FRAMING PRIVACY

Architectural Representation in Digital Spaces

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Copyright Statement

I RESEARCH ABSTRACT

Framing Privacy: Architectural Representation in Digital Spaces

Individual privacy can be compromised in digitally mediated spaces, as networked communication has made scales of interaction and degrees of visibility difficult to grasp. This inquiry argues that privacy is a spatially-conditioned mental construct and tests architectural representation as a means of orienting the individual online through spatial design practice on three scales, from the miniature to the room and the neighbourhood.

Framed by the methodology of architectural representation, privacy online offers the narrative hook and driver for research. This identifies principles underlying architectural practice that can contribute to understandings of digital spaces of interaction, such as online social networking platforms, from the point-of-view of a designer-researcher. The research has been developed under the umbrella of the Creative Exchange, a national AHRC-funded knowledge exchange hub enabling interdisciplinary and inter-organisational collaboration between academia and industry.

Asking how different scales of architectural representation can help to orient the individual in digital spaces, 'methods of spatialisation' aim to render tangible and experiential a range of observations of the digital; they result in miniature artifacts, immersive installations and interactive hybrid digital-physical platforms. Through methods of inquiry, including Donald Schön's methods of reflective practice and the 'design situation', these operate as a lens on to the digital. Instead of aiming to reconceptualise privacy itself, it is considered as

symptomatic of the challenges brought about by digital spaces, and informs means of evaluation.

The original contribution the research makes to knowledge in the field of design research at the intersection of architecture and communication design lies in adapting architectural representation for digital contexts: it develops approaches rooted in architecture and aims to frame them for interdisciplinary design contexts engaging with digital spaces. The resulting framework brings together the key foundational architectural parameters of scale, distance and time, and three design methods of spatialisation: miniaturisation, immersion and mapping. These help to reframe challenges of digital communication – such as privacy online – from the perspective of the designer-researcher.

Through the practice-led inquiry, digital settings that are not easily grasped intuitively are framed as new contexts for architectural expertise, helping to establish the efficacy of architectural representation in addressing challenges of the digital through reflective design processes.

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III PREFACE

This research presents a practice-led investigation into the orientation of the individual within digital spaces of interaction. As an architect-trained designer, I have over several years cultivated an interest in the relationship between physical spaces and the sphere of online interaction, explored, for example, through my postgraduate dissertation. While a Research Associate at the Helen Hamlyn Centre for Design, I developed strategic ways of eliciting and responding to individual needs in physical environments, introducing me to research that spans institutional and organisational contexts.

The institutional contexts of The Creative Exchange (CX) and the School of Communication at the Royal College of Art (RCA) have had a strong impact on the research presented in this thesis: the CX provided a useful platform for developing my interest in enhancing how individuals relate to the world around them further, bringing together opportunities for collaborative research and a focus on 'Digital Public Space'. Funded by the Arts and Humanities Research Council (AHRC), the CX was one of four Knowledge Exchange (KE) Hubs for the Creative Economy in the United Kingdom, situated between lead institution Lancaster University, Newcastle University and the Royal College of Art in London; the overall project came to a conclusion in 2016. Fostering collaboration between academia and industry, the model for exploring mechanisms of knowledge exchange tested by the CX was centred on 21 doctoral researchers, developing a broad range of projects with other academics and partners in the creative industries.[1]

1 The four KE hubs have been reviewed in a further report that compares the range of approaches taken. The CX was the only hub that placed doctoral researchers at the centre of the exploration into mechanisms of knowledge exchange; see Senior (2016) and The Creative Exchange (2015).

While individual researchers developed their own stance on the hub's thematic focus of 'Digital Public Space' (Myerson 2015), it provided common ground for exchange, offering a frame for overlapping and complementing individual research agendas, as well as for collaboration on a range of projects. In the context of my own research, the notion of a 'Digital Public Space' offers a constructive counterpoint to the reconceptualisation of privacy online through spatial design practice, especially with regards to the sharing of personal content and the 'public' visibility of individuals in digital settings. Instead of working with the notion of a single 'Digital Public Space', I have considered spaces of interaction as a range of settings – both digital and physical – that present challenges to the orientation of the individual.

Further to the context of the CX, being embedded within the growing research culture of the School of Communication at the RCA presented constructive opportunities and challenges. Characterised by researchers from a range of disciplinary backgrounds, this environment has encouraged me as an architect to closely examine and clearly articulate principles of architectural practice and to investigate what qualities of architectural representation might transcend disciplinary boundaries. The resulting approach to research challenges conventional methods of architectural representation and formulates and tests a set of 'methods of spatialisation' that focus on underlying processes of architectural representation and how they manipulate the object of research.

IV ACKNOWLEDGMENTS

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Author's Declaration

During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

Signature:

Date:

1 INTRODUCTION

This thesis presents a practice-led investigation into architectural representation as a means for designers to negotiate the abstract realm of digital spaces. Responding to misgauged scales of interaction and challenges to individual notions of privacy online, the starting point is a concern for individual orientation in digital spaces of interaction.

The research process has been framed by The Creative Exchange (CX), an AHRC-funded Knowledge Exchange Hub, enabling interdisciplinary collaboration across academia and industry. The methodology of architectural representation underpins the research process, in which three architecturally-informed 'methods of spatialisation' give rise to six projects, which render tangible observed dynamics of digital spaces and are reflected upon in their capacity to operate as thinking devices, or a conceptual lens onto the digital. Each scale of project focuses on challenging a particular foundational architectural parameter: 'scale' in the miniature, which deploys the method of miniaturisation; 'distance' in the immersive room, emerging from the method of immersion; and 'time' on the scale of the neighbourhood, using the method of mapping.[2] The parameters initially emerge from the review of the literature, and are identified as underlying architectural representation, as well as being at the heart of the challenges of the digital this research concerns itself with; they are manipulated by means of the design methods of spatialisation.

The outcome of the research is an architecturally-informed framework for design in association with the digital, which reorients the 'designer-researcher'

2 While each scale foregrounds one of the parameters, all of them are at play in each of the projects, as outlined in detail in Chapters 3 and 4.

(Findeli, Brouillet, Martin, Moineau & Tarrago 2008) in interdisciplinary and interorganisational contexts of practice. The framework is the vehicle to render accessible to a wider design audience underlying principles of the framing and distancing capacity of architecture and its ability to work across scales in order to counter the disorientation of the individual online.

The title 'Framing Privacy' refers to the capacity of architecture to frame individual experiences and the underlying ambition of the research to contribute to better understandings of individual privacy when online; the subtitle 'Architectural Representation in Digital Spaces' describes the methodological approach this research takes: architectural representation relates to the 'framing' of the title, while 'privacy' is the exemplary condition of 'digital spaces' that drives the investigation. In 'framing privacy', this thesis initially accuses 'privacy' of being the culprit in misconceptions of digital spaces. Through the process of research, however, it will develop approaches for putting on trial other delinquents like it. As is familiar in case law, through the investigation of privacy online, the thesis offers a precedent for future trials, to be conducted by others.

This first chapter of the thesis introduces the challenges that have driven the practice-led investigation, introduces aims, objectives and research questions, as well as presenting the focus and limitations of the inquiry.

1.1 RESEARCH CONTEXT

Inherited notions of individual privacy are challenged in mediated interaction, as scales of interaction and degrees of individual visibility are difficult to gauge (Fig 1). The social web is predicated on sharing and relies on the capacity of communication technology to store and forward information, potentially amplifying content with unintended consequences (boyd 2014;[3] van Dijck 2013; Fuchs 2014; Papacharissi 2011; Papacharissi & Gibson 2011; Ronson 2015a; Ronson 2015b; Trepte & Reinecke 2011). Social media mishaps on networking platforms, such as Facebook and Twitter, have become a familiar phenomenon and disruptions of notions of privacy online are brought to the surface intermittently in the press:[4] from an expat banker in Singapore who had to effectively exile himself and his family to Australia after a series of ill-judged remarks about Singaporeans on social media had gone viral (Tadeo 2014), to the life of a woman taking a dramatic turn in the space of a flight from London to South Africa, during which a tweet of hers reached a large online audience she had not anticipated. While Justine Sacco was offline, her remark about contracting AIDS in Africa reached a global audience ready to retaliate, resulting, amongst other consequences, in her losing her job (Ronson 2015a; Ronson 2015b).

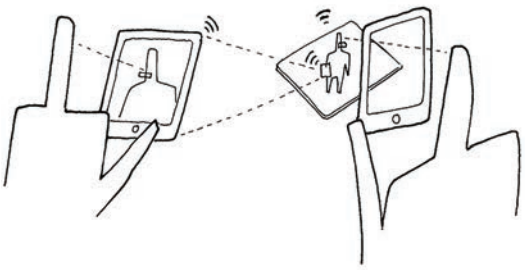


Fig. 1: Digitally-mediated interaction makes degrees of visibility difficult to gauge

Such examples of incidents involving online social media illustrate challenges to notions of privacy in everyday life; they help to highlight the disorientation of the individual in digital spaces and the difficulties in grasping the scale of online environments: the store-and-forward capacity of networking platforms makes content accessible retrospectively, shifting audiences and poten-

3 The author consistently spells her name lower-case.

4 Social media platforms are discussed here as a general group of communication systems. The focus is on dynamics that impact inherited notions of privacy and enable connections to be made to architectural framing in analog settings. For in-depth studies of online social media, see for example van Dijck (2013), Fuchs (2014), boyd (2014), Papacharissi (2011) and Trepte and Reinecke (2011).

tially resulting in high degrees of visibility online, often without the individual's awareness (boyd & Ellison 2008; boyd 2011; Trepte & Reinecke 2011); contexts of interaction online are fluid and, crucially, it is difficult to gauge scales of interaction. Further, even if scale of individual reach is understood, public visibility may result in unintended consequences.[5]

Creative art and design practices are developing critiques that focus predominantly on anonymity and secrecy as means of countering violations of privacy; some examples are presented in Appendix 1. Further, shifting notions of privacy are of concern to the social sciences, as noted above, from a legal point-of-view (Solove 2009; Nissenbaum 2010) and with regards to data privacy (de Cristofaro & Murdoch 2014; Enserink & Chin 2015). Constituting the central thematic driver for this practice-led inquiry, 'privacy online' is understood in contrast to 'online privacy' as a concern largely of data privacy,[6] where the adjective 'online' is a qualifier of privacy. Instead, 'privacy online' can also be read as 'privacy, now online', or 'privacy, but online', reflecting the notion that privacy – as an inherited concept that has long been established in analog settings of interaction – has been transposed into the digital realm, leading to disruption and misunderstandings (Keen 2012; Scott 2015).

The 'challenges of the digital' referred to throughout this thesis are understood as situations, in which inherited and intuitive expectations, borne out of the experience of analog contexts that precede digitally mediated experiences, are disrupted, as the examples in this sections illustrate. As a new *container* for interaction, expanding the familiar spatial repertoire of spaces of interaction that architecture provides, 'the digital' is considered as an accumulation of digital *spaces*.

5 boyd notes: 'Scalability in networked publics is about the *possibility* of tremendous visibility, not the guarantee of it. [-] The property of scalability does not necessarily scale what individuals want to have scaled or what they think should be scaled, but what the collective chooses to amplify.' (2011: 48; original emphasis)

6 See, for example, Martin Enserink and Gilbert Chin in their introduction to a special issue of *Science* magazine under the title of 'The End of Privacy' (2015).

1.2 PROBLEM STATEMENT

Relationships are difficult to gauge in mediated interaction and online social networking platforms pose challenges for the individual in successfully navigating online realms of interaction: a lack of intuitive understandings of scales of interaction and degrees of visibility risk causing disorientation and can lead to unintended consequences for the individual.

Architecture frequently has been used to connote the digital through metaphor, such as chatrooms and windows; however, this does not allow for nuanced consideration of the shifts to the positioning of the individual in interaction with others, that have been brought about by the digital age. This thesis understands privacy as a quality of interaction and argues that architecture – as a core design domain concerned with framing interaction in physical spaces – has not yet found adequate means and a coherent foundation for responding to the ontological challenges the digital presents for the individual. In order to reconsider contemporary challenges of the digital from a designerly point-of-view, it is necessary to identify holistic approaches and strategies, rather than merely designing for problems retroactively.

While current notions of privacy have emerged out of the architectural framing of interaction in physical spaces, relational understandings of interaction do not translate easily into digital spaces of interaction: high levels of visibility and large scales of interaction online are reminiscent of the challenges experienced in the modern metropolis at the beginning of the previous century (Simmel 1903/1969), and again demand strategies for better orienting the individual within increasingly complex social contexts.

1.3 AIMS AND OBJECTIVES

Privacy is exemplary of broader shifts in understanding of the individual's position within digitally mediated interaction. The conception of privacy as a quality of interaction in concert with distance relations and orientation is key to this inquiry.

Driven by the aim of better orienting the individual online, the key objectives are to investigate and test the efficacy of architectural representation in addressing challenges of digital spaces and to build a foundation for design in association with the digital through a practice-led approach.

The design domain of architecture – charged with the framing of experience – presents a rich theoretical understanding of spatially-conditioned notions of privacy, as well as an arena for design to challenge the problematic framing of interaction in online settings. The research aims to harness opportunities for practice-led research to learn from the framing and distancing capacity of architectonic space through testing them in practice, asking questions about the orientation of the individual in digital spaces; the individual here is both the user and the designer of space.

Benefiting from principles of architectural theory and practice, the research identifies underlying and transferable principles of architectural representation and engages with the object of research by manipulating these in a range of design projects. The practice-led inquiry is

> concerned with the nature of practice and leads to new knowledge that has operational significance for that practice. The main focus of the research is to advance knowledge about practice, or to advance knowledge within practice. (Candy 2006: 3)

As Nigel Cross notes, design knowledge resides in the 'study of the process-

es of design, and the development and application of techniques which aid the designer' (1999: 6);[7] instead of the 'spatialisations' as outputs of the design process presenting the embodiment of design knowledge, the epistemic process of 'research through design' (Cross 2001; Findeli et al. 2008; Frankel & Racine 2010; Frayling 1993/4; Friedman 2008) tests the efficacy of principles of architectural representation in association with the digital and thus aims to provide design with a foundation for engaging with the challenges of the digital by means of design practice.

The research orients familiar principles of architectural representation towards the digital and provides an architectural lens onto intangible online spaces of interaction by means of a range of spatial design projects that aid the consideration of relational challenges in digital spaces.

7 It is worth pointing out that the work presented here spans two of the three knowledge cultures discussed by Nigel Cross, who contrasts those of science, art and design (1999); while art focuses on human experience, founded on values of reflection and subjectivity and relying on the intellectual skills of criticism and evaluation, design concerns itself with the artificial world, is founded on imagination and practicality, and requires and enhances the intellectual skills of modelling and synthesis.

1.4 RESEARCH QUESTIONS

The research sets out to address the following question:

How can architectural representation help to orient the individual in digitally mediated spaces?

The 'how' points to a focus on practice and emerging strategies for designers, who constitute the target audience of the research. This question reflects the initial research impetus regarding shifting notions of privacy online and forms a key part of the appreciative system in processes of reflection. The emphasis in responding to this question is on me as the reflective designer-researcher within new contexts of practice. A secondary question drives the practice-led inquiry:

How can architectural representation benefit designer-researchers in addressing conceptual challenges of interaction in digital spaces?

This question focuses the practice-led inquiry on underlying processes of architectural representation and the nature of practice. This is key especially due to the interdisciplinary and interorganisational contexts this research is situated within. The underlying aim of the research is to identify and clearly articulate the nuanced strengths that architectural practice might bring to design research in association with the digital.

1.5 FOCUS

The research presents a study, not of digital space itself, but of the principles underlying architectural design practice that are transferable to designerly considerations of online spaces of interaction.

The thesis comprises 'objects of research' on two levels; the use of this term therefore is context-dependent. In discussing the testing of methods of spatialisation in the context of individual design projects, the object of research problematised through spatialisation is also the object of representation, namely privacy online and challenges surrounding the orientation of the individual in digital spaces. In talking about the overall practice-led research, however, in which individual projects constitute stepping-stones in the development of the framework of architectural representation, the object of research is architectural representation itself, and the ways in which it might be able to engage with the abstract challenges of the digital. Overall, the research focuses on architectural representation as the modus operandi of architectural practice and the object of research. This is tested through application to privacy online as the object of representation.

The research does not present an in-depth study of digital spaces and privacy online, and instead considers a range of facets of the digital through the lens of architectural design practice. Remaining at a conceptual level, the inquiry moves between a range of phenomena observed in digital environments that are of interest from a spatial point-of-view. Moving from 'importing' ideas and practices from other fields (Troiani & Ewing 2014), architecture here is put forward as an 'exporter' of ideas. The terms 'importing' and 'exporting' are useful to clarify my position in this process of practice-led research as both designer and researcher and to limit the scope of inquiry: the exploration of and through my own architectural design practice is focused on the identification of transferable principles of architectural representation and on their

framing for the benefit of practitioners engaging with the challenges of the digital from and across a range of disciplinary angles.[8]

Privacy remains a key theme throughout the design projects at the centre of this research. However, it is not the focus of research, which instead concentrates on process and methods: 'design practice is brought to bear on situations chosen for their topical and theoretical potential' (Gaver 2012: 937) – in this case privacy online. This research contributes to the field of design research at the intersection of the domains of architecture and communication design. While it does not aim to solve the challenge of privacy itself, it might be read by other researchers interested in privacy, who might take the thesis further.

8 Human geographers Barney Warf and Santa Arias use the terms 'importer' and 'exporter', arguing that human geography has undergone a similar shift (2009: 1).

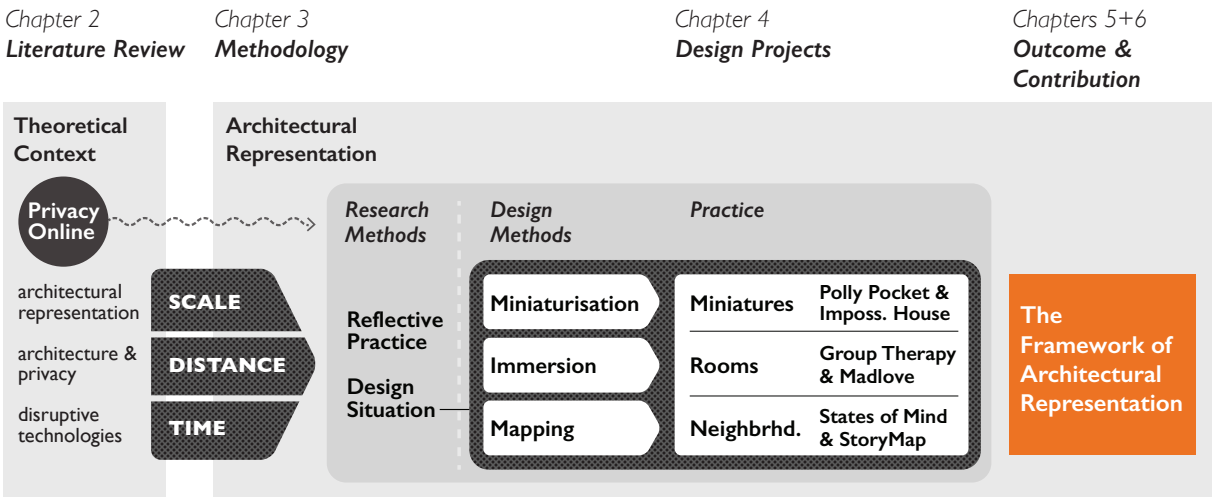


Fig. 2: Research overview

1.6 THESIS STRUCTURE

This thesis is divided into six chapters (Fig.2). This Introduction (Chapter 1) has briefly outlined the challenges driving the practice-led investigation, alongside aims and objectives, research focus and crucially the research questions.

