneity and subjective context (Galani & Moschovi, 2010).

In this experiment, the mixing of curatorial content into everyday amateur content arose as a potential challenge when hashtagging was used as a means to build relationships between the mobile space, the museum content, and a user's situated placemaking practice. Thereby making us aware of the semantic power of the hastags and the need for a design awareness that was deeply informed by an ethnographic study of the patterns of use within the assignment of hashtags, and what those patterns reveal as far as perception and understanding of the subject. Such awareness may make way for the cultivation of a classification system that could bridge the gap of institutional metadata and the folksonomies associated with social media consumption.

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[2] This refers to Harold Garfinkel's defining of *ethnomethodology* and Erving Goffman's work in *dramaturgical sociology*.
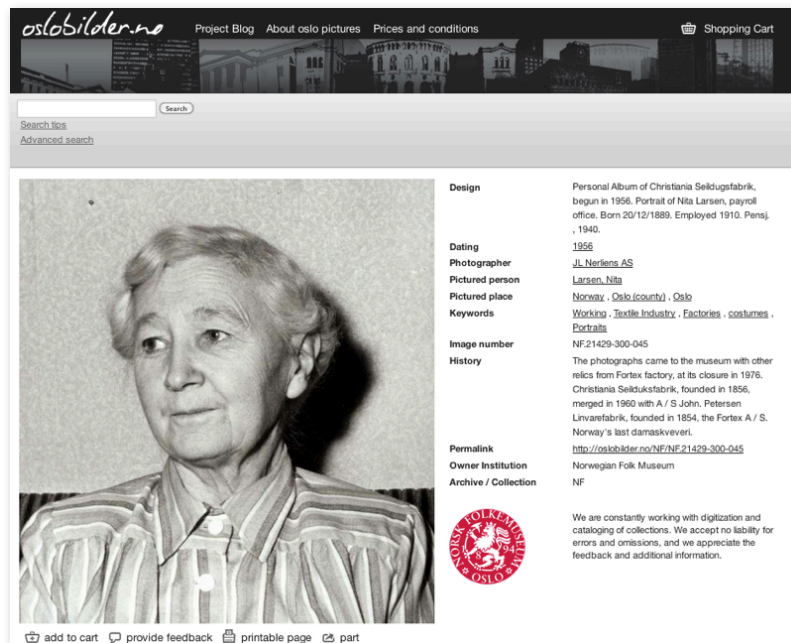
*Figure 5.*     Website from which historical data must be translated to parse into social media affordances

### Sustainable outcomes and lasting legacies

Museums have been keenly aware of sustainability for decades; knowing that a science exhibit that once served for novel and curious engagement for the visitor can slowly, or even quickly, fade into the backdrop. Sustainability practices remind us that we cannot implement an outcome without considering its technological shelf life. Within the sphere of the distributed museum, the concerns of such sustainability become multifaceted. This is a continued evolution that includes sustaining interest in maintaining the relationships once the excitement of an initial launch is executed and the technology moves forward. Choices of application interaction, such as the ones made in our project with Instagram, will continually need to be readdressed and re-evaluated by design in order to make decisions that will lead to prudent use of the technology in the quest to provide value and knowledge as a viable outcome (Prensky, 2009). The livelihood of hardware can be measured by sales whereas the livelihood of social media is quite often measured in "likes" and "clicks."

The Akerselva experiment was born from an investigation into methods of creating sustainable relationships with museum visitors using social media. However, in a world where social media is being used to capture historical events in real-time, what becomes of content generated via participation needs to be a vital part of the sustainability conversation. It opens up larger questions of how collective memory building will be housed, archived and studied in the future context of a museum collection. Ability to conduct analysis and critique of the underlying cultural infrastructures of technological engagement, the meaningful experiences and deeper understandings of potential participation fatigue, use, content, and place are inevitable to understanding how to best design for mobile and social interactions in future.

## Conclusion

Emergent designers, defined as entering the field from the recent completion of undergraduate or graduate coursework, are well-versed in digital literacy and easily at home in the roles of both active media contributor and passive media spectator. However, the design literacies needed to work in a more meaningful manner within this arena are constantly evolving. It is not enough to

assume competency from one's own everyday practice of engagement with social media. It is the role of design education to help design students develop a multidisciplinary understanding of how cultural shifts shape technical use. The *Akerselva Digitalt* design experiment foregrounds three such competencies including: the understanding of participatory design as an interventionist action; the use of ethnographic research to result in stronger application of media affordances within a distributed space, and the long lenses of technical and content sustainability. Each competency presents new challenges for design education in preparing for future engagement of content within increasingly complex and unstable mobile and social information cultures.

By framing an investigation within the context of a design experiment, there is an opportunity for more reflective analysis as a result of a hands-on and real-time exploration of the content. Physical small-scale experimental installations can not only identify immediate physical and socio-cultural parameters, but also make apparent larger questions and investigations towards advancing the concept of mobile communication. The development of new and relevant research methods, ones that extend beyond the novelty of interaction between content and technology into deeper explorations of cultural patterns, hold potential for influencing the future of communication practices within distributed museum spaces.

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