As this research is focused on architectural practice, the Literature Review (Chapter 2) draws on a range of historical and contemporary examples of architectural representation, such as drawings and diagrams. It makes the case for architectural representation as a means of interrogating privacy online by outlining the relationship between architecture and privacy, as well as discussing the framing role of architectural space in mediating interaction, and the disruption thereof through communication technology. A critique of spatial metaphors helps to identify the gap in the literature as an opportunity for inquiry. Three foundational architectural parameters – scale, distance and time – emerge from the review of the literature in the field as relevant to forms of architectural representation, notions of privacy, as well as the challenges of the digital problematised in this research.

The Methodology section (Chapter 3) outlines the research design, bringing together design methods and methods of inquiry under the umbrella of architectural representation as research methodology. The study of architectural

representation allows the articulation of three design methods of miniaturisation, immersion and mapping. These are framed as methods of spatialisation and are informed by the three architectural parameters. Reflective practice forms the core of the research methods, enabling the evaluation of the practice-led inquiry.

Six iteratively developed Design Projects (Chapter 4) are framed as 'design situations' that increase in complexity as they grow in scale, from the miniature, through the scale of the room, to that of the neighbourhood. Aiming to render tangible the abstract object of privacy online by means of representation, each project introduces further 'materials' into each situation as a 'reflective conversation', building on insights from preceding design situations.

The 'Polly Pocket' miniatures and 'The Impossible House' are diagrammatic spatialisations that use the reduction in scale to tame the complexity of the object of investigation. Two room-scale projects form part of the 'Group Therapy' exhibition and use the method of immersion to situate the viewer, creating shifting distance relationships and viewpoints on the spatialised dynamics of online interaction, and moderating relationships between people and content and exploring the encounter of information. 'States of Mind' and the 'StoryMap' are interactive platforms on the scale of the neighbourhood that deploy the method of mapping; they record a range of personal contributions made by audience members in public cultural contexts, focusing on individual agency in processes of sharing and the positioning the individual within a wider network of information.[9]

As tangible representations of the object of research, the design outcomes – called 'spatialisations' – operate as a lens onto the digital: they enable the reconsideration of the challenges surrounding privacy online as the topic of the investigation. Crucially, however, the design projects serve as test-cases for the

9 Appendix 2 presents a timeline of the research process discussed in this thesis. It outlines the range of design projects, as well as indicating publications, conference presentations, workshops and exhibitions that have presented a platform and testbed for ideas as they emerged.

application of the architecturally-grounded methods for engaging with abstract challenges, *such as* privacy online.

The findings emerging from the testing of the principles and methods in practice are consolidated into the 'framework of architectural representation for design and research in association with the digital', presented and discussed in the Outcomes and Discussion chapter (Chapter 5). The framework comprises key principles of architectural representation and the three methods of spatialisation to activate these in practice. The discussion reflects on the research journey, as well as on spatialisation as a new form of representation.

The concluding chapter (Chapter 6) positions the framework as the original contribution this research makes to knowledge in the field of design research, at the intersection of the design domains of architecture and communication design. It lastly outlines some limitations of this inquiry, which point towards future work.

2 LITERATURE REVIEW

This chapter presents the theory that underpins the practice-led inquiry, and establishes the relationship between architectural practice and digital spaces, highlighting the ways in which digitally mediated interaction challenges the orientation of the individual. The parameters of scale, distance and time map across architectural theory and practice, and present key themes that weave through the wider literature, from architectural discourse to sociology and discussions of the digital, helping to articulate the relationship between architectural representation and the digital: understandings of 'scale' range from architectural scale to conceptions of scales of interaction online; 'distance' variously applies to architectural practice at-a-distance from the object of representation, as well as the management of distance and visibility in social interaction; and the notion of 'time' helps to interrogate the permanence of content online, observed to be at the core of the challenges of the digital, and to consider how architectural representation operates projectively.

Various modes of architectural representation mediate these relationships of scale, distance and time between designer and the design object in design processes. Following an overview of architectural methods of representation, the literature surrounding the relationship between architectonic space, behaviour and privacy is reviewed, looking to the ways in which architectural framing helps to navigate relationships between people, considering the management of distance and boundaries, especially. Following a discussion of technologies of communication that subvert the spatial frame as a guide to behaviour, shifting notions of privacy are discussed, in particular in relation to online social media. A brief outline of the shortcomings of ways in which architecture and a return

to 'the spatial' have been used so far to grasp the seemingly boundless realm of the digital, helps to clarify the gap in the field that this research aims to address: the lack of a foundation for design practices to engage with spatially-related challenges of the digital, that are proactive and projective, rather than merely reactive, aiming to use design to deal with problems once they have arisen. In other words, architecture has not yet found an adequate means of responding to the ontological challenges the digital presents the individual with, as design practice lacks appropriate means of rethinking the challenges of the digital through its own parameters.

The importance of the variables of scale, distance and time crystallises through this review of the literature in the field. While they are at play in each of the conditions explored, this chapter is structured to illuminate each variable in turn: firstly, it looks to scale-representation, then to the spatially enabled management of distance, and thirdly to technologies of communication that bring about a conflation of time-space relationships, risking the disorientation of the individual.

Providing the starting point for the practice-led investigation, this overview over the relevant literature in the field in no way aims to be exhaustive or conclusive; further theory, introduced throughout the thesis, will complement it to enrich reflection on projects and their contextualisation within the field. Sources introduced later will help to put into perspective the outcomes of design projects, and to identify how to proceed in the iterative cycle of practice.

2.1 ARCHITECTURAL REPRESENTATION

This first section of the Literature Review will talk about three conventional methods of architectural representation in relation to the architectural parameters: drawings, diagrams, and models. It will further suggest that doll's houses – as *architectural forms* of representation, rather than forms of *architectural representation* – are useful means of aiding the orientation of the viewing subject, by establishing distance relationships and managing time. As will be outlined in detail throughout this first section of the literature review, its ability to work at a remove, both spatially and temporally, from the object of representation is what set architectural representation apart from other forms of visual representation (Evans 1997; Petherbridge 2008).[10]

While all the methods of representation discussed here relate to scale, distance and time, they do so in varying ways. Drawing, as the principle means of devising buildings (Evans 1989), will be explored in-depth in relation to the three variables, while the sections on diagrams and models and on the doll's house, will focus on distance and time, respectively. A clear understanding of conventional methods of architectural representation will be key to the development of a range of architecturally-informed methods of representation in the next chapter of this thesis that will drive the design projects.

2.1.1 Drawing

In architectural practice, forms of architectural representation, such as diagrams, models, and drawing are used in conjunction; however, architectural drawing is the key mode in producing architecture. Drawings are the core object within epistemic design processes that are transformed from objects embodying design knowledge as the outcome of the design process, into technical objects that serve as instruction for construction, at a distance from the

10 Petherbridge (2008) offers an overview of architectural drawing in the wider context of drawing practices.

architect (Emmons 2011). Architectural drawing operates projectively, anticipating structures that are yet-to-be-realised; within this temporal span, drawings shift from being objects that as epistemic objects help the generation of a design, to serving as instruction for construction and manufacture in the form of technical objects.

Architectural representation is the key means by which an architect engages with the object of their practice and by which they can maintain control over the building as the final outcome of the design process. To be able to generate designs for a spatial object, such as a building, it is scaled down and abstracted into a series of representations following established conventions (Evans 1989), as Ray Lucas points out: 'Drawing conventions are particularly important in architecture, each with different demands and affordances.' (2016: 182). While it is frequently complemented by other representational methods, such as model making, both, in the design process, as well as for presentation and dissemination purposes, drawing remains the prevalent method in architectural design processes (Evans 1989). Architecture is a collaborative practice, and one where the architect does not manipulate the object itself, but uses visual scale-representation to give instruction to a diverse range of people involved in realising it (Evans 1989; Evans 1997; Ewenstein & Whyte 2009). As well as being integral to the architect's own design process, architectural drawing is a key mode of communication between architect, client, other consultants in the design process, and eventually is used to instruct contractors to realise the designed object. Visual forms of architectural representation therefore can assume varying functions in architectural practice; organisation scholars Boris Ewenstein and Jennifer Whyte's in-depth study of an architectural design process aims to understand the shifting performance of visual representation as epistemic and technical object (2009).

Visual representation is key to evolve a design as part of an often collaborative and interdisciplinary design process, resulting in a set of representations –

particularly drawings – as instruction to facilitate construction of the designed object: 'As objects, visual representations are used in an intersubjective way in knowledge work that develops both the project process and its product, the design for a building.' (Ewenstein & Whyte 2009: 16) The nature of the object of design is complex: the building as an epistemic object of the overall design process is manipulated by visual representations, which in turn are considered as epistemic objects as 'an instantiation of [the building]' (2009: 26).[11]

Drawing as a key method of architectural representation can be clearly understood in terms of the parameters of scale, distance and time, as discussed in the next sections and summarised in Table 1. This analysis of the capacity of drawing crucially informs the design methods at the heart of this research.

Table 1: Methods of representation

	SCALE	DISTANCE	TIME
DRAWING	reduces scale proportionally, based on standard conventions; relies on precise scale relationships; reduction in scale brings about a reduction in detail	scale-reduction in drawing generates distance between viewer & object of representation; drawing mediates between architect & distant site and between architect and builder, operating as instruction	largely projective, anticipating objects yet-to-be-realised; presentation drawings make an exception
DIAGRAMS & MODELS	embodiment of key conceptual elements, reduced in size & not necessarily to a particular scale; reduction in scale brings about a reduction in information and detail	scale-reduction generates distance between viewer and artifact; establishes distance relationships between discrete elements	largely projective, used especially in early stages of design processes to anticipate and test situations
DOLLHOUSES	imitates reality at reduced scale, aiming to show detail in miniature form	apprehended largely visually, yet suggesting physical manipulation; scale-reduction generates distance between viewer and artifact	while suggesting change through manipulation of objects within, the dollhouse fixes hierarchies in-time, rendering them observable; retrospective in nature, often a small-scale copy of the commissioner's home
SUMMARY	architectural forms of representation tend to operate by reducing in scale	embodies relations btwn discrete elements; reduction in scale effects a distancing relationship between viewer and object	variously projective and retrospective; as epistemic object in design processes largely projective

11 It is worth noting also the shifting role of drawing throughout processes of design: a sheet of trace is the 'focus of epistemic work as it was changed and updated in conversation,' while the underlying site plan serves as a technical object, in this moment acting as a reference point, without being changed itself. Both objects together, as a 'combined image,' are the 'focal object' of the process, 'mediating knowledge from the different participants'. With the building itself being an epistemic object, visual representation aides the 'unfolding' thereof (Ewenstein & Whyte 2009: 21/2).

2.1.1.1 Scalability

Scale in architecture is used actively to manage complexity and to clarify the individual's place in the world. As such, it is one of the 'foundational categories for analysing architecture' (Pallasmaa 2011: 130), as exemplified by Christian churches and cathedrals that use scale in the act of faith to position people within a religious order, 'control[ling] the relationship of the parishioners to the church hierarchy' (Smith 2004: 20).[12] Acting as worldly representations of the kingdom of heaven, churches communicate core religious beliefs and images (Harries 1998), rendering 'cathedral architecture [-] a small-scale representative of the order and harmony that signal God's underlying plan' (Blair 2012: 53). Alberto Pérez-Gómez and Louise Pelletier's account of the evolution of architectural drawing helps to clarify the role of architectural representation in conceiving of buildings at-scale and the interwoven relationship between the two:

> Prior to the Renaissance, architectural drawings were rare, certainly in the sense that is familiar to us. In the Middle Ages, architects did not conceive of a *whole building* and the very notion of *scale* was unknown. (2000: 8; original emphasis)[13]

Scale is crucial to understanding the relationships between things: 'The scale model offers humans an understandable surface (framework) upon which they can project and develop their measures of invisible things.' (Smith 2004: 63) This notion of the scale-model, or the smaller-scale representational device, is explored further in the next section of this Literature Review (2.1.2 Diagrams and Models).

12 Architect Albert C Smith points out: 'The Gothic cathedral is similar to a full-scale model and provides an example of a thinking mechanism used for demonstrating the Christian religion.' (2004: 20)

13 It is through drawing that architecture shifted from being a 'prophetic act' (Pérez-Gómez & Pelletier 2000: 9) to being a projective one, operating at a distance, both spatially and temporally, from the object of design.

Scalability helps to manage complexity throughout the design process intuitively, enabling design development through forms of architectural representation, from the diagrammatic to the detailed. As scale-versions of an object whose design is in process, '[p]rojective drawings of buildings are never exhaustive' and instead offer a 'partial description' that tends to communicate the 'most significant information' (Evans 1989: 25). By means of scale, specific qualities of the design object that are relevant at a particular stage of the process may be focused on variously, allowing the design object to gain complexity as it evolves. In this sense, scale is crucial to focusing attention and providing orientation within complex processes of design. Philosopher Gaston Bachelard notes that 'values become condensed and enriched in miniature' (Bachelard 1958/1994: 150), emphasising the elements that are represented over those that are omitted, or edited. Drawing in this sense might be understood a a process of drawing-attention-to particular elements and qualities; this will be picked up again later in the articulation of the design method of miniaturisation.

2.1.1.2 Distance in Drawing

As the object of design evolves throughout the process, drawings increase resolution and scale, becoming more resolved.[14] They fix the object and render it concrete. Scale mediates the distance between the architect as designer and the object of their design activity. Architect Robin Evans discusses the distancing relationship between drawing and building in his essays 'Architectural Projection' (1989) and 'Translations from Drawing to Building' (1997). Investigat-

14 The reverse process may be observed in architect Andreas Angelidakis' 'TeleportDiner' installation at the Fargfabriken in Stockholm from 2000, which saw a computer-rendered diner constructed physically. This scaled-up version of an object originally only intended to be seen on-screen appears to have a somewhat low resolution, characterised by a lack of detail and the absence of materiality: 'Instead of building a real diner we copy-pasted the "virtual" diner onto the real space. You were no longer virtual or real, and as you glance at your internet enabled device, you are still neither, just both, all the time. Meanwhile in Stockholm, human avatars inhabited a drawing.' (Angelidakis 2011) According to Angelidakis, the installation blurred the boundary between embodied and virtual spaces.

ing the role of drawing in architecture, he points out that architects, unlike artists – such as sculptors – do not engage with the object of their practice directly, and instead work at a distance to the object, through the medium of drawing (Evans 1989; 1997).[15] In what Evans describes as '*reversed directionality* in drawing' (1997: 165; original emphasis), the drawing is the 'locus of the architect's activity' (1997: 172). He focuses much of his writing on drawing in architecture, arguing that 'orthographic projection has been the preponderant method for devising, picturing, and transmitting ideas of buildings before they are built' (Evans 1989: 21). Architect Paul Emmons further highlights the distancing role of scale-drawing in relation to the place of designing, such as the studio, and the site of construction; he argues that architectural representation is a mediating device between architect and site, which enables the architect to work remotely (2011).[16] This sense of working at a distance from the object helps to develop architecturally-informed approaches to engaging with the digital – at a distance.

The drawing as representational device produces a distance not just between the designer and the object of design, however, but also between the viewing subject and the drawing itself. Architect Stan Allen contrasts perspectival depiction with axonometric projection in studying the distance relationship between viewer and drawing in architectural representation: while perspective drawing essentially locks the viewer in a particular position in relation to the represented object, axonometric projection, as a form of parallel projection, places the viewer 'at infinity' (Allen 2000).[17] Allen's argument goes beyond the distance relationships explored by Evans where the drawing is a representa-

15 Evans notes: 'Architects do not make buildings; they make drawings of buildings.' (1989: 21)

16 Ayn Rand presents an opposing caricature of the architect, romanticising the design practices of her fictional protagonist in *The Fountainhead* (1943/2007): Howard Roark spends sleepless nights on a building site, where buildings rise, as if he were shaping them with his own hands, much like a piece of sculpture.

17 Allen's notion of the viewer being placed at infinity is underlined by CAD software: The drawing itself does not change or increase in detail necessarily, while the viewer can zoom in and out, changing their own viewing distance from the drawn object.

tion of the object of design, located elsewhere, and talks specifically about the nature of the drawing in establishing a particular viewing relationship of the subject to the drawing as object. While orthographic drawings can bring the object of representation 'closer' to the viewer through the manipulation of scale, essentially zooming in, it is worth noting the particular positioning role that perspective plays in Allen's argument. Perspectival means of bringing the viewing subject closer to the object of representation will be picked up again when discussing the architecturally-informed methods driving the design projects at the core of this research (Chapter 3).

2.1.1.3 Temporal Dimensions of Drawing

The distance between the building as a product of architectural practice and the architect is useful to consider not only spatially through distance, but also temporally: '[Architecture] is brought into existence through drawing. The subject-matter (the building or space) will exist *after* the drawing, not before it.' (Evans 1997: 165; original emphasis)[18] In this sense, drawing is projective, anticipating something that does not yet exist, as also discussed by Ewenstein and Whyte in their paper on visual representations as knowledge objects: 'Design [-] takes the shape of exploration or inquiry. The drawing is an active participant in a process of exploratory, projective reflection. It does not simply depict or *re*present the previous reflections of the designer or designers.' (2009: 22; original emphasis) Visual representations constitute 'knowledge objects' (Ewenstein & Whyte 2009: 22) that produce a reality that will exist outside of and beyond the medium of representation, rather than merely depicting any existing perceived conditions (Allen 2009: 41; Evans 1997: 165).[19]

18 Stan Allen's point that architectural drawings are 'to *some degree* representational' (Allen 2009: 41; my emphasis) highlights the projective nature of architectural representation, anticipating something that is yet-to-be-built.

19 To quote Evans in full: 'Drawing in architecture is not done after nature, but prior to construction; it is not so much produced by reflection on the reality outside the drawing, as productive of a reality that will end up outside the drawing.' (1997: 165)

The temporal dimensions of drawing are embedded in the distinction between drawing *for* and drawing *of* something; they are 'transmitted to a building' projectively in the first instance, or 'received from it' in the latter (Evans 1989: 19; original emphasis). Drawings *for* something – as are typical in the architectural design process – are generative and projective; representation in that sense is not just a 'depiction' of an observed object or situation, and instead is an active agent in driving the design process. Developing in conjunction with other modes of representation, drawings advance from being epistemic objects to becoming technical ones. The process of creating visual representations *for* an object is the process through which the object of the design process is generated; it evolves and becomes fixed through representation. Architectural drawings *of* an object operate differently, in contrast, communicating something that has already been designed, and potentially built, as Robin Evans notes in relation to the presentation drawing that is neither entirely projective, nor fully representational (1989).

While largely a building-oriented design discipline, architecture has a history of researching and exploring ideas, concepts and new approaches to design through the medium of architectural representation. Sometimes reduced to the term 'paper-architect' (Lucas 2016) practitioners and theorists, such as Peter Eisenman,[20] Daniel Libeskind, Zaha Hadid, Rem Koolhaas and Bernard Tschumi have built their practices on theoretical and conceptual explorations exercised largely through drawing.[21] These theoretical explorations raise the

20 In relation to Eisenman's conceptual, yet built and inhabitable projects, designers Tony Dunne and Fiona Raby note: 'Of all the design disciplines it is probably architecture that has the richest, most diverse tradition for exploring ideas. From paper architecture to visionary design, its long history is full of exciting and inspiring examples. There is a tension between visionary architecture, which has an outward facing social or critical agenda, and paper architecture, which, though often introspective and concerned only with architectural theory, is rarely intended to ever be built.' (2013: 23)

21 Jane Rendell points out: 'Architectural representations may describe spaces with the intention that they will be realised in built-form, or they can propose architectural projects that are unrealisable, which explore and critique the paradigms of knowledge held within the architectural profession and construction industry that underlie the production of the built environment itself.' (2004: 145)

question of audience in architectural representation, as Ray Lucas points out:

> Such theory is designed to be read by visually literate architects [-]: the reader needs to understand architectural representation in order to decode the programmatic element of Tschumi's scripting of extreme or unusual activities in space in his *Manhattan Transcripts* [-]. (2016: 16)[22]

The research presented here, however, aims to identify ways for architectural representation to engage with the challenges of the digital; in the following section, diagrams and models, as well as doll's houses, will be outlined as modes of representation that rely less heavily on architectural conventions than orthographic drawing and offer the potential to be accessible to a wider audience that is of importance in the context of this interdisciplinary research. An understanding of how these methods manipulate the variables of scale, distance and time will help to articulate a range of architecturally-informed methods for design that activate the architectural parameters, concentrating on process instead of output format, as discussed in the next chapter.

2.1.2 Diagrams and Models

Looking to architectural diagrams and models, this section outlines key differences to drawing as the key mode of architectural representation, with regards to the architectural variables of scale, distance and time.[23] It does not, however,

22 Lucas refers to the exploration of 'theoretical propositions' (2016: 16) through design projects and architectural methods, such as drawing, as 'research by drawing' (2016: 176). The case here is made for a wider repertoire of tactics that expand my own practice and render the design methods used in the processes of practice-led research accessible to a wider design audience.

23 The architectural model of interest here is not the detailed presentation model, but the diagrammatic, or conceptual model, dealing with form, volume, and spatial relationships. Models are a key means of thinking about space, and as such play an integral role in spatial design education. While the process of thinking about and designing space becomes more intuitive with the development of design expertise, many architectural design studios maintain models as a key driver in design; prominent examples include architectural practices Herzog and

aim to give a comprehensive overview of diagrams and models as tools in architectural design practice, and is selective in the examples it cites.

While diagrams and models as epistemic objects alongside architectural drawing are key parts of processes of design, operating projectively, they are also communication devices for core principles of the structuring of space and the sequence of experience, as explored extensively by architect Bernard Tschumi, notably in his theoretical explorations in the *Manhattan Transcripts* (1981/1994), and the later competition-winning proposal for the Parc de la Villette in Paris.[24] Architect Christopher Alexander's *A Pattern Language*, for example, uses diagrams in support of text to explain the key patterns of architecture laid out in his treatise for the built environment (Alexander, Ishikawa & Silverstein 1977). Alexander's work is intended to be accessible to non-expert audiences and his use of diagrams is illustrative of the accessibility of diagrams and their clear communicability to diverse audiences.[25]

Building on modernist diagrams, architectural diagrams have gained increasing attention in architectural discourse since the 1980s, both in theory and practice, and theoretical propositions – mentioned already in the previous section – frequently are developed partially through the use of diagrams (Allen 2009; Garcia 2010; Vidler 2000). There have also been developments in architectural design practices that give prominence to architecture that is driven by diagrams.[26]

de Meuron, the Office for Metropolitan Architecture (OMA), and MVRDV.

24 The *Manhattan Transcripts*, for example, explore an architecture of event, where still-images of the scenes of a crime are translated through notation, and ultimately shape architectural form across a range of typologies. Exploring the relationship between narrative and spatial sequence, the architect's work tests the representation of events by means of images, diagrams, notation and drawing (Tschumi 1981/1994; 1996; Migayrou 2014).

25 As the project website states: 'These tools allow anyone, and any group of people, to create beautiful, functional, meaningful places.' (Patternlanguage.com 2017)

26 This trend has been labelled as the 'diagrammatic turn in architecture' by architectural historian Anthony Vidler (2000: 6), and as 'diagram architecture' by architect Stan Allen (2009: 54). Vidler notes that 'followers of the first generation of Modernists *built* diagrammatic buildings to exemplify Modernist principles' (2000: 13; original emphasis). Allen notes that the key is not the generation of architecture by means of diagrams, but the fact that 'a diagram architecture is an architecture that *behaves* like a diagram' (2009: 54; original emphasis).

The architectural diagram and model are considered jointly here due to their capacity to negotiate distance, helping to understand and manage distance relationships between discrete elements. As epistemic objects, two-dimensional diagrams and three-dimensional models are here considered as different expressions of the same process, namely of establishing relationships between discrete elements.[27] Stan Allen points out that 'in the simplest sense, a design model is a three-dimensional diagram' (2009: 68) and highlights its role as a tool to think about organisation: 'Diagrams are syntactic and not semantic, more concerned with structure than with meaning.' (Allen 2009: 50) Further, architectural historian Mark Garcia describes the 'infiltration' of architecture's media by the diagram, noting the 'diagramatisation' of architectural models (2010: 30).[28]

Allen's paper 'Notations + Diagrams: Mapping the Intangible' (2009) is a key source in understanding the relationship between notation and diagrams, and the establishing of as-yet unrealised relationships. Making distinctions between diagrams and notations,[29] the latter of which architectural drawing also belongs to, Allen perhaps offers the most useful definition of diagrams for the purpose of this research, the practice underlying which might be thought of as diagrammatic:

> A diagram is a description of potential relationships among elements; not only an abstract model of the way things behave in the world, but a map of possible worlds. [D]iagrams do not map and represent already existing objects or systems but anticipate new

27 The immediate generative capacity of models in particular becomes clear in pedagogical design contexts, such as my teaching in Interior Architecture at Middlesex University: offering a more intuitive understanding of complex spatial relations, models communicate in an immediate way that transcends – and typically precedes – understandings of orthographic drawing conventions.

28 Garcia's edited volume *The Diagrams of Architecture* (2010) offers a broad overview of diagrams in architecture, from a historical perspective to speculation about the future of the diagram in architecture; this includes several essays by architects, whose work makes use of diagrams, as well as diagrammatic models.

29 'All notations are diagrammatic, but not all diagrams are notational. [-] I would say that notations belong to time, diagrams to space and organization.' (Allen 2009: 49)

> organizations and specify yet to be realized relationships. [D]iagrams support multiple interpretations [and are] instructions for action, or contingent descriptions of possible formal configurations.
> (Allen 2009: 51)

This definition is complemented by one of the architectural model, provided by architect Albert C Smith in his book *Architectural Models as Machine: A New View of Models from Antiquity to the Present Day*:

> A model is typically a small object, usually built to scale, that represents another, often larger, object. It can be a preliminary pattern, serving as a plan, from which an item not yet constructed will be produced. A model can also offer a tentative description a theory or system that accounts for its known properties. Architectural scale models operate in all of these areas, not only defining a future building but also partakes in the definition of a culture's cosmos.
> (2004: 62)

The role of abstraction in the diagram and in the model, and their relative liberation from conventions and openness to interpretation, contrasts with conventions of representation in drawing and other forms of notation (Allen 2009), which rely on an architecturally literate audience (Lucas 2016; Morris 2006; Vidler 2000).[30] Instead, diagrams and models focus on communicating the positioning of elements in relation to each other, and establish scale relationships, adjacencies, distance, as well as temporal sequence. As architect Mark Morris remarks in his book on *Models: Architecture and the Miniature*: 'We are

30 Referring to architectural drawing as 'encodings of representation', Anthony Vidler points out in his paper 'Diagrams of Diagrams: Architectural Abstraction and Modern Representation': 'The architect works in code, code that is readily understood by others in the trade, but is as potentially hermetic to the outsider as a musical score or a mathematical formula.' (2000: 7)

preconditioned to understand miniature objects and therefore models.' (2006: 117) The capacity of the model to operate as a 'thinking machine, that is an idea used for the understandable measuring and testing of the prevailing reference standard's concepts of invisible things' (Smith 2004: 70), is relevant in the context of this practice-led research and will further the development of a range of architecturally informed design methods oriented towards the digital.

Beyond understanding the role of the diagram in the context of this research, however, Allen's key text is of value here due to its speculation on the role of architectural practices in an increasingly complex world that is both physical and virtual. Allen presents a kind-of manifesto for the capacity of architectural representation to deal more effectively with contemporary experience: 'New maps and diagrams might begin to suggest new ways of working with the complex dynamics of the contemporary city.' (Allen 2009: 60) He further proposes that architects 'radicalize the already present and highly specific capacity of architectural drawings to work on reality from a distance [-] to engage the invisible or to activate the virtual' (Allen 2009: 60).[31]

The key role of diagrams and models is to mediate between complex and abstract ideas, be they the kingdom of heaven (Harries 1998), or design ideas that are both developed and communicated through these modes of architectural representation. Having outlined the ways in which the foundational architectural parameters of scale, distance and time are at play in forms of architectural representation – in drawing, diagram and model – the next section will briefly discuss the doll's house as a form of representation. While the diagram and model are of interest with regards to their capacity to establish and clarify distance relationships, particular attention will be given to the role of the doll's house in domesticating time.

31 Alongside this, Garcia speculates on the shifting role of architects in relation to the diagram: 'As the importance of the design of diagrams to knowledge-building is increasingly recognised, the importance of architects and spatial designers as skilled makers of highly extensible diagrams will also increase.' (2010: 312)

2.1.3 Doll's Houses

While not a conventional form of *architectural representation*, and instead an *architectural form* of representation, the doll's house as a type of miniature is a useful object of study to include here. It firmly establishes viewing distance to the observer, 'domesticates' social relationships by means of a reduction in scale, as well as engaging the spatial variable of time: as a more conventional form of representation than the often projective drawing, diagram and model, the doll's house depicts an existing reality outside of itself, and arrests the conditions in time, rendering them observable, spatially fixed, yet manipulable.

Frequently elaborate and intricately detailed, the doll's house – in contrast to architectural drawing, diagrams and models – aims to 'imitate' reality at a smaller scale, offering a 'lifelike representation of objects, surfaces and characters' (Araujo & Spankie 2011: 149).[32] Nevertheless, '[i]n its diminutive scale as well as in its representational status, the dolls house [sic] resembles architectural drawings and models' (Araujo & Spankie 2011: 156). Architectural drawings, models and diagrams as epistemic objects typically anticipate a not-yet-existing building or space and its occupation; however, the detailed miniature is modelled on existing situations, often a scale-representation that offers a snapshot of the house of the commissioner (Stewart 1993; Araujo & Spankie 2011), providing an educational tool, as designers and educators Ana Araujo and Ro Spankie point out: 'By the seventeenth century, [the doll's house] was used as a visual tool for practical instruction to teach young girls their household duties.' (2011: 150) Thus, the 'stage' of the domestic interior is used to control the exterior world, and fixes it in time: 'Worlds of inversion, of contamination and crudeness, are controlled within the dollhouse by an absolute manipulation and control of the boundaries of time and space.' (Stewart 1993: 63) Through the 'transcendent and simultaneous view' it affords (Stewart 1993: 66), the minia-

32 'Titania's Palace', the world's largest doll's house, on display at Egeskov Castle in Denmark, excludes any characters, appearing as if the magical inhabitants – it was built as a palace for fairy king and queen – have just disappeared from sight.

ture is perceived as an object in 'perfect stasis,' suggesting use, implementation and contextualisation, and the viewer is invited to 'project [-] a deliberately framed series of actions' onto this object (Stewart 1993: 54) that aid their orientation within society.[33]

Poet and literary critic Susan Stewart's work highlights the contrast between the intimate interiority – as embodied in the doll's house – and the distance it creates as a medium intended to be 'consumed by the eye' (1993: 62), entered merely mentally, guided by vision, and leaving the viewer 'trapped outside the possibility of a lived reality of the miniature' (1993: 66): doll's houses historically were 'meant to be viewed from a distance, with attention focused upon one scene and then another' (Stewart 1993: 63). While this distance between the viewer and the object applies also to forms of architectural representation, the doll's house as a familiar mode of representation is accessible to a wider audience (Araujo & Spankie 2011).

Representations *of* something, projective drawings *for* something, as well miniature objects outside of the canon of architectural discourse here are shown to fix conditions and ideas through representation, crucially establishing distance relationships between object and viewing subject. This section has established the mediating role of architectural scale-representation between designer, object, and viewer, based on the key variables of scale, distance, and time, and the ways in which representational devices operate as thinking mechanisms. The following section will take a step back and consider the framing of behaviour and interaction in full-scale architectural settings, based on the same architectural variables of scale, distance and time; it will focus in particular on privacy as a quality of interaction, and will examine how this concept has emerged out of architectonic space, and how shifting scales and varying limitations of distance and time can disrupt spatially framed notions of privacy.

33 Araujo and Spankie argue that, in contrast to the architectural model, the doll's house is 'never finished', inviting interaction and continuous rearrangement of furniture (2011: 151). This view contrasts with Stewart's 'perfect stasis', which is of interest here in relation to the spatial variables of scale, distance and time.

2.2 ARCHITECTURE AND PRIVACY

In interrogating the efficacy of architectural practice for thinking differently about the digital, the focus of this research is on spatially-conditioned notions of privacy. These have been inherited from an age when interactions amongst people were able to be understood largely in spatial terms, and architectural tactics have become intuitive means for moderating privacy in physical settings. This second part of the literature review will demonstrate the impact of scale, distance and time as key parameters in framing and moderating relationships between people, navigating varying scales of interaction and proximity. It will outline, how the urban realm, as well as the interior – from the Victorian pub to domestic spaces – have been instrumental in giving rise to individual notions of privacy. The concept of privacy is outlined as an architectural construct, reliant on shared understandings of context.

The capacity of architecture to frame behaviour and to structure interaction by mediating distance relationships is brought to the fore and is later tested through a range of 'design situations'. Architect and theorist Juhani Pallasmaa argues: 'Architecture articulates the encounter of the world and the human mind. It structures the "flesh of the world" through spatial and material images that articulate and give meaning to our basic human existential situations.' (Pallasmaa 2011: 120) Architect Malcolm McCullough further establishes the connection between the scale of the body and the notion of orientation: 'The body gives scale, shape, and orientation to our picture of ourselves in the world.' (2005: 29)

As will be shown in this section, there does not seem to be a suitable modern-day equivalent of the cathedral that uses scale effectively to orient the individual within a complex world, that is both global and local, digital and physical. Instead, the absence of the body as a mediator of scale in digital spaces, and increasing scales of interaction and degrees of visibility in a digital

age, appear to have a disorienting effect on the individual. This challenge will be articulated as the gap, which this research aims to address, at the end of the Literature Review.

The following section will aim to clarify the roles of scale, distance and time in interaction. Starting with the management of distance relationships in the pre-digital city and interior that give rise to notions of privacy, shifts in understandings of the architectural frame brought about by communication technologies are discussed with a focus on individual notions of privacy. Online social media, in particular, are shown to disrupt inherited understandings of both distance and time, impacting on the individual's view of the world and their position within it.

2.2.1 Architecturally Mediated Distance

To understand better the connections of architectural space, the management of distance and notions of privacy, it is useful in the first instance to return briefly to the metropolises of the nineteenth century and to revisit the effects of rapid urbanisation on the individual dweller; this is followed by a move into the realm of the interior to understand means of moderating distance, and by an outline of key concepts of privacy, as they relate to architectural space, before moving on to the disruption of inherited notions of privacy through communication technology.

2.2.1.1 Orientation in the City

Expanding scales of interaction alongside increasing degrees of visibility to a growing number of others, in conjunction with decreasing physical distance between people, demanded of the individual tactics for 'self-preservation in the face of the large city', as sociologist Georg Simmel considers in his essay 'The Metropolis and Mental Life', first published in 1903 (1969: 52; see also Allen 2000). According to Simmel, 'individualization' occurs proportional to scales of

interaction, proximity and degrees of visibility and he talks about 'reserve' as an 'elemental [form] of socialization' (1903/1969: 53), required as an ameliorating tactic to avoid overstimulation from close interaction with vast numbers of people.[34] In reference to Simmel's work, architectural historian Anthony Vidler argues that this close proximity resulted in the interpretation of physical space as a symbolic '*expression* of social conditions' (2001: 68; original emphasis): 'In the face of the crowded disorder of the modern metropolis […], the "sensitive and nervous modern person" required a degree of spatial isolation as a kind of prophylactic against psychological intrusion.' (Vidler 2001: 67) Amplified by close proximity to large numbers of strangers, the 'omnipotence of sight' (Vidler 2001: 69) and resulting challenges to the integrity of the individual are initially rooted in visibility and accessibility, the means of attaining which – whether intentional or not – in the age of digital communication and online social media are no longer confined by the tangible dimensions of space and time. They extend beyond direct sightlines, as well as beyond the natural limitations of time, due to the recording capacity of technology.

While the close proximity to others requires increasing defence mechanisms against the 'outside incursion or curiosity' (Mulvey 1989: 69), the city can also provide shelter: 'In the 19th century city, anonymity guaranteed a degree of privacy – in public. New urban spaces allowed for strangers to occupy the same continuous physical space while being entirely [-] self-absorbed in private exchanges.' (Liu 2011: 210) Again, scale has an impact on notions of privacy, in this case decreasing individual visibility, by being one of many.[35] The defence against overstimulation and close proximity to others is aided by the tectonic

34 He argues that 'individualization' is an effect of this close proximity and high visibility, and has become a means of 'asserting [the urban dweller's] own personality within the dimensions of metropolitan life' (1903/1969: 57). Papacharissi and Gibson also note: 'The privacy question, in its present form, is an urban problem of modernity.' (2011: 78)

35 Beatriz Colomina picks this up in her discussion of the mask in modern society, in particular in the context of Vienna and Adolf Loos' work; the notion of the mask and concealing difference in external appearance offers the urban dweller anonymity in the crowd. See Colomina 1996: 23-38.

space of the city, which offers a range of settings that act as the backdrop to interaction with others. As architect Malcolm McCullough points out: 'Social recreation uses public sites for the presentation of self, for which physical architecture sets the stage.' (2005: 28)

Giambattista Nolli's iconic map of Rome from 1748 brings together the architectonic environment of the city and the scale representation of the architectural drawing explored in the previous chapter.[36]

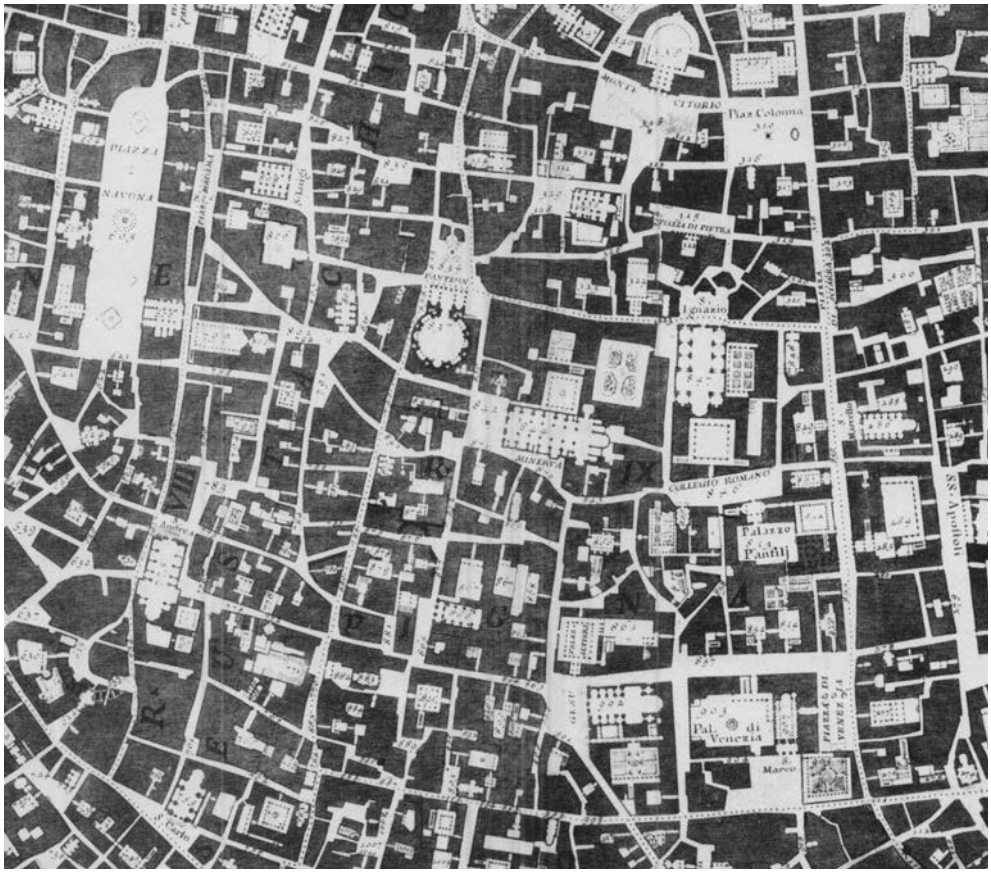


Fig. 3: Extract from Nolli's Map of Rome. University of Oregon Nolli Map © 2005, courtesy of the University of Oregon

As a representation of public access across the city of Rome, '[t]he plan represents public space, while it obliterates or hides the private' (Stoppani 2007: 105)[37]. Physical space, however, merely suggests degrees of privacy, rather

36 The Nolli map is of interest here as a visual means of charting degrees of access and opportunities for retreat across the city, using orthographic drawing to document the porosity of the city. It is divided into white 'public' and black 'private' spaces, suggesting a clear delineation between the two. Resembling the nowadays familiar figure-ground diagrams, the drawing is not used to distinguish built form from open space – or inside from outside – and instead differentiates private spaces with restricted access from those that are publicly accessible, including, the plethora of churches across Rome.

37 The map shows that degrees of public access in the city have remained largely unchanged and the drawing was used by Rome's planning authorities until the

than denoting what is private, as in the areas in Nolli's map that are shaded black: the potential of a spatial setting to offer privacy is only activated in the inhabitation of the space. Conditions of privacy therefore are always contingent within the dynamics of interaction between people, as already indicated by Simmel's tactic of 'reserve'.

The porous architectural setting of the city is apprehended predominantly visually, enabling control through movement. Further to providing a backdrop, architectural devices orchestrate movement in the city and frame everyday life.[38] The urban image aids the orientation of the individual and their emplacement within the city, as Walter Benjamin's and Asja Lacis' note in their evocative description of Naples: 'No one orients himself by house numbers. Shops, wells and churches are the reference points - and not always simple ones.' (1978: 166) Legibility of the urban context is key in order to understand ones own relation to others within the city, helping to provide orientation to manage social relations. Describing this legibility as 'imageability' in his seminal work on *The Image of the City* (1960), urban planner Kevin Lynch investigates the role of the structure and form of the urban environment in providing orientation and aiding wayfinding.[39] A legible environment allows people to build mental maps of places that in their scale and complexity transcend perspectival

1970s (Prestinenza Puglisi 2015: 26).

38 Walter Benjamin and Asja Lacis observe in *Naples*: 'Buildings are used as a popular stage. They are all divided into innumerable, simultaneously animated theatres. Balcony, courtyard, window, staircase, roof are at the same time stage and boxes.' (1978: 167) While architectural devices in the city impact on the individual mainly by being moved through, they offer limited scope for physical manipulation; William H. Whyte's study of behaviour in public places highlights some exceptions and shows how people negotiate proximity and territory using flexible street furniture as a means of taking ownership (Whyte 1988).

39 Legibility and the movement of the viewing subject in the city are intrinsically interwoven with scale, as explored by architects Robert Venturi, Denise Scott Brown and Steven Izenour in their study *Learning from Las Vegas* (1977), which examines the relationships between speed of movement, attention, distance and scales of architectural form; speed of movement, for example, has an impact on the ways in which built form and other signs operate, determining its representational role: buildings are forms of representation that aim to communicate a set of values and often act as an advertising billboard; see also Harries (1998). The challenge of scale in relation to distance management and understandings of the positioning of the individual is explored further through the design practice at the heart of this research.

vision. Beyond 'imageability' merely aiding wayfinding, 'humans assimilate their surroundings by means of mentally constructed representations of spatial relationships' (McCullough 2005: 33). Legibility provides a sense of orientation, enabling purposeful movement and control over distance, visibility and one's positioning in relation to others, offering the opportunity for 'reserve' and privacy.

Having discussed privacy as emerging from the management of visibility and distance within the urban realm and the orienting role of the architectural backdrop of the city, the next section will briefly consider the role of spatial devices in buildings and interior spaces in enhancing a sense of privacy; this is followed by an outline of the ways, in which technology disrupts the clues for orientation set out by the spatial frame.

2.2.1.2 Moderating Distance in the Interior

Spatial devices within the architectural interior enhance the sense of control in the management of distance and visibility that is at the heart of inherited notions of privacy, especially in the transition from the city to the domestic realm, as the French writer Georges Perec illustrates: 'We protect ourselves, we barricade ourselves in. Doors stop and separate. The door breaks space in two, splits it, prevents osmosis, imposes a partition. On one side, me and *my place*, the private, the domestic [-]; on the other side, other people, the world, the public, politics.' (Perec 1974/1999: 37; original emphasis)

The evolution of privacy, and the settings that provide it, is closely intertwined with the desire to separate occupants of interior spaces based on social status and role. As McCullough argues:

> Interpersonal distance is the great mediator of social standing. On almost any scale, the inflection of interpersonal distance provides a tacit set of social cues. [-] Framing the interplay of embodied

> behaviours remains the most important function of environment. Building instrumentalizes and civilizes social distance. Architecture consists of built relations. [-] Body image reinforces these systems [of social distance] with distinct codes of behaviour and dress. These etiquettes do not stifle social expression so much as specialize it. They do not fix distance rigidly so much as establish the variables for fair play of the game. (2005: 39)

This social separation has influenced the way space is structured and how it orchestrates movement in Western European architecture, separating, and offering opportunities for retreat, as two examples will show; as a result, the concept of privacy is well understood in spatial terms, and architecture offers an intuitive guide to behaviour.

The Victorian public house as a confluence of sociality in urban neighbourhoods reflects societal hierarchies: while open to a broad cross-section of society, pubs segregated spatially with walls and semi-transparent screens as means of division between social class and gender, creating a range of semi-permeable rooms (Grafe & Bollerey 2007).[40] Frequently, the bar at the centre of the space was the only device permeating the separated areas, and only glances across it would grant patrons views into other spaces.[41]

As outlined by Robin Evans in his essay 'Figures, Doors and Passages' (1997), the desire to spatially separate servants from those they served was a key driver in the typological development of the corridor in the English manor

40 In this, the Victorian pub marks a clear departure from the order within coffeehouses of the seventeenth and eighteenth centuries, which were somewhat more democratic, offering patrons access for the price of a cup of coffee, regardless of social circumstance; however, women were not granted access, while public house introduced segregated spaces for women (Grafe & Bollerey 2007).

41 The 'Princess Louise' pub in Holborn, central London, is a good example of this: it uses walls, doors and glass screens to create degrees of separation within the interior of the pub. Having previously been removed, privacy screens were reinstated and the space was returned as closely as possible to its original state in the early 2000s.

house in the seventeenth century.[42] Spatial devices, such as the corridor in manor houses, as well as the widespread partitioning of homes into rooms in the seventeenth century (Solove 2009), have become spatial means of moderating distance and of mediating interaction. Creating greater levels of privacy through establishing distance and separation, moderating access and allowing control, architecture has instituted a paradigm shift that has outlasted the social hierarchies that helped to generate it: 'By the eighteenth century, the bourgeois individual began to value privacy over public displays of self-control and embraced a sentimentalized idea of the domestic sphere as a political and ethical alternative to the corruption, falseness and inauthenticity of the court.' (Liu 2011: 209) The desire for separation and distance within the interior has shaped the ways in which built space affords its users degrees of privacy and control.

Physical environments allow inhabitants to exercise control by means of architectural tactics, such as closing a door to gain greater degrees of privacy (McCullough 2005)[43] in a way that does not yet appear to have found an equivalent online. McCullough underlines the intuitive nature in which architecture operates as a form of etiquette: 'All of this becomes second nature: architecture is experienced habitually and in a state of distraction' (2005: 164).[44]

42 In contrast to the hitherto conventional web of interconnected rooms as evident in Raphael's Villa Madama from the previous century, the social relationship between occupants of the domestic interiors has become formalised architecturally through the creation of passageways (Evans 1997). The corridor acts as a form of communication and frames human interaction through the spatial means of doors and walls; it fixes and enforces hierarchical relationships typologically, as well as assuming a role in moderating proximity.

43 Spatial devices of separation, such as walls and screens, and apertures, such as doors and peepholes, that demand architectural tactics, such as peeking through half-opened doors, are deployed effectively in the exhibition '1,000 m2 of Desire: Architecture and Sexuality' at the Centre de Cultura Contemporània de Barcelona (CCCB) (25 October 2016 - 19 March 2017); see de Caters et al. (2016). A range of viewing conditions and settings reflect the nature of the curatorial content by casting the gallery visitor as a voyeur: Carlo Mollino's nude polaroids are displayed inside a small darkened closet, a series of sexually explicit illustrations placed within walls are viewed through peep-holes and a sexually explicit film can be seen through a door that opens only slightly.

44 This intuitive nature and 'state of distraction' are echoed in Beatriz Colomina's

Architectural space and spatial devices, 'elements', or 'primal architectural images', as architect and theorist Juhani Pallasmaa calls them (2011: 128), help to frame experience: 'The world seen through a window is a tamed and domesticated world. A view through a window has already been given a specific directionality, scale and meaning.' (Pallasmaa 2011: 130) Architectural historian Beatriz Colomina further argues: 'Architecture is not simply a platform that accommodates the viewing subject. It is a viewing mechanism that produces the subject. It precedes and frames its occupant.' (1996: 250) This framing of the subject and the domestication of experience through spatial means resonate with Stewart's taming role of the doll's house (1993): as an orientation device, space on a range of scales, from the body to the miniature object, enables the viewer to understand their place within the world. At the same time, spatial devices afford occupants of physical spaces agency in negotiating distance and visibility to others.

The notion of a private sphere – of which the domestic interior is the archetype (Scott 2015: xvi; Solove 2009: 58)[45] – suggests a controlled physical environment that empowers the individual, lending control over access through the manipulation of spatial devices, as well as through movement, both in the interior, and in the city. Privacy evolved as a means of managing access, thus moderating scales of interaction, and of controlling visibility within spatial environments.

The spatial strategies and tactics outlined so far rely on synchronicity: while architecture is instrumental in preserving the integrity of the individual by

discussion of architectural space and media in the age of modernity. Describing degrees of control established within the interior of architect Adolf Loos' Müller house, Colomina points out that '[c]omfort is produced by two seemingly opposing conditions, intimacy and control' (1996: 244; see also: Colomina 1992: 82). Colomina's notion of intimacy in the context of the city is useful here and will be picked up later in the discussion of the role of architecture and architectural representation in relation to digital settings of interaction: 'The intimate is not a space but a relationship between spaces.' (Colomina 1996: 28)

45 'Architecture is our primary instrument of orientation in the world; our home determines the ultimate meaning of interiority and exteriority, familiarity and unfamiliarity, homeness and being away.' (Pallasmaa 2011: 121)

offering mechanisms and spatial tactics of control, architecturally generated expectations of privacy and assumptions about interactions with others are disrupted online, especially in online social media, as will be discussed shortly. They are reliant on a shared understanding of context, of being in the same space, or within reach. Importantly, the intuitive tactics and spatial strategies outlined against the backdrop of the city and the interior, are premised on simultaneity – being in the same space, or within reach *at the same time*.

The next section will look at the ways in which communication technologies are subverting the integrity of the spatial frame, thus creating disjunction between expectations of information flows in physical spaces and what is experienced online. This is the challenge at the core of this inquiry.

2.3 ARCHITECTURE, DISRUPTIVE TECHNOLOGIES AND DIGITAL SPACES

Following the exploration into the spatial framing of interaction, and the quality of privacy in particular, this section outlines the disruption of inherited notions of privacy through communication technology and looks to architectural points of reference in understanding the intangible realm of the digital. This section critiques the use of architectural metaphors to grasp the novel territory of the digital and suggests that while they might initially be helpful in grasping new concepts, they do not easily capture interaction in online social media due to their inability to respond to the architectural parameters of scale, distance and time, which are key to thinking about interaction online and shifting notions of privacy. By articulating the limitations of these ways of relating architecture to the digital, the Literature Review helps to scope out research opportunities for the architectural design practice at the heart of this research. These will be focused on developing strategies for using methods of architectural representation to think about and design for digital spaces.

I am drawing here on a range of sources that precede the social web, or 'Web 3.0' (Keen 2012), demonstrating that the challenges discussed here are not entirely new, and instead fall into well understood patterns of global communication and 'time-space distanciation' (Harvey 1990; Giddens 1990): the arrival of radio, telephone and television arguably have had a more profound impact on conceptions of space and time (Lind 2010).[46]

46 As Michael Lind, policy director of the New America Foundation's economic-growth program, notes in his 2010 opinion piece for *Time* magazine: 'In fact, the gadgets of the information age have had nothing like the transformative effects on life and industry that indoor electric lighting, refrigerators, electric and natural gas ovens and indoor plumbing produced in the early to mid-20th century. Is the combination of a phone, video screen and keyboard really as revolutionary as the original telephone, the original television set or the original typewriter was?' (Lind 2010)

2.3.1 Technologies of Communication

Rapidly shifting interaction in digitally mediated communication, increasing visibility and scaling-up of audiences constitute layers of information and complexity, that are less tangible than the architectural backdrop of the city. The intuitive framing role of physical settings and the cohesion of the spatial frame discussed in the last two sections are disrupted by technologies aimed at overcoming spatial and temporal limitations and boundaries; this impacts the individual, from easing communication with friends, family and colleagues across the globe, to posing challenges to notions of privacy and the integrity of the individual. As new media theorist Lev Manovich ascertains: '[Telecommunication and telepresence] collapse physical distances, uprooting familiar patterns of perception that ground our culture and politics.' (2001: 172) He draws on the work of philosopher Walter Benjamin and media theorist Paul Virilio in an analysis of the 'elimination' of distance as a 'fundamental condition of human perception' through film, telecommunication and telepresence (2001: 174).[47] Stan Allen further summarises shifts in the perception of the urban realm:

> Today, the technologies of communication, information exchange, and war, along with the economies of multi-national capitalism and global commodity exchange, have produced a condition in which the urban site is no longer simply geographic. The local, physical difference of cities [-] is being progressively erased with the exchange of information, knowledge, and technique. All cities today are instantaneously connected as part of vast networks, in which images, data and money flow freely. (2009: 56/9)

47 'This reading of the distance involved in vision as something positive, as a necessary ingredient of human culture, provides an important alternative for a much more dominant tendency in modern thought to read distance negatively.' (Manovich 2001: 174)

Having discussed the roles of scale and distance, this section outlines the impact of a range of technologies in subverting the architectural framing of interaction for the purposes of communication, as well as for surveillance; it will focus in particular on the impact of time on individual understandings of contexts, before moving on to discuss the nature of interactions mediated by online social media and instances of the challenges to spatially-conditioned notions of privacy; these will later help to frame architectural representation as a set of practices that respond to such challenges.

2.3.1.1 Overcoming Distance

An analog mechanism of surveillance presents an early example of disruptive technologies aimed at overcoming distance and devices of separation: marble slots were let into walls in Venetian buildings to spy and report on neighbours in the late seventeenth and throughout the eighteenth centuries, subverting the control mechanism of the wall and its moderation of distance (Johnson 2011).[48] Communication technologies, in contrast, intend to connect people across distance and time. Despite the benefit of easing communication and exchange, they challenge the spatial frame and its key architectural parameters of scale, distance and time: the invention of the telephone overcame distance, impacting on the way buildings function and cities are planned (McCullough 2005), yet maintained the need for simultaneous communication, at least until the arrival of answering machines; the internet has provided the platform for the development for further such synchronous communication media that delimit presence, such as Skype, mediating both image and sound in spite of distance.[49] Alternatively, email and mobile text messaging services allow people to communicate across distance, yet asynchronously.[50] The impact of such

48 Crafted with 'grotesque face and gaping mouth, [the slots] aroused the feeling that someone was always watching.' (Johnson 2011: 210)

49 These technologies operate in real-time, as Lev Manovich points out in his discussion of telepresence: 'the construction of representations [such as captured images] takes place instantaneously.' (2001: 168)

50 While not a communication technology and instead aiming to enhance security,

communication technologies is captured in Marxist geographer David Harvey's notion of time-space compression (1990) and sociologist Anthony Gidden's time-space distanciation (1990): time-space shifts challenge the individual user's ability to gauge contexts of action and interaction, leading to 'unintended consequences' (Giddens 1990) that resonate with the disruptive impact of digital communication mentioned earlier in relation to social media mishaps. As McCullough points out, 'electronic media eliminate distance and differences, not only across physical geography, but also across social hierarchy' (2005: 180).[51]

2.3.1.2 Asynchronous Interaction

Extending Harvey's 'annihilation of space through time' (1990: 293) the temporal limitations of simultaneity that – in conjunction with the moderation of proximity – help the individual to navigate analog and shared contexts of sociality, have been disrupted in online social media. The control over access and conditions of privacy in the city, as represented by Giambattista Nolli, for example, depend on the simultaneous occupation of the same space. However, synchronicity is no longer a characteristic of interaction mediated by digital communication technology, and information can be accessed at a later date. Recording mechanisms shift temporalities in 'asynchronous communication' (Negroponte 1995: 167), and they contain the potential for different future audiences. Online platforms for communication transcend limitations of space

CCTV records activity in fixed physical locations and makes this documentation accessible to others outside of time and place.

51 Baudrillard discusses the 'era of miniaturization' and changing dynamics of interaction and self-identity, and connects these to shifts in perceptions of scale, distance and time, that are key to this inquiry: 'The era of miniaturization, of remote control, and of a microprocessing of time, bodies and pleasure has come. There is no longer an ideal principle of these things on a human scale. All that remains are miniaturized, concentrated and immediately available effects.' (1988: 18) As Vilem Flusser also notes: 'We live in an expanding universe: the media offer us more and more things of which we can have no immediate experience, and take away, one by one, the things with which we can communicate directly.' (1973/2002: 27) This detachment of mediated effects from the scale and proximity of the individual in the landscape of television and advertising is mirrored in the disorientation experienced in online spaces.

and time, connecting people globally, and across time. The recording of online activity in online social media through conversation logs and timelines, for example, enables others to recall and distribute information about oneself at a later date, expanding the visibility of shared content beyond not only the control, but also the awareness of the individual. As cultural theorist Paul Virilio already proclaimed before the arrival of online social media: 'We are in a speed-space: it is the recording capacities of a machine which will allow people of the future to see me.' (Dercon 2001: 73)

While a 'nostalgia for space' in the face of the post-spatial digital realms of interaction follows on from the 'nostalgia for time and history' (Vidler 2001: 235) as experienced already by the Victorians during the Industrial Revolution (Tally Jr. 2013), the shifts in the role of time induced and amplified by online communication platforms have thrown into turmoil the framing role of architectural space. A key shift has occurred in relation to time:[52] challenges in grasping scale relations online do not emerge only from the abstract settings of digital interaction, but are a product of the continuous presence of shared content, resulting from the recording capacity of networking sites. Streams of information online are *sticky* in that content hangs on and does not fade, yet they are *slippery* in that they are difficult to control:[53] content, once shared, is easily made accessible to others, often without one's own awareness, as audiences are scaled up through the store-and-forward capacity of social media (Trepte & Reinecke 2011).[54]

52 In his urban sociology, Simmel presents time as a crucial agent in preventing 'inextricable chaos' in the modern city (1903/1969: 50), proposing time-keeping and time-management as solutions to the density of exchange and interaction in the metropolis. Further, according to architect Juhani Pallasmaa, 'the existential task of architecture is to relate us to time as much as to space', yet, he also acknowledges that '[t]he second task of architecture, to mediate human's relation with the fleeting element of time, is usually disregarded' (1998: 54).

53 The notions of 'stickiness' and 'slipperiness' of content in online social media were put forward in the paper presentation 'Decompressing the Self', discussing miniature objects as witnesses to the research process at the Design History Society Annual Conference 2016 under the theme of 'Design and Time' (8-10 Sept 2016).

54 Sabine Trepte and Leonard Reinecke note: 'Social network sites are known for intruding their users' privacy per default.' (2011: 61)

On the surface, social media facilitate instantaneous communication and suggest simultaneity (Scott 2015; McArthur & White 2016),[55] however, they are an asynchronous medium, allowing people to interact with each other against the limitations of time:

> Rather than interact directly with another person, we interact with and make assessments from a representation that acts in proxy. However, in technologically-mediated environments, these representations are often impoverished, and indictors [sic] of the boundary between privacy and publicity are unclear.
> (Palen & Dourish 2003: 132)

The seeming ephemerality of content shared via social media, such as flippant remarks and spur-of-the-moment comments at the heart of previously cited social media mishaps (see Chapter 1), is at odds not only with inherited notions of privacy framed by architectural space, but also with the persistence built into networking platforms and the ways in which they handle information: constant connectedness and potential availability of individuals and their recorded activity through 'technologies of the self' (Floridi 2014) in spite of time have rendered it one of the core challenges of mediated interaction. Removing temporal limitation, store-and-forward technologies are based on the sharing of content – regardless of its qualitative ephemerality – that does not fade and remains available to future audiences, through what here is termed 'retrospective accessibility'. This results in a lack of control of perceptions of individuals online:

> In virtual settings created by information technologies, audiences are no longer circumscribed by physical space; they can be large,

55 McArthur and White (2016) discuss the role of simultaneous interaction in regularly scheduled Twitter chats and its impact on a sense of belonging.

> unknown and distant. Additionally, the recordability and subsequent persistence of information, especially that which was once ephemeral, means that audiences can exist not only in the present, but in future as well. (Palen & Dourish 2003: 130).

While social media expand individual reach and increase visibility to others, this visibility also risks 'overexposure', as media theorist and critic Geert Lovink points out (2015: 172).[56]

Having discussed the role of technology in overcoming the limitations of space and time, the next section discusses resulting shifts in notions of privacy. This will be followed by an outline of how architecture has so far responded to challenges brought about by the digital, leading to the suggestion that architecture, and its underlying principles, might be instrumentalised through design practices that enhance understandings of rapidly shifting contexts of interaction and orientation within these. This position will be articulated more fully in the 'Methodology' chapter (Chapter 3).

2.3.2 Shifting Notions of Privacy

This section will discuss some of the challenges to inherited notions of privacy and contexts of interaction, having charted the generation of notions of privacy as a form of distance management in the context of the city and interior spaces, and having outlined shifts with respect to scale, distance and time, brought on by digital communication technologies. It is, however, important to point out that this investigation does not aim to give a comprehensive overview of contemporary understandings of privacy, or to offer a definition of privacy. Instead, privacy online, and in the context of online social media in particular,

56 Baudrillard already likens the state of mind of the individual in light of changing dynamics of interaction and self-identity in television and advertising to a form of schizophrenia: 'The schizophrenic is not, as generally claimed, characterized by his loss of touch with reality, but by the absolute proximity to and total instantaneousness with things, this overexposure to the transparency of the world.' (1988: 27)

is considered exemplary of challenges that emerge from the use of information and communication technologies; further, it helps to articulate the framing role of architectural space, which will be instrumental to engage with the challenges of the digital through design practice.

In the information age, publicity and privacy are no longer mappable across a whole city, as suggested by Nolli's map of Rome. Instead, these conditions depend increasingly on the needs and desires of those affected by them (Palen & Dourish 2003; Solove 2009).[57]

In his book *Understanding Privacy* (2009), Solove notes the importance of means of conceptualising privacy for the information age, framing it as 'a set of protections against a plurality of distinct but related problems' (2009: 171). He proposes a theory of privacy that 'consist[s] of a framework for identifying the plurality of things that fall under the rubric of privacy' (2009: 67), aimed at helping legal and policy development by identifying privacy problems[58] and focusing on activities that create them. Helen Nissenbaum, an expert in information science, has also developed a conceptual framework for privacy, aiming to help address privacy challenges by facilitating better understanding and evaluation thereof. In her book *Privacy in Context: Technology, Policy, and the Integrity of Social Life* (2010), she discusses the relationship between constraints on access and forms of control, arguing that 'control over information about oneself is an important dimension of privacy, but so is the degree of access that others have to this information, irrespective of who is in control' (2010: 71). Crucially, however, Nissenbaum's framework is focused on the notion of 'contextual integrity', and she argues that meeting individual expectations of flows of information is crucial beyond limiting the transmission of information: 'Where a schism [between experience and expectation] has resulted from radical change in the flows of personal information, it is experienced and

57 'The history of communications privacy indicates that it was more the product of social desires than existing realities.' (Solove 2009: 61)

58 'A problem is a situation that creates harms to individuals and society. A privacy problem can create many different types of harm.' (Solove 2009:174).

protested as a violation of privacy.' (2010: 231)

Frameworks, such as those proposed by Solove and Nissenbaum, are critical to the development of approaches to information and communication technologies that help to navigate privacy issues, especially in policy and law. They further help to analyse and understand challenges to individual notions of privacy, such as the social media mishaps mentioned already in the Introduction. However, the focus of this research is not the analysis of individual cases, or the better understanding of conflicts of underlying values, but the development of strategies for design practice to engage proactively with the challenges of privacy, and to identify ways of better orienting the individual within contexts of interaction. This, in turn, connects strongly to the debates set out by these two scholars, and especially to Nissenbaum's advocation of context in negotiating contemporary privacy challenges, as also argued by Palen and Dourish: as a 'social phenomenon', privacy is contested and negotiated in relation to context (2003: 132). While Nissenbaum argues against attempts at defining privacy per se, social media scholar danah boyd [chosen spelling][59] offers a useful way of understanding privacy in her book *It's Complicated: The Social Lives of Networked Teens* (2014), in which she discusses shifting notions of privacy, and outlines the persistence of its value in social media practices:

> Privacy is not a static construct. It is not an inherent property of any particular information or setting. It is a process by which people seek to have control over a social situation by managing impressions, information flows, and context. (2014: 76)

boyd's notion of privacy is key to my understanding of it as a quality of interaction. This conception considers privacy as a spatially-conditioned quality of interaction, focused on 'physical privacy' (Nissenbaum 2010: 71) whereby

59 boyd consistently spells her name in lowercase.

architectural space provides a means of exercising control. Context-dependent notions of privacy are challenged by online sites of interaction, and audiences and visibility are subject to scaling-up and shifting. Online settings are difficult to gauge and both contexts of interaction and individual notions of privacy are left in-flux and without fixity: Appendix 3 discusses an example of context-dependent forms of interaction that span physical and digital settings, aiming to illustrate the complexities of anticipating contexts of interaction. Understanding privacy as a quality of interaction in-flux crucially allows for a move away from a public-private dichotomy.[60] This is useful, as settings of interaction – clearly defined and understood largely intuitively framed by architectural space – have become subject to shifts beyond the awareness and control of the individual online, as will be discussed in the next section, rendering the boundaries between public and private less clearly defined and intuitive. Solove quotes philosopher Julie Inness on privacy, secrecy and control: '[P]rivacy might not necessarily be opposed to publicity; its function might be to provide the individual with control over certain aspects of her life.' (2009: 24) This control appears to be lacking in mediated interaction; the architectural moderation of distance depends on individual control over degrees of visibility and disclosure, and scales of interaction. Understood clearly as 'reserve' in the city and the management of proximity to others in the realm of the interior, the notion of privacy as a 'measure of access' (boyd 2014: 59) has been disrupted in online interaction.

danah boyd discusses the 'persistence' of information shared online in relation to its crossing of boundaries (2014: 64), arguing that 'contexts are networked and collapsed, audiences are invisible, and everything [teens] say or do can easily be taken out of context' (2014: 53). However, many of the norms and inherited etiquette at the heart of interaction are rooted in direct

60 Helen Nissenbaum discusses this dichotomy in detail, arguing it has 'dominated—and [-] subverted—a great deal of thinking on the subject of privacy' (Nissenbaum 2010: 66).

and simultaneous face-to-face interaction: 'impression management' and the gauging of audience response (Goffman 1959/1971; Giddens 1990) are crucial agents in preserving the integrity and authenticity of the self and are connected to the individual's sense of self and their understanding of the world and contexts of interaction from their point-of-view. What Giddens calls the 'reflexive monitoring of action' refers to Goffman's 'monitoring of behaviour and its contexts' (Giddens 1990: 36).[61] Malcolm McCullough echoes sociologist Erving Goffman's theatrical sociology and argues that

> electronic connections have eroded our ability to play different roles onstage and backstage in our lives. When we never know who is watching, or conversely, when we can watch activities at social remove without having to make corresponding physical passages, then we tend toward some tyranny of the casual. (2005: 179)

boyd describes impression management, both online and offline, as a 'social process', dependent on the behaviour of others, as well as oneself.[62] Online, however, contexts of interaction expand and shift, disrupting the potential for this kind of reflexive monitoring (Palen & Dourish 2003)[63] and challenging the social process, as platforms are premised on amplification: users are encouraged to share content posted by those whom they follow with their own followers, relaying it to them in the formats of timelines and newsfeeds (van Dijck

61 Central to Goffman's argument is the role of non-verbal communication, such as body language and facial expression, that need to be 'managed' by the individual in order to ensure consistency in how one appears to others; this process requires the ability to retreat and to be able to distinguish between being on a notional 'stage' in direct, face-to-face communication with others, or being 'backstage'. See also Kivisto & Pittman (2013).

62 She points out: 'Their [teens'] self-representation is constructed through what they explicitly provide, through what their friends share, and as a product of how other people respond to them.' (2014: 49)

63 'Our *reflexive interpretability of action*— one's own ability to understand and anticipate how one's actions (and information, demeanor, etc.) appear to others—is sometimes compromised in information technology supported environment [sic] and has repercussions for privacy management.' (Palen & Dourish 2003: 132; original emphasis)

2013; Fuchs 2014; Papacharissi 2009; Papacharissi & Gibson 2011; Trepte & Reinecke 2011). Often, sharing activity is out of the control of those who initially shared content, as practices, such as tagging by others, might associate one with content involuntarily, or without awareness of the heightened degrees of visibility (boyd 2014).[64] The challenge to the privacy of the individual online lies in the asynchronous and geographically dispersed nature of mediation, exemplified by online social media, that makes it difficult to exercise control by means of familiar spatial tactics. Crucially, also, unlike interaction in physical contexts, where people can maintain degrees of privacy even in public (Goffman 1966; Whyte 1988), online, the default is that interaction is public by default, and users of online social media have to make a conscious effort to limit visibility and scales of disclosure (boyd 2014; boyd & Ellison 2008; Papacharissi & Gibson 2011; Trepte & Reinecke 2011).

Communication and digital media scholars Zizi Papacharissi and Paige Gibson point out that in order to participate in online social media one needs to share (2011). Users contribute to the 'obscenity of common opinions and the everyday prostitution of private details' (Lovink 2015: 174) and commodify themselves in a bid to participate.[65] As Laurence Scott notes: 'Social media steers us into co-producing a catalogue of daily rapture.' (2015: xxi) The notion of 'prosumerism' (see for example Coyne 2016: 93; van Dijck 2013: 17) is a particular aspect of online social media that results in users occupying multiple roles simultaneously, as the individual is at once both, consumer and the object

64 Again, Baudrillard commented on these trends and tendencies long before the arrival of online social media, which, nevertheless, seem to have amplified the challenges discussed by him in relation to broadcast media; he argues that 'today we have entered into a new form of schizophrenia – with the emergence of an immanent promiscuity and the perpetual interconnection of all information and communication networks' (1988: 26/7).

65 The commodification of the individual in social media – consumed through images that spread the activities and constructed online image of the individual across space and time – echoes the 'ephemerality and instantaneous communicability over space' described already by David Harvey in his Condition of Postmodernity that express themselves in fads and fashions of consumer societies, and result in the 'commodification of images of the most ephemeral sort' long before the arrival of online social media (1990: 288).

of consumption: 'Interactivity always consists of these two components: action and reaction.' (Lovink 2015: 179) The resulting need for visibility disrupts the 'traditional model of privacy as social withdrawal' hinted at by Palen and Dourish (2003: 135).[66]

Further to the shifting roles users of online social media occupy, they also inhabit rapidly shifting contexts of interaction.[67] As digital communication spans both spatial and temporal distances, interaction increasingly occurs across a range of physical and digital contexts simultaneously beyond the fixity of the city and the interior. Direct face-to-face communication with someone might be complemented by digitally mediated interaction with a wider audience beyond the analog constraints of sight and sound, as captured in the notion of 'poly-social reality' (Applin, Fischer & Walker 2012). Converging contexts of interaction might have differing behavioural requirements (Palen & Dourish 2003) and hinder the anticipation of contexts of reception.[68] Leysia Palen and Paul Dourish outline privacy management as a process of negotiation between a 'public face' and a 'private life' in their paper 'Unpacking "Privacy" for a Networked World' (2003). While preceding the widespread use of social networking platforms, their notion of boundary management in contexts

66 See also Solove, 2009. Already In 1986/7, media philosopher Vilém Flusser speculates on future developments of mass media and shifting notions of privacy: 'Then there would be almost no private space left, namely, a space into which communication cannot penetrate. An omnipresent dialogue is just as dangerous as an omnipresent discourse.' (2002: 20)

67 Film and media scholar Anne Friedberg's description of digital experiences from the point-of-view of the individual – preceding the widespread use of online social media – brings to the fore some of the challenges regarding the shifting positionality of the individual this research concerns itself with: '[Our new mode of perception] is "postperspectival"—no longer framed in a single image with fixed centrality; "postcinematic"—no longer projected onto a screen surface [-]; "post-televisual"—no longer unidirectional in the model of sender and receiver.' (2006: 194)

68 New media scholar Jose van Dijck notes in her publication *The Culture of Connectivity: A Critical History of Social Media*: 'A major change is that through social media, these casual speech acts [commonly shared only with selected individuals] have turned into formalized inscriptions, which once embedded in the larger economy of wider publics, take on a different value. Utterances previously expressed offhandedly are now released into a public domain where they can have far-reaching and long-lasting effects. Social media platforms have unquestionably altered the nature of private and public communication.' (2013: 7)

including information technology appears to be even more relevant today: the computer and information scientists discuss privacy as a *'dynamic* process [-] under continuous negotiation and management, with the *boundary* that distinguishes privacy and publicity refined according to circumstance' (2003: 129*;* original emphasis).[69]

Management of the 'temporality boundary' articulated by Palen and Dourish, in particular, has been affected by shifts brought on by networked online communication. While social mediation allows users to carefully construct image and text that enable self-presentation in a desired way, essentially offering the potential to 'craft' and 'edit' online personas to suit perceived contexts (Krämer & Haferkamp 2011; Turkle 1997), individuals gain degrees of visibility often unintentionally as content remains visible, regardless of its quality and intentions (Papacharissi & Gibson 2011), again resulting in Giddens' 'unintended consequences'.

As indicated here, privacy is context-dependent: a sense of orientation is required to navigate settings and to understand their capacity to manage distance and access, thus enabling the individual to moderate degrees of privacy. Privacy, in turn, is understood as a quality of interaction, while scale, distance and time are identified as the foundational architectural parameters for interaction. One might argue that, in some ways, the notion of privacy as an intuitive understanding of and ability to manage boundaries in interaction is the cognitive manifestation of the foundational architectural parameters of scale, distance and time.

Having outlined the ways in which these architectural parameters relate to challenges of privacy as a quality of interaction, both in analog and digital settings, as well as the ease of orientation, I will give a brief overview of ways in

69 Palen and Dourish's work leans on social psychologist Irwin Altman who articulates privacy as a 'boundary regulation process', through which the individual manages access to themselves in relation to context, and they expand on this to encompass interactions in and across digital settings, beyond physical space as the sole mediator of access, arguing that '[b]oundaries move dynamically as the context changes' (Palen & Dourish 2003: 131).

which architecture has been used to help make sense of the digital. The shortcomings of metaphorical conceptions of cyberspace help to identify the gap that this research aims to address.

2.3.3 The 'Post-spatial' and 'Cyberspace'

As design advocate John Thackara argues, spaces that are 'isolated from the rhythms of the natural world [-] reinforce what philosophers call our ontological alienation, a sense of rootlessness and anxiety, of not quite being real, of being lost in space' (Thackara 2005: 100/1). While he talks about nondescript physical spaces, such as airports, his notion of 'ontological alienation' reflects anthropologist Marc Augé's well-established discourse on the cultural non-specificity of particular transient spaces (1992/2008).

Architectural historian Anthony Vidler's discussion of the 'post-spatial', positioned here as characteristic of digitally mediated social interaction, resonates with Anne Friedberg's notion of 'postperspectival' experience (Friedberg 2006: 194) and is useful to highlight the role of space in framing interaction online:

> [W]e are approaching a state in which neither time nor space holds primacy; a condition of "no-space["]. While this paradigm has been couched until now for obvious reasons in spatial terms—"virtual" space or "cyberspace"—I would contend that these terms are generated in order to think the hitherto unthinkable [-] conditions of life without space, of the spaceless, or of the absolute "void." Even to describe them this way is to engage analogies with our own conventions, conventions that force us, against the grain, to understand the spaceless in spatial terms. Thus a term like "cyberspace" may well, I think, be a hybrid coined out of nostalgia, an attempt to ward off the difficult notion of the spatially absent. [C]yberworlds are being

> construed in spatial terms at the moment when space as we know it no longer holds as a frame for thought. (Vidler 2001: 235/6)

Networked interaction was imagined as an alternative layer to embodied space, 'a kind of parallel universe' (Hamm 2006: 98) and '[e]arly cyberculture was driven by a shared desire to become someone else' (Lovink 2011: 39).[70] Nowadays, in contrast, mobile technology allows digitally mediated interaction to be seamlessly integrated into everyday life, and users are increasingly encouraged to share content across platforms (Papacharissi & Gibson 2011; Scott 2015).[71] As philosopher Luciano Floridi argues in relation to his notion of 'onlife experience', which encompasses the merging of digital online and analogue offline contexts: 'With interfaces becoming progressively less visible, the threshold between *here* (*analogue, carbon-based, offline*) and *there* (*digital, silicon-based, online*) is fast becoming blurred [-].' (Floridi 2014: 43; original emphasis). Online social media, and their impact on the individual user's ability to gauge contexts and scales of interaction, stand in opposition to 'cyberspace' platforms for interaction, mediated by a potentially diverse range of online avatars (Lovink 2011; Turkle 1997).

While conceptions of cyberspace considered settings of interaction as

70 The promise of anonymity granted by online avatars limited the impact of time-space compression, allowing the digital realm to be considered detached from the individual, and granting a degree of freedom from repercussion of online actions. Writing on embodiment and cyberspace, film scholar Margaret Morse notes: '[A] new problematic arises that will surely be explored into the next century: the extension of the malleable virtual body, itself a kind of volume in light, into disjunctive spaces and dissociated temporalities. That is, the bounded entities of the screen and even the volume of screen space known as virtual reality may cease to be of significance in a culture in which the subjectivity and agency, including the capacity for interaction are distributed virtually and unevenly across the material world. [-] Furthermore, the construction and perhaps the nature of subjectivity will change when the body and its personas can no longer be coupled in physical space.' (Morse 1999: 73)

71 Laurence Scott points out the commercially driven motivations behind the unification of people's online identities, also acknowledging the shift away from a diversified sense of identity and avatars in the earlier days of the digital: 'The drive for our online embodiment comes from a civic and commercial conservatism, which, far from the radical possibilities of the early internet, seeks to reproduce real-world notions of personhood, of the stable, predictable, measureable consumer-citizen.' (2015: 27)

detached from a corporeal reality, yet framing interaction in spatial terms, this seems to have been inverted entirely: digitally mediated communication integrates increasingly seamlessly into everyday lives, as spatial reference points that might attempt to nuance abstract streams of interaction appear to have been left behind.[72] Vidler's notion of architecture as a 'remembered fiction' – albeit advanced in relation to memory and mnemonic devices, as uncovered by Frances Yates (1966/2014) – is helpful in this context, and might be applicable in thinking about digitally-mediated interaction. He picks up on the framing role of architecture already outlined here:

> [A]rchitecture acts as a frame for the object or name, and space acts as a positioning device for locating the desired recollection. [A]rchitectural space is a precondition, an invented and remembered fiction for something else, for something potentially forgotten.
> (Vidler 2001: 162)

Pallasmaa proposes architecture as a prophylactic, defending against the 'dispersal threatened by space and time' that philosopher Karsten Harries also talks about in his article 'Building and the Terror of Time' (Harries 1982): 'In a culture where time vanishes, or is exploded, as in our age of speed, the task of arts seems to be to defend the comprehensibility of time, its experiential plasticity, tactility and slowness.' (Pallasmaa 2011: 78; see also Pallasmaa 1998) Reading Pallasmaa in relation to mediated social interaction, the 'comprehensibility' that needs to be preserved, or regained, regards the orientation of the individual, as explored through the design practice discussed later in the thesis.

72 While this research does not aim in any way return to conceptions of spaces of interaction – be they physical or virtual – it explores ways in which the intuitive frame of architectural space might inform thinking about the digital, in particular from the point-of-view of design.

2.3.4 Architectural Metaphors

Architectural metaphors highlight the effort to conceive of the abstract and 'space-less' using architecture as a point of reference, aiming to tame the unknown and abstract and to render it more concrete; architecture is a 'precondition', or a 'remembered fiction' (Vidler 2001: 162) that counters challenges to the 'comprehensibility of time' in a digital age. Cognitive scientists Paul P. Maglio and Teenie Matlock argue that there is a 'natural tendency to metaphorically construe information space in terms of physical space' (2003: 385): in addition to computer interface metaphors (Laurel 1991/2014), one surfs the web, goes to a website and enters and leaves a chatroom (Maglio & Matlock 2003; Matlock, Castro, Fleming, Gann & Maglio 2014). Already in 1997, however, *The Economist* lamented the common use of metaphors to connote the digital, suggesting that '[t]hose who actually used the Internet quickly stopped thinking of any of this as metaphor and simply accepted it as new technology, with new conventions, and a new lexicon of its own', and that, hinting at the familiar, '[m]etaphors are powerful tools to help the uninitiated understand the complex, but they can quickly get in the way' ('Ban Cyberspace' 1997). Nevertheless, the continuing use of such metaphors, from the days of 'cyberspace' through to the age of online social media, indicates the 'general eagerness to find metaphors for the digital revolution', noted by Laurence Scott, a lecturer in English and Creative Writing (2015: 40). Similarly to Andrew Keen (2012), Scott himself frequently resorts to metaphors to illustrate his argument in his book *The Four-Dimensional Human: Ways of Being in the Digital World* (2015).

Cognitive scientist and linguist George Lakoff and philosopher Mark Johnson note in their work *Metaphors We Live By*: '*The essence of metaphor is understanding and experiencing one kind of thing in terms of another.*' (Lakoff & Johnson 1980: 5; original emphasis)[73] However, unlike the rapidly shifting

73 Film and media scholar Catherine Liu, for example, explores individual architectural elements as images and metaphors that give 'conceptual form and shape to the theoretical/historical cluster of concepts that support notions of security and

spaces of online interaction, spatial metaphors of online experiences are rigid and resistant to change.[74] As a result, the recalling of a familiar image substitutes the reality of what it represents only inadequately, such as the metaphor of a room to connote a stream of messages with potentially vast audiences in the 'chat room'; the spatially fixed situations that architectural metaphors evoke do not reflect the shifting scales of interaction and degrees of visibility online sufficiently to aid individual understanding; they fail to render manageable temporal and spatial shifts in mediated communication. Additionally, spatial metaphors rely on the notion of movement between different settings typical of descriptions of the digital since the days of 'cyberspace' (Vidler 2011); however, online spaces, and online social media in particular, shift through the sharing behaviour of others, often without the user's awareness, as already discussed. Architect Juhani Pallasmaa considers architectural metaphors as more experiential and situated, such as the experience of 'homeness' (2011: 120). His understanding of architecture as a container that gives structure and meaning goes beyond a merely metaphorical understanding of architecture, and helps to more fundamentally rethink architectural space in relation to the digital. As human geographers Barney Warf and Santa Aria argue in the introduction to their edited volume *The Spatial Turn*: '[S]pace can serve as a window into different disciplines, a means of shedding light on what separates and what unites them.' (2009: 2)

The efficacy of space in aiding the negotiation of distance relationships and degrees of visibility that has given rise to spatially conditioned notions of

autonomy and have become indispensable to explorations of the value of privacy and private life' (Liu 2011: 203) in a paper on the public-private dialectic at the beginning of the twenty-first century. She uses walls, windows and alcoves metaphorically, providing a starting point to make challenges of interaction online more tangible.

74 The critique of architectural metaphors presented here differs from the use of metaphor in design processes (Coyne 1995; 2005). Architect and digital media scholar Richard Coyne argues: 'Technology functions as a source of metaphors, and technologies are understood metaphorically through other phenomena. Metaphors, problems, and technologies are interrelated. [-] Finally, metaphor provides a means of evaluating technologies.' (1995: 286)

privacy does not appear to translate easily into metaphorical images for mediated social interaction. The refuge sought in spatiality has affected the way digital settings and interaction are talked about superficially, and not yet the way it is thought about and acted upon through design. Referring to Kevin Lynch's seminal work on aiding orientation in *The Image of the City* (1960), Stan Allen concedes that 'the most significant new effects [of technology] in the city are not registered as images' (2009: 59) and argues:

> In order to map this unmappable territory, the conventions of representation itself need to be rethought. If architecture is to work beyond the level of image it needs to invent new tools to work more effectively within the immaterial networks and systems that comprise the city in the late twentieth century. In order to sustain its own relevance, architecture needs to address the social and political implication of the shift from artifact to effect.
>
> Traditional representations presume stable objects and fixed subjects. But the contemporary city is not reducible to an artifact. The city today is a place where visible and invisible streams of information, capital, and subjects interact in complex formations. [-] In order to describe or to intervene in this new field architects need representational techniques that engage time and change, shifting scales, mobile points of view, and multiple programs. (2009: 59/60)

His call to rethink conventions of representation and to shift architectural practices helps to underpin this research. Further, John Thackara's argument that '[a]rchitecture lacks a pleasing spatial language for flow-based contexts' (2005: 106) encourages the development of approaches not only for dealing with the experience of disorientating physical spaces, such as the airports he talks about, but also the digital realm of rapidly shifting contexts of interaction and fluidly varying distance to others.

2.4 THE GAP IN THE LITERATURE AND RESEARCH OPPORTUNITIES

This final section of the Literature Review articulates the gap the research aims to address, framing it as an opportunity for inquiry, and moves this research and its spatial practice beyond conventional forms of representation to test the efficacy of architectural design practice in challenging the digital. The thematic concerns of this inquiry – privacy and the managing of interpersonal distance – are dealt with in the field of proxemics, defined by anthropologist Edward T. Hall as 'the study of how man unconsciously structures microspace—the distance between men in the conduct of daily transactions, the organization of space in his houses and buildings, and ultimately the layout of his towns' (Hall 1963: 1003; see also Hall 1969).[75] While the phenomena proxemics deals with 'are hard for the speaker to consciously manipulate' (Hall 1963: 1003), design here is used as a means to actively interrogate shifts to inherited understandings of the distancing capacity of space and related notions of privacy. The practice-led approach firmly situates this inquiry within the realm of design research.

The three architectural parameters of scale, distance and time, which have been identified through this review of the literature, map across two areas of concern: the clear understanding of inherited notions of privacy, in the design domain of architecture; and the challenges presented by digitally mediated communication in the design domain of communication design. Both design domains are concerned with the framing of experience – the former largely in an embodied way and the latter predominantly through representation.

75 Communication scholar John A. McArthur expands the study of the use of space set out by Hall to encompass the impact of technology on human interaction. This resonates also with the notion of the 'tuning of place' proposed by architect and digital media scholar Richard Coyne (2010) in his discussion of 'synchronisation' and 'microadjustment' in the navigation and use of physical space and pervasive digital technology.

However, there is a missing link between the two – or quite literally a gap – in the lack of means for the clear architectural understanding of privacy in physical space to bear upon the framing of digitally mediated interaction and the aiding of individual orientation online (Fig. 4).

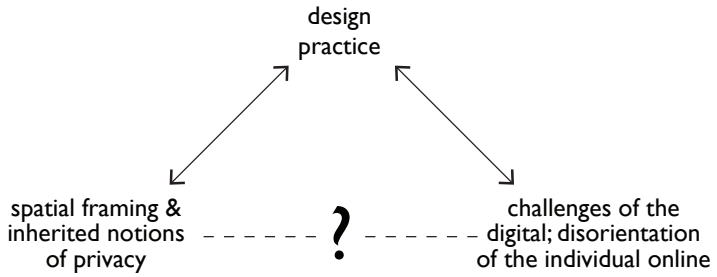


Fig. 4:
The gap in the literature

As the Literature Review has explored, the disorienting effect of scale that risks jeopardising the integrity of the individual – experienced already in Simmel's metropolis – is prominent again in digital contexts of interaction, amplified in particular by the shifting effects of the variable of time that manifests in the 'timelessness' and 'continual present' of social media streams. The fluidity of time as a key parameter of experience poses a challenge for the managing of distance relationships and orientation of the individual in online settings and demands strategies for negotiating new realms of interaction with others: spatial tactics, physical devices moderating interaction and the process of impression management are lacking in digitally mediated interaction, as attested by social media mishaps that are the unintended consequences of misgauged social contexts and unclear scales of interaction. At the same time, architectural metaphors, called upon to comprehend new concepts and modes of interaction, over-simplify the complex role that architectural space can play in negotiating interaction; in order to be accessible, they rely on architecture as a static image that does not respond to the shifting of online contexts of interaction, as already discussed.

As outlined here, architecture has not yet found an adequate means of

responding to the ontological challenges that digitally-mediated interaction presents for the individual through design. Online social networking platforms strive to enhance connectivity, yet little attention appears to be given to individual 'boundary management' and privacy has become a 'luxury commodity' online, where individual agency in contexts of interaction relies on digital literacy (Papacharissi & Gibson 2011). At the same time, instead of considering what the well-understood realm of architecture might be able to bring to conceptualisations of the novel territory of the digital, contemporary architectural discourse in relation to the digital advocates pervasive and situated computing interfaces and the merging of architecture with interaction design (Dade-Robertson 2011; McCullough 2005; Wiberg 2015)[76]. It also takes an interest in the impact of digital processes on architecture and the built environment – conceptually (Angelidakis 2010; Leach 2009; Novak 1991), formally (Colletti 2010; Schumacher 2011 & 2016) and in terms of production (Kolarevic 2003; Rocker 2006; Schodek, Bechthold, Griggs, Kao & Steinberg 2005; Schumacher 2017); however, these processes and trends are also viewed critically (Davis 2010; Gage 2016; van Schaik 2014). Anthony Vidler's promise of architecture as a precondition for virtual environments currently largely applies to the use of architectural metaphors, not, however, to architectural design practice in association with the digital.

The challenge identified here therefore is two-fold:

1. Design does not have a sufficiently coherent conceptual foundation to aid the understanding of the position of the individual in digitally-mediated interaction.

76 Architect Martyn Dade-Robertson's cognitive model of a 'navigational schema', for example, focuses on the role of architecture and architectural metaphor in the screen-based representation of information (2011); while the focus and application of his work differs significantly from the research discussed here, it also has to articulate 'what an architect can bring to the table' in interdisciplinary contexts engaging with the digital (2011: 21) and operates 'through the lens of architectural design' (2011: 150).

2. Architectural design practice lacks appropriate means to engage with the challenges of the digital through its own lens.

Beyond being common to the framing of individual experience through architecture and communication design, the architectural parameters underlie architectural representation as the core of architectural practice, as has been discussed in detail in the first section of this Literature Review. Architectural representation therefore presents an opportunity for research through design, in which it is instrumentalised to mediate between the design domains of architecture and communication design. The research design behind this approach will be outlined in detail in the following Methodology chapter (Chapter 3).

This research focuses on architectural design practice as a means of thinking about the digital.[77] This is reflected in the spatial turn in other disciplines (Soja 1989; Tally Jr. 2013; Guldi n.d.)[78] in what Vidler calls the 'readoption of spatial models by other disciplines from literary criticism to geography' (Vidler 2001: 235).[79]

In considering digitally-mediated interactions from a designerly point-of-view, the investigation aims to offer means of better relating architecture to the swiftly fluctuating contexts of online social media and other digital settings. In his publication *Digital Ground*, Malcolm McCullough puts forward an architecturally-informed theory of context for digital interaction design; his view on architectural space as a 'framework for social conduct' (2005: 40) is a useful

77 Reflecting on her own practice, Jane Rendell notes: 'Elsewhere I have explored how cultural geography and other allied fields have, over the past 30 years, continually sought to discover unfixed or relational qualities in given spatial terms so demonstrating that space is an active ingredient, not a passive backdrop, in social and cultural life (Rendell 2006: 15-20).' (Rendell 2011: 173)

78 Forthcoming publications, such as *The Question of Space: Interrogating the Spatial Turn Between Disciplines*, edited by Marijn Nieuwenhuis and David Crouch (Rowman & Littlefield Publishers, Oct 2017), are testament to the saliency of this continuing debate across disciplines.

79 The research presented here, however, goes beyond 'the introduction of the concept of space into the discourse of a particular discipline' (Stanek 2012: 49) that might be expected of a 'spatial turn', and aims to render underlying principles and methods of architectural practice available to designers engaging with abstract challenges of the digital.

foundation also in the context of this research, building on the framing and specialising role of architectural space already discussed.[80]

The variables of scale, distance and time, common to online interaction as well as to architectural representation, map across all aspects of the research: from the initial kernel of online privacy, through the wider literature already explored, to the design research methods, that will be discussed in the next chapter. As parameters of architectural representation, the variables allow for the development of a range of architecturally-informed methods that might offer means of responding to challenges of the digital – saliently exemplified by increasingly fluid notions of privacy online – and to reframe challenges of the digital through design practice, rather than merely aiming to absorb them within physical space. The following chapter will frame architectural representation as a methodology for research involving practice, and outlines methods of spatialisation to develop spatial designs that can operate as thinking mechanisms, oriented towards the digital.

80 Dade-Robertson also notes: '[O]ur embodied manifestation has had significant implications for the way in which we interact with even the most dematerialized of information and how we shape our abstract experiences with reference to our physical experiences.' (2011: 149/50).

3 METHODOLOGY

This chapter outlines the research design, or methodological approach, for inquiry. Architectural representation is proposed as the methodological umbrella, understanding methodology as the study of methods, as well as the means of taking position in research that enables the development of new methods and reflection upon their use (Cross 2001). This is followed by detailed discussion of the methods of inquiry and the design methods informing the design projects underpinning this research.

While the inquiry is practice-led (Candy 2006; Rendell 2004; Rust, Mottram & Till 2007),[81] it is crucially informed by theory. In the review of the literature, I explored the foundations of this research: architectural representation, spatially-conditioned notions of privacy and the role of spatial reference points in a digital age.

The model for research presented here takes advantage of the openness of architectural design research, advocated by Jane Rendell, and its potential to differ from 'normative research processes' (2007).[82] The practice-led investigation focuses on my own design practice through processes of reflection on individual design processes, the range of design outputs, and crucially the iterative

81 Chris Rust, Judith Mottram and Jeremy Till offer a wide definition of practice-led research in their report 'AHRC Research Review: Practice-Led Research in Art, Design and Architecture': 'Research in which the professional and/or creative practices of art, design or architecture play an instrumental part in an inquiry.' (2007: 10) The educators further concede that practice-led research might 'concentrate on how issues, concerns and interests can be examined and brought out by production of an artefact' (2007: 12).

82 According to Rendell, 'architectural design research is of value precisely because it offers forms of enquiring, understanding and knowing, which differ from and often question normative research processes, deriving from the sciences as well as the arts and humanities' (2007: 4).

process of inquiry that the design projects form a part of; the research methods are key to framing the design methods and the emerging spatialisations as part of this iterative process and will be introduced upfront.

The methodology of architectural representation as the frame for the investigation enables the mapping of the architectural parameters of interaction across both the architecturally-informed methods for research through design and the research theme of the disorientation of the individual in online settings. Based on the capacity of representation to ask questions about what is represented (Ewenstein & Whyte 2009), newly formulated modes of representation are tested as design methods, framed by methods of inquiry, to interrogate a series of conditions of the digital affecting orientation online, and to arrive at new readings thereof: three methods of spatialisation – miniaturisation, immersion, and mapping – inform a range of design projects on a range of scales from miniature objects, through immersive spaces and installations, to scale-representations of conceptually larger objects on the scale of the neighbourhood. These are spatial representations of the intangible streams of information online that embody the experiential potential of architectural representation based on the parameters of scale, distance and time. Emerging as diagrammatic devices for thinking, here called 'spatialisations', the design projects are framed using social scientist Donald Schön's notion of the 'design situation' as method, and re-orient the subject through manipulating the variables of scale, distance, and time.

With regards to the overall research theme of the digital, this subject is the user in online social media. In the context of this design-driven research, however, the viewing subject engaging with these new forms of representation is me as the designer-researcher (Findeli et al. 2008), engaging in processes of reflection that expand on Schön's seminal work on *The Reflective Practitioner: How Professionals Think in Action* (1983/1991). Schön's particular interest in architectural design practice and his point that architecture 'is perhaps the

oldest recognized design profession and, as such, functions as prototype for design in other professions' (Schön 1983/1991: 77) support the approach taken here, which eventually leads to the development of an architectural framework for dealing with the disorientation of the individual online. Similar to Schön's studies, this research aims to reach beyond the domain of architecture; through the methodological vehicle of architectural representation, it uses the overall theme of individual orientation and shifting of privacy online to position architectural practice in relation to the digital.

Following the outline of the research methodology, this chapter introduces the methods of inquiry that enable the deployment of design methods, discussed thereafter, in a range of design projects, which will be presented in the following chapter (Chapter 4) and form the core of the practice-led research. In considering the process of research presented here, it is important to bear in mind the mutual influences of theory and practice that have characterised the journey.

3.1 THE METHODOLOGY OF ARCHITECTURAL REPRESENTATION

Architectural representation is the methodological vehicle for this inquiry into means of orienting the individual in digital settings of interaction. It brings together the foundational architectural parameters, crucial to framing experience and interaction, with the architecturally-informed methods of spatialisation as the basis for this practice-led inquiry. The aim is to address the current disjunction between intuitive understandings of physical spaces and conceptions of digital settings, in relation to individual disorientation, disrupted notions of privacy online and their unintended consequences, as discussed already.

While some scholars use the terms methodology and method seemingly interchangeably (Lucas 2016), Alain Findeli et al. note that 'one of the main purposes of methodology is to identify the method(s) best fitted to carry out the research activity in a given field or discipline, and to justify that choice' (2008: 68).[83] The methodology thus is my means of taking position and orienting my own practice towards the digital as the object of research, and forms the basis for a broader theoretical position regarding the role that the expertise of the architectural designer can play in the domain of the digital.

Nigel Cross' understanding of the study of design as 'design methodology' – 'the study of the principles, practices and procedures of design' – is useful in articulating the approach taken here. Citing his own work, Cross argues:

> For me, design methodology "includes the study of how designers work and think, the establishment of appropriate structures for the design process, the development and application of new design

83 They further point out: 'By "methodology" is meant the science of methods, *i.e.* the very general field of inquiry dealing with the identification, description, comparison, implementation, validation and criticism of methods.' (Findeli et al. 2008: 68)

> methods, techniques and procedures, and reflection on the nature and extent of design knowledge and its application to design problems." The *study* of design leaves open the interpretation of the *nature* of design. (Cross 2001: 53; original emphasis)

The study of practices of architecture presented here – located within the wider field of design (Schön 1983/1991) – falls within Cross' framing of design methodology. His clear delineation between '*study*' and '*nature* of design' further helps to delineate this practice-led inquiry framed by research methods borne out of reflective practice against semiotic approaches to research.[84]

The role of architecture here is to tame the 'unmappable territory' (Allen 2009: 59) of the disorienting digital realm, which in its complicated distance management, expansive scales of interaction and shifting notions of privacy resembles Simmel's metropolis and its challenges to the integrity of the individual. Architectural representation is positioned as a response to Allen's speculation:

> If architecture has lost its historic capacity to fix and determine the limits of urban space and territory, are architects left to work exclusively with images? Or is it possible to accept the reality of this new condition, and to creatively reinvent the tools of the discipline in order to meet these new challenges? (Allen 2009: 59)

The methodology of architectural representation is key to this practice-led approach to reorienting architectural practice towards challenges of the digital and grounds the research within professional expertise. As Henk Borgdorff, Professor of Theory of Research in the Arts, points out: 'Methodologically

84 Rendell also notes: 'Research "through" architecture takes the design process as the research methodology. The focus of such practice-led research in architecture can be on product or process.' (2004: 144)

speaking, the creative process forms the pathway (or part of it) through which new insights, understandings and products come into being.' (2011: 46)[85] In the same manner that artistic research suggests that practice is not merely a result, but also the 'methodological vehicle' of research, as outlined by Borgdorff, unfolding '*in and through* the acts of creating and performing' (2011: 46; original emphasis), the research presented here unfolds in and through processes of architectural representation, emphasising the 'paramount place that artistic practice occupies as the subject, method, context and outcome of the research' (2011: 46). Narrowing the inquiry and firmly rooting my approach in my own disciplinary expertise, the methodology of architectural representation focuses on particular characteristics and techniques of architectural practice and frames a trio of architecturally-informed methods for research through design. A range of spatialisations as newly articulated forms of representation form one of the outputs, as witnesses to the methodologically-driven process of research, informing the key outcome of the inquiry.[86]

As will be discussed in detail in the concluding chapter of this research (Chapter 6), the approach taken here benefits the wider field of design research through the development of the architecturally-informed framework for research through design at the intersection of architecture and communication design.[87] It further benefits the design domain of architecture through widening

85 In contrast to Borgdorff's discussion of contemporary art practice, which, he argues, 'constitutes the relevant context for the research, alongside the academic forum' that produces 'new products and experiences which are meaningful in the world of art' (2011: 46), the research presented here expands beyond the context of architecture as the home territory of the creative processes investigated, and tests the efficacy of architectural representation in interdisciplinary contexts.

86 While Borgdorff outlines architectural theory as belonging to a tradition aligned with the humanities that approach the arts with 'theoretical distance', his characterisation of artistic research as one where 'the experimental practice of creating and performing pervades the research at every turn' (2011: 48) resonates strongly with the practice-led approach taken here. He further notes the importance of 'guiding intuitions and chance inspirations' (2011: 55) in processes of research and points out: 'Research is more like exploration than like following a firm path.' (Borgdorff 2011: 57)

87 Rendell observes that 'in interdisciplinary research individuals operate at the edge and in between disciplines and in so doing question the ways in which they usually work' (Rendell 2004: 145).

its context of application.

While Cross makes the case for forms of knowledge that are 'independent of the different professional domains of design practice' (2001: 54), this practice-led inquiry explicates some of the particulars of architectural design practice, of which representation is the key mode of operation, to inform wider design practices and discourse, where the key parameters that frame interaction might not be as intuitively understood or ingrained as in architecture.[88] Schön's way of 'think[ing] of architectural designing as an exemplar of knowledge and reason in other professions' (Schön 1988: 181) is fundamental to the methodological framing for research into architectural practice in association with the digital. Instead of architecture being an 'importer' of ideas and practices from other fields,[89] enhancing its own discipline (Rendell 2011; Troiani & Ewing 2014; see also Picon & Ponte 2003), the practice-led, interdisciplinary research 'exports' approaches and ways of thinking familiar to architectural practice for the benefit of other design domains.

Cross' view that 'design practice does indeed have its own strong and appropriate intellectual culture, and [that] we must avoid swamping our design research with different cultures imported either from the sciences or the arts' (Cross 2001: 55) supports the approach taken in this research, focused on building ways of working that are inherent in, and intuitive to, architectural design practice; underlying principles are extrapolated and made available to a broader set of design domains by means of the framework, exporting them, rather than importing from wider fields, as architecture tends to do, as discussed already. The approach taken here follows the assertion that Professor of Design William Gaver's makes in his paper 'What Should We Expect

88 However, Paul Emmons' observation indicates that, while scale might be deployed intuitively in architectural design practice, its role might benefit from clear and conscious articulation: 'Scale's presence in architecture is so enormous that it is almost imperceptible.' (2007: 65)

89 Architecture and technology historian Antoine Picon highlights that metaphors from the sciences have been brought into architectural discourse to enhance the latter; see Picon 2003.

From Research Through Design?', that 'theory should be allowed to emerge from situated design practice' (2012: 942).[90] The following section outlines the interdisciplinary and interorganisational context of the CX, within which this inquiry has been developed.

3.1.1. Interdisciplinary Collaboration through the Creative Exchange

The approach to research taken here and the design practices at the intersection of architecture and communication design have been influenced strongly by the contexts of the AHRC's Creative Exchange Knowledge Exchange Hub and the RCA's School of Communication that have framed this practice-led inquiry, as already noted in the Preface. These contexts encourage the close examination and clear articulation of principles of architectural practice, as well as the development of means to orient these towards the digital across disciplinary boundaries.

The CX enables the development of a research agenda that tests my own disciplinary expertise in association with the digital. The projects that form the backbone of the research have come about as a mixture of theoretical inquiry and collaboration with other academics and professionals in the creative industries (Fig. 5). This has allowed the testing of approaches and methods in wider cultural, professional and interorganisational contexts (Dalton, Simmons & Triggs 2017).[91] Collaboration is essential in the field of architecture, which sees architects working alongside a range of consultants, as well as clients and, as Ray Lucas notes, it also is common to architectural research (2016). Working

90 His paper focuses on design practitioners integrating with the HCI research community; however, the principles he sets out regarding research through design are applicable also in the context of this research.

91 As fellow PhD candidate Ben Dalton, supervisor Teal Triggs and Tom Simmons, Research Lead in the RCA's School of Communication, note in discussing approaches to doctoral research developed within the CX: 'Inter-organizational collaboration can be thought of as extending interdisciplinary research approaches. Interdisciplinary research emphasizes dialogue and exchange across university departments and fields of thought.' (2017: 67)

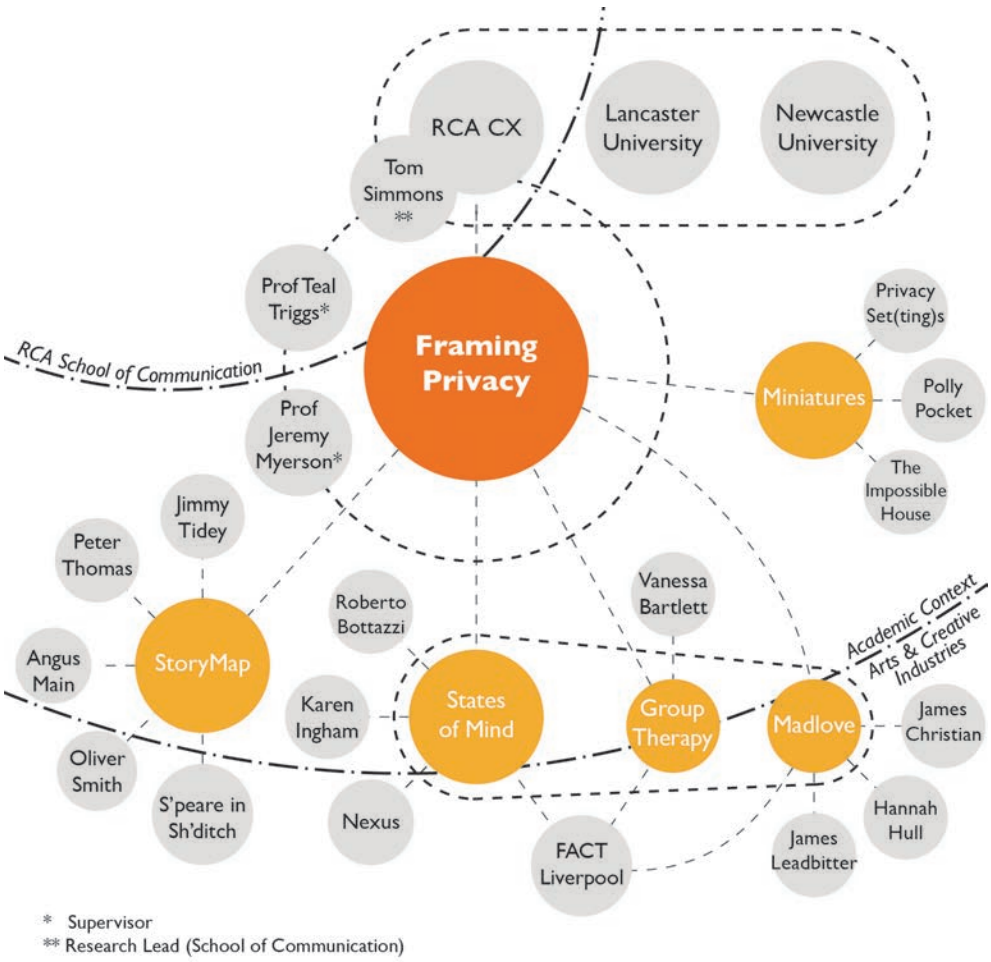


Fig. 5: The CX network

with collaborators from varying backgrounds and complementary skill-sets to develop projects affords me the opportunity to concentrate on the application of my architectural design expertise to act upon challenges of the digital through a range of prototypes, without requiring 'digital augmentation' of my own skill-set in order to work in digital contexts. Further, exchange with other researchers and collaboration, in which project partners are involved in processes of reflection, have enriched evaluation, leading to 'conscious forms of knowing' (McIntosh 2010: 47).

While the theory and methods driving this research, discussed in the Literature Review (Chapter 2), are firmly rooted in the realm of architecture, the practices at its heart expand disciplinary boundaries and draw in collaborators from a range of backgrounds, including filmmaking, software development, physical computing and applied linguistics. This furthers the repositioning of architectural representation to address challenges of the digital beyond the

design domain of architecture and has been instrumental in identifying what elements of architectural strategies and ways of thinking can contribute to a rethinking of the digital beyond the conventional remit of architecture.

Dialogue and exchange through the interorganisational platform of the CX – within the team at the RCA, with partners at the Universities of Lancaster and Newcastle, as well as with collaborators on design projects – require clarity of intent and a clear articulation of processes. Project briefs play an important role in the exploration of architectural representation in expanded and collaborative design contexts and have helped to focus the research. Developed in conversation with project partners, the briefs are driven by my own research agenda and the interest in developing means of framing individual experiences online. The collaborative projects problematise a range of concerns, such as the sharing of personal content in public cultural settings, that have been instrumental in relating the projects and their outcomes back to my overall research agenda: without having to foreground architecture and privacy online as core issues at the heart of the collaborative project, the briefs ensure that it contributes meaningfully to the overall research. At the same time, the clear framing of objectives through the brief allows projects to flourish in their own right and in ways that are of value to collaborators, as well as the wider agenda of the CX in exploring mechanisms of knowledge exchange, beyond this inquiry.

Beyond providing the overall context in which this research has been developed, the CX parallels the inquiry presented here in the interrelationship of content and mechanisms of exploration: its wider investigation of mechanisms of knowledge exchange centres on the thematic focus of Digital Public Space; in contrast, this inquiry centres on the research theme of privacy online, and explores architectural representation through the practice-led inquiry (Table 2).

	CX: Digital Public Space	***PhD: Framing Privacy***
Thematic Focus	Investigation of Digital Public Space	Investigation of notions of privacy online
Practical Focus	New forms of Knowledge Exchange for academia, industry and communities	Architectural representation tested in interdisciplinary and interorganisational context of CX
Outcomes	1. New products & services for commercial, social and community value 2. New PhD model for the Arts and Humanities 3. New doctoral-level hybrid researchers	Framework of Architectural Representation for design and research in association with the digital

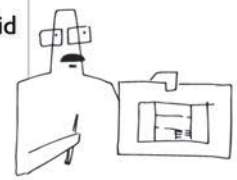


Table 2: Parallels in approaches to research between CX Hub and doctoral research

3.2. METHODS

Having outlined the wider methodological frame for this investigation, this section will discuss both research and design methods. The research methods are introduced first, as they are key to enabling the design projects, discussed in Chapter 4, that form the backbone of this thesis to be framed as pieces of research, beyond generating design outcomes; these methods of inquiry are key to assessing the impact of the architecturally-informed design methods that drive the projects. The design methods, in turn, highlight how the key foundational parameters of architectural representation underlying the formulation of these methods help to reconsider the orientation of the individual within digital spaces. Reframing conventional methods of architectural representation to focus on their manipulation of the architectural parameters in the design process, instead of being determined by the architectural output format, they are rendered accessible to a wider design audience.

Donald Schön's notion of the 'design situation' and his method of reflection are introduced as the key methods of inquiry that enable the framing of the range of design projects as pieces of research. Privacy, as the intangible content of the investigation, and the foundational architectural parameters of scale, distance and time that present a set of common elements weaving through the research, form the core of the appreciative system that enables the evaluation of the use of the design methods in the range of design projects.

Forms of architectural representation, as explored in the review of the literature in the field (Chapter 2), intuitively manipulate the architectural parameters of scale, distance and time; yet, as abstract means of anticipating space, they struggle to communicate the experiential dimension of it. As John Thackara argues:

> Building plans, of the kind you find in an architect's office, say almost nothing about the quality of our interactions in complex technical

> spaces like transport hubs or high-tech offices—the operating environment within which space, electronic signals, and people interact with one another continuously on a global scale. (2005: 101)

The next chapter (Chapter 4) will discuss in detail how the design methods of miniaturisation, immersion and mapping are put into practice in the range of six design situations that capture experiential and relational challenges of mediated interaction by focusing on the *process* of making these tangible and experiential, without adhering to predetermined output *formats*.

3.2.2 Research Methods

This section outlines the central research methods that enable the positioning of design methods and the outcomes of creative practice to be utilised as pieces of research. The methods of inquiry build on Donald Schön's studies of design processes in professional and educational contexts (1983/1991; 1988; 1992; Schön & Wiggins 1992), and are expanded for this research through design rooted in processes of reflection and the notion of the 'design situation', the design outputs of which are the physical manifestation of intangible challenges presented by digital environments.

The body of design projects discussed here presents multiple design situations. Unlike case studies, for example in the social sciences, the research does not present the study of pre-existing cases. Generating physical abstractions of challenges of the digital by means of individual 'design situations', the design process instead is used as a means of 'problem setting' that generates new situations allowing for reflections on these issues. In this, these situations afford degrees of control over the parameters that guide behaviour within the situation, more typical of social science experiments than of case study research (Robson 2002; Yin 2009). Following Henk Borgdorff's assertion that '[a]s a rule, artistic research is not hypothesis-led, but discovery-led' (2011: 56),

design situations build on the capacity of epistemic objects to raise questions (Ewenstein & Whyte 2009). Emancipating themselves from concerns over distinctions between research *into*, *for* and *through* design that have dominated the design research literature (Frankel & Racine 2010; Frayling 1993/4; Friedman 2008), Findeli et al. note:

> Proper research *through* design could [-] be defined as a kind of research *about* design [more] relevant for design, or as a kind of research *for* design that produces original knowledge with as rigorous [and demanding] standards as research *about* design. (2008: 71; original emphasis)[92]

The design situations presented in this thesis are instrumental in processes of 'thinking-through-design', which expand on the work of Henk Borgdorff (2011; 2012). Designed artifacts as outputs of this process initially operate as instruments to reconceptualise notions of online privacy and orientation in digitally mediated settings, emphasising spatialisations as design outputs; more broadly, however, the sequence of design situations seeks to identify architectural design tactics that find application in contexts beyond architectural practice, foregrounding the design process as the object of research. Using the spatialisations emerging from the design process as a lens onto the digital, knowledge is gained regarding the role of architectural representation in taming the disorienting realm of the digital.

The framing of design practice in design situations and reflection thereupon are instrumental in informing the framework of architectural representation for

92 In her discussion of 'Architectural research and disciplinarity', Jane Rendell 'proposes an interdisciplinary model that [-] explores the boundaries of disciplinary knowledge to allow for the production of complex forms of research that are at once self-reflective and propositional. It is at the intersections between disciplines where the tenets of normative architectural design are being questioned through the creation of innovative research methodologies.' (2004: 146)

addressing challenges of the digital with a focus on the individual; the design situations explore the role of the foundational architectural parameters of scale, distance and time in negotiating relationships between the materials brought together within them and offer an exemplary account of the testing of the newly formulated design methods of spatialisation; as Gaver points out:

> Design examples are indispensible to design theory because artefacts embody the myriad choices made by their designers with a definiteness and level of detail that would be difficult or impossible to attain in a written (or diagrammatic) account. (2012: 944)

3.2.2.1 Design Situations

The method of the 'design situation' presents a means of framing the practice underlying this research that allows the gradual introduction and testing of a range of 'materials', including the architectural variables identified through the review of the literature.

Donald Schön's notion of the 'design situation' is part of a process of 'problem framing', or 'problem setting', and a key component of expert design practice (Cross 2004; Schön 1983/1991; 1988; 1992; Schön & Wiggins 1992): 'Problem setting is the process in which, interactively, we *name* the things to which we will attend and *frame* the context in which we will attend to them.' (Schön 1983/1991: 40; original emphasis) He later notes that 'a "problem space" is not given with the presentation of the design task: the designer *constructs* the design world within which he sets the dimensions of his problem space and invents the moves by which he attempts to find solutions' (Schön 1992: 141/2; original emphasis).[93] The designer responds to the problems through a range of reflective move-experiments at the heart of his theory of

93 'Through active sensory appreciation of actual or virtual worlds (especially [-] by drawing), the designer constructs and reconstructs the objects and relations with which he deals, determining "what is there" for purposes of design, thereby creating a "design world" within which he functions.' (Schön 1992: 132)

reflective practice, in which decisions are made and assessed in turn, leading to Schön's understanding of 'designing as a reflective conversation with the materials of a situation' (Schön 1992: 133).[94]

Problem framing and the construction of a design world is crucial to this research through design practice. The design projects discussed in the following chapter focus on particular aspects of digital experiences that are framed as problems through my own design practice in terms that can be addressed through architectural design practice. In this, the design situations echo Jane Rendell's position on architectural practice in relation to problems encapsulated within briefs: 'Architectural designs that put forward questions in response to a brief, instead of, or as well as, solving the problems posed by that brief, produce objects and situations that critically rethink the parameters of the problem itself.' (Rendell 2007: 4) The design projects presented here rethink the qualities of digital experiences and interaction they make tangible by means of spatialisation. Helping to set the parameters and constraints for the investigation, this 'problem setting' resonates with the 'resituation' away from the virtual and into the analog sphere inherent in the design processes of spatialisation tested here. As Gaver points out, 'formulating the situation is integral to addressing it' and design 'is *productive* in the sense that it changes the context of its own activities' (2012: 940). In the paper on 'Expertise in Design: An Overview', Nigel Cross further makes reference to 'designing as a "situated" act—that is, that designers invent design issues or requirements in a way situated in the environment in which they design' (2004: 437).

In the conclusion to his *Reflective Practitioner*, Schön discusses the relationship between research and practice as intertwined, arguing that 'the exchange between research and practice is immediate, and reflection-in-action is its own implementation' (1983/1991: 309).[95] While in his model of reflection

94 To quote in full: 'This process of seeing—drawing—seeing is one kind of example of what I mean by designing as a reflective conversation with the materials of a situation.' (Schön 1992: 133)

95 To quote in full: '[R]esearch is an activity of practitioners. It is triggered by features

the problem may either be framed as one of making, or of understanding something, he argues that, '[h]owever the problem is initially set, in the later stages of inquiry both making and understanding interests come into play' (1983/1991: 268). Similarly, in the context of this research, the overall aim of enhancing means of orientation is inseparable from the design processes and resulting artifacts and spaces that manifest as instances of the process of practice-led research.

Expanding on Schön's work, the focus of reflection is not on the epistemic design process of producing artifacts and environments that respond to conditions of the digital in isolation, but on the ways in which a range of 'design situations' in conjunction are able to frame the challenges of the digital, leading to a wider rethinking of architectural practice in relation to the digital. The notion of the 'design situation' here is considered on several levels: as an iterative process of challenging the digital through spatialisations as new forms of architectural representation that are produced as tangible manifestations of particular dynamics observed online, the overall process of research through design here is viewed as a situation that I as the researcher am in conversation with; as a 'repertoire of prototypes' (Schön 1992: 142) individual design situations form part of the overarching process of inquiry. Each project in turn might be considered as a move within the wider process of research that is reflected upon. The notion of the 'design situation' thus is expanded to encompass both, the design process as studied by Schön, as well as the design outcome as part of the research process of problem setting and subsequent knowledge development.

> of the practice situation, undertaken on the spot, and immediately linked to action. There is no question of an "exchange" between research and practice or of the "implementation" of research results, when the frame- or theory-testing experiments of the practitioner at the same time transform the practice situation. Here the exchange between research and practice is immediate, and reflection-in-action is its own implementation.' (Schön 1983/1991: 309)

3.2.1.2 Reflective Practice

The focus of reflection here is on the ways in which the foundational architectural parameters of scale, distance and time come into play when making decisions in the deployment of the design methods of miniaturisation, immersion and mapping. The reflective cycle goes beyond the cycles of individual projects, and applies to the whole research: knowledge emerges through reflection on the whole sequence of design projects across the range of scales, and is guided by the research questions in relation to the overarching theme of privacy. The critical rethinking of the parameters of a particular project and the challenges it foregrounds through this reflection are key in developing each following project within the sequence of design situations.

Schön explains how the reflective practitioner operates within design situations:

> He [the designer] shapes the situation, in accordance his initial appreciation of it, the situation "talks back," and he responds to the situation's back-talk. In a good process of design, this conversation with the situation is reflective. In answer to the situation's back-talk, the designer reflects-in-action on the construction of the problem, the strategies of action, or the model of the phenomena, which have been implicit in his moves. (Schön 1983/1991: 79)

In his work, designing is understood 'as a reflective conversation with the materials of a situation' (Schön 1992: 133). There are two layers to this reflective conversation. Firstly, the design process is interrogated in the context of the overall research, in particular with regards to the design methods of miniaturisation, immersion and mapping and their capacity to manipulate the foundational architectural parameters of scale, distance and time. Secondly, the outcomes of design processes are interrogated, testing how a spatialisation

enables me as the reflective practitioner to think differently about the aspects of the digital it represents, considering the designed outcome as a lens on to the digital that brings these foundational parameters to reconsiderations of the digital, focusing on the positionality of the individual.

The wider process of designing that Schön talks about as 'a reflective conversation with a design situation' (Schön 1992: 142), due to its fuzziness might be considered less of 'a new "practical" theory of designing' and instead as 'a "primer" for a new theory of problem solving in practice' (Roozenburg & Dorst 1998: 40) and helps to inform the framework of architectural representation that emerges from this research.

The foregrounding of professional architectural experience and the reorientation of expertise within a new domain of application that it enables – the realm of the digital – are key to the design situations that form the core of this research and lead to the development of the framework of architectural representation.

3.2.1.3 Appreciative System: Privacy, Orientation and Architectural Parameters

Privacy itself as the subject matter of research is slippery and in-flux, as has been discussed already. Challenged by shifting scales of interaction, ambiguous degrees of visibility, and the retrospective accessibility of content, it constitutes a 'real world symptom' (Latham 2017)[96] of the challenges brought about by digitally mediated interaction. As such, it forms a key component of the 'appreciative system' (Schön 1983/1991; 1992) to evaluate the impact of the methods of spatialisation in rethinking notions of individual privacy and helps to drive the development of the architectural framework for engaging with challenges of the digital. The challenges to inherited notions of privacy that form the underlying theme of inquiry are positioned in relation to the experiential parameters

96 Social scientist John Latham describes 'real world symptoms' as part of the problem setting within his 'Research Methods Framework' (Latham 2017).

of architecture, which are common to both, the challenge the research aims to address and the key means of doing so, by means of the design projects.

Schön discusses the reflective practitioner's need to act in accordance with the 'problem setting' of the design situation, while remaining flexible in response to its 'back-talk' and argues that the inquirer's 'ability to [maintain his double vision] depends on certain relatively constant elements that he may bring to a situation otherwise in flux: an overarching theory, an appreciative system, and a stance of reflection-in-action which can become, in some practitioners, an ethic for inquiry.' (1983/1991: 164) Here, digital spaces of interaction are intangible and shift, while the foundational architectural parameters of scale, distance and time present the 'relatively constant elements' that underlie all the aspects of the research, from the theory framing the approach, through the design practice, to knowledge-building by means of reflection. In individual design projects, the in-flux elements comprise phenomena of the digital, such as the encounter of information online, the relationship between content and viewer, and modes of sharing online.

In contrast, scale, distance and time present 'familiar categories' (Schön 1983/1991: 132) of both theory and practice and weave through all the design projects presented here. They provide a set of common elements to talk about and evaluate the various tangible spatialisations created in response to the conceptual challenges of the digital and their impact on individual notions of privacy. Reflections on notions of privacy and the orientation of the individual online – understood and articulated through the parameters of scale, distance and time – become a measure for the efficacy of architectural representation in addressing challenges of the digital.

Having outlined the methods of inquiry that enable the consideration of design projects as pieces of research, the next section will outline the architecturally-informed design methods that give rise to the range of design projects driving this research.

3.2.2 Design Methods

This section outlines the principles of spatialisation, before articulating the nuanced methods of miniaturisation, immersion, and mapping in relation to the foundational experiential parameters of scale, distance and time. While variously impacted by all three of the foundational architectural parameters, each of the methods presented here focuses on the introduction of a particular parameter: the method of miniaturisation introduces scale and uses the reduction thereof to focus on particular elements, clarifying the object of representation; the parameter of distance is introduced through the design method of immersion, which enables a dynamic and experiential set of distance relationships to emerge, that envelop and shift with the movement of the viewer; the method of mapping introduces the element of time, building on how maps are populated over time and continue to evolve, establishing relations between things that exist prior to being charted.

The methods presented here have been developed as a response to the challenges of the digital already discussed. The process of spatialisation is understood as the making-tangible of abstract concepts, such as the notion of privacy online, countering the challenge in engaging with the digital that interior and product designer Eve Stirling identifies: 'When studying something that can be transient and fluid, across the digital and the physical, the concept of a field site becomes fuzzy and less rigid.' (2017: 472)

The three foundational parameters are at play in varying ways in the three methods of spatialisation and impact each other, as shown in Table 3. The method of immersion, for example, establishes distance relationships between elements that are represented spatially at full scale, enveloping the viewer, who – based on their own movement – has a sequential experience of a space and the content represented through it. In contrast, the methods of of miniaturisation and mapping clarify relations between represented elements, mediated by a reduction in scale, creating distance between the object of representation and the viewing subject.

	SCALE	DISTANCE	TIME
MINIATURI-SATION	scaling-down as process of focusing attention on specific qualities of object of representation. viewing subject > object represented object > artifact	embodies relations btwn discrete elements; fixed distance between viewer and artifact, mediated by scale; object appreciated largely visually and entered mentally; some physical manipulation possible	miniaturisation fixes in-time, rendering the represented object observable (sometimes inviting manipulation); retrospective as spatialisation of existing conditions, projective as part of design process
IMMERSION	immerses on the scale of the viewing subject; spatial situation as representation of a range of conditions that can be moved through. viewing subject ≤ object	object entered physically; embodies relations btwn discrete elements that emerge and shift with changing viewpoint	relies on the presence of the moving subject, and simultaneous occupation by other people to test relations in space; retrospective as spatialisation of abstract phenomena; projective in design through full-scale prototypes
MAPPING	reduction in scale allows the positioning of elements/data in relation to each other, establishing new connections; relies on notation. viewer> object of representation represented object > map	establishes relations btwn discrete elements; fixed distance between viewer and artifact, mediated by scale of representational device	flattens time, bringing together recorded elements into one moment, where they might be recalled retrospectively & seen in relation to each other in spite of time; retrospective as spatialisation, recording what is known / seen / experienced
SUMMARY	scaling-down makes managable abstract concepts, allowing the viewing subject to see relations between discrete elements	1. embodiment of relations btwn discrete elements 2. enables clarification of relations between object (of research) and viewing subject	reduction in scale flattens time, depicting things in one moment, rather than communicating sequence; room-scale immersive spatialisations allow for unfolding of experience in relation to movement of subject

Table 3: Architecturally-informed design methods

Spatialisation transcends the media of architectural representation discussed earlier – drawing, diagrams and models, as well as the miniature doll's house – and focuses on the process of manipulating the foundational architectural parameters of scale, distance and time within the range of design situations presented here. Following McCullough's elaboration on the structuring capacity of scale and space that references Yi-Fu Tuan's bodily schema (1977), the methods of spatialisation re-establish connections between the subject and the object they are engaging with: 'Along with range, the body gives scale. Whether something is relatively larger or smaller than you are affects how you react to it. [-] Objects and spaces near our own scale are more comforting than abstract ideas and measurements at radically different scales.' (2005: 29)

Clarifying relations between diverse elements, spatialisations operate diagrammatically, and echo the shift of design practice towards the design of relations and design engaging with 'relationship systems', noted by designer,

engineer and architect Ezio Manzini (2015: 36). In a similar way that '[t]he diagram is often thought of as an after-the-fact thing, an explanatory device to communicate or clarify form, structure, or program' (Allen 2009: 50), the spatialisations in the first instance are 'after-the-fact-things', in the sense that they resituate and represent particular aspects of digital experiences in order to render them more tangible. Based on the methods of representation, the process of design in the wider process of research framed under the methodological umbrella of architectural representation, however, is generative and productive in giving rise to new situations in order to address them (Gaver 2012). In reframing the abstract challenges of the digital, the methods of spatialisation are considered as forms of architectural representation. The latter differentiates itself from other forms of representation, including even the presentation drawing in architecture (Evans 1989), through its projective nature: it typically is generative and produces something that does not exist before it, as has been discussed in detail in Chapter 2.

Focusing on the orientation of the individual within rapidly shifting contexts, a range of architectural design outputs – artifacts, interior spaces and physical-digital platforms – emerge as products, or 'witnesses', to this process of research using the architectural parameters of scale, distance and time.[97] The diagrammatic use of spatialisation allows existing abstract phenomena and situations to manifest materially through the design of physical objects and spaces, diagrammatically exploring the intangible relationships between people and content in digital settings by rendering them spatial.

Testing the design methods outlined in the following three chapter sections, the spatialisation of conditions of online experiences is intended to offer scope

97 The notion of the design object as a 'witness' to a research process has been explored in more depth in a conference paper, presented at the Design History Society conference on 'Design and Time', September 2016. Architectural theorist Peg Rawes points out in her discussion of the role of imagination and reflection in architectural design: 'The relationship between architectural design and the imagination is reconfigured so that its products become understood as material expressions of the process of reflective thinking in design.' (2007: 268)

for reflection on the orientation of the individual in digitally mediated environments. Emerging spatialisations are the manifestation of the manipulation of the three architectural parameters through design, offering varying distance relationships between researcher and object of representation. Further, the range of design outputs as a body of research become an orientation device for me as designer-researcher to explore new contexts of application for spatial ways of thinking and working. The three methods of spatialisation build on one another, and have been developed and tested iteratively in the sequence in which they are presented here, from the smaller to the larger-scale.

3.2.2.1 Miniaturisation

The method of miniaturisation focuses on communicating particular qualities of that which is represented by means of a reduction in scale. Its basic underlying principles have already been discussed in relation to drawing, diagrams and models, and the doll's house. As a tactic for managing complexity, focusing on key qualities of the object of representation, it relies on Gaston Bachelard's notion of the condensation of values in miniature (1958/1994: 150). Miniature spatialisations are largely representational in capturing and recording something that already exists and can be observed, as in the drawing *of* something, and might be viewed as a record that captures 'impressions received from a real object' (Evans 1989: 19). However, as a design method that gives form and scale to something inherently abstract and scale-less, miniaturisation also is generative and projective, closer to Evans' drawing *for* something. The method of miniaturisation in the context of this research is directed at giving form to the intangible and abstract qualities of digital experiences, rendering them observable by 'fixing' them in an object that establishes distance relationships amongst the elements shown diagrammatically.

Like the scale-representation of the doll's house, miniature spatialisations depict real objects, fix them in time and domesticate the object of representa-

tion. The miniature spatialisation as artifact establishes distance relationships between object and viewing subject – in this context again me as the researcher and reflective practitioner – and are accessed and navigated predominantly visually, again much like the doll's house.[98]

Setting a useful precedent for the design practice using miniaturisation presented here, Eve Stirling uses the architectural model as a means of representing data emerging from ethnographic research into social networking sites, and rendering it accessible for discussion; she argues that using analogue processes to interrogate the digital enables the challenging of aspects that might 'be taken for granted' if investigated merely digitally (2017: 473). Her method unlocks a new way for her to investigate particular aspects of Facebook, such as the 'wall', the 'newsfeed' and the chat function, and allows her to understand 'that Facebook is social and inhabited - a digital space as well as a place' (Stirling 2017: 476). However, building on the metaphorical language of the networking site – for example in modelling a wall that represents the Facebook 'wall' – this approach reinforces potentially limiting metaphors, discussed already in the review of the literature, and the spatial fixing of the individual Facebook user who the model aims to situate might not reflect the fluidity of interactions on the networking platform. Stirling's architectural models of digital practices in principle resonate with the use of miniaturisation to make observable intangible digital phenomena presented here; however, as part of the practice-led process of research, the miniature artifacts discussed here are of value as the starting point of this inquiry into modes of architectural representation across the range of scales, yet recognise the limitation of their use of spatial reference points, such as the construct of the theatre.

This design method is a means of capturing perceived impressions and observations – which in the context of this research do not have a distinctive

98 In their focus on the viewing relationship between representational object and viewing subject, the miniature spatialisations are somewhat independent of their wider spatial context. Araujo and Spankie (2011), for example, note that doll's houses are subject to being moved around the house, akin to pieces of furniture.

physical form – through the creation of a tangible, three-dimensional artifact. This, in turn, becomes instrumental in processes of reflection, as will be discussed in the Design Projects chapter (Chapter 4).

3.2.2.2 Immersion

Like miniaturisation, immersion also builds on the diagrammatic capacity of various forms of architectural representation to establish relationships between elements, manifesting as full-scale spaces that immerse the viewer within an analog environment. Crucially, the method of immersion frames the viewing subject as part of the spatial representation of relationships. Devised as a method for making tangible and experiential post-perspectival digital situations and streams of information online, the method of immersion reintroduces the capacity of perspective in helping to gauge relations between a range of elements from the point-of-view of the subject, who again is me as the designer and researcher. The shifting point-of-view that emerges from spatial immersion contributes to new understandings of the challenges made tangible. Unlike the static miniature that is apprehended at a distance, immersive spatialisations are inhabited and experienced sequentially, by moving through; they thus are in-flux, and depend on the positioning of the viewer and their perspectival viewpoint, as well as depending on the simultaneous occupation of the space by other people, echoing the experiential framing of interaction in the city, as explored in the review of the literature.

As a design method, immersion focuses in particular on distance relationships and aims to better understand spatially distanciated relationships, common in mediated communication, that are both geographically and temporally distant. Through scaling-up the spatialisation of observed dynamics online and physically containing the viewing subject within the representation thereof, immersion provides a new way of encountering and engaging with the object of representation that – quite literally – shifts the viewer's perspective on to it.

Immersion builds on the understanding that '[a]rchitecture is a concrete means of communicating the experience of space' that contrasts with drawing as an abstract means of communication, as discussed architectural historian Beatriz Colomina in relation to the work of architect Adolf Loos (1996).[99] Immersive spatialisations here manifest as room-scale, interior exhibition spaces and installations. As outcomes of design processes involving more conventional methods of architectural representation, such as diagrams and drawings, they in turn present forms of representation: as philosopher Karsten Harries argues, the finished artifact, or building, itself constitutes a form of representation (1998).[100]

The application of the method of immersion on the scale of the room brings about a 'resituation' of content: dynamics of interaction online, identified through the review of literature and focused on through the miniature objects as a means of problem-setting, are abstracted into a range of full-scale spatial situations, which bring to the inquiry the additional factor of context, and challenge relational conditions of distance, such as the positioning of viewer and content, the encounter of information, scales of interaction and degrees of enclosure and visibility.

The room-scale interventions present themselves as largely static situations, in which the viewing subject changes their own perspective on the situation by moving through the spaces of the gallery.[101] This immersive method of spatial-

99 It also extends the structuring capacity of space discussed by geographer Yi-Fu Tuan: 'Man, out of his intimate experience with his body and with other people, organizes space so that it conforms with and caters to his [...] social relations.' (1977: 34)

100 See also Colomina 1996.

101 While approaching design from a different disciplinary angle, the method of immersion resonates with the 'social navigation approach' (Höök, Benyon & Munro 2003), that aims to centre interface design on human interaction and human experience, with the 'idea of real and metaphorical immersion in recognizable and habitable space [-] at the core of this new line of thinking' (Paolucci 2003: 166). Instead of an explicitly socially-oriented stance, however, this research presents a position that might lean on the notion of 'spatial navigation' and uses architectural representation to better grasp the disembodied encounter of information online. However, it is not aimed at interface design, and instead develops a broader theoretical frame for architectural practice in relation to the digital.

isation reintroduces into the investigation of 'post-perspectival' and 'post-spatial' digital spaces the notion of perspective, enabling reflection on a range of spatialised conditions, in-situ: the specific, spatial, geographical and cultural context becomes a container for the investigation, resituating and framing the dynamics of online interaction within a spatial situation in order to make them tangible for the purpose of investigation.

3.2.2.3 Mapping

The last of the three methods of spatialisation, mapping is strongly linked to challenges of orientation and is introduced through projects on the scale of the neighbourhood. It depicts the object of representation at-scale, resituated away from the original it represents; as in miniaturisation, the reduction in scale creates a distance between the viewing subject and the object of representation. Ray Lucas points out in his overview of architectural methods: 'The spatialization of data is denoted by mapping.' (2016: 182) Mapping here is used in order to position in relation to each other and establish connections between audience contributions in live cultural contexts.

Similar to the other two methods of spatialisation, the key capacity of mapping of value in the context of this research is its ability to establish relations between discrete elements that are conceptually large, making their complexity manageable. In addition to the variables of scale and distance introduced through the miniature and the immersive space, mapping brings into the investigation the variable of time, responding to the recording capacity of digital technology that has disrupted understandings of interpersonal relationships and interaction. Rather than it being used as a design method to create a completed and static miniature artifact, for example, which fixes a series of spatial and temporal relationships, mapping allows the object of representation to evolve over time. In this, it brings the capacity of diagrams to communicate relationships between separate elements to the challenges regarding time

brought about by digitally-mediated interaction;[102] both have been discussed extensively in Chapter 2. Mapping is used here as a form of architectural representation to aggregate a range of individual contributions that, although made over time, are represented simultaneously, allowing for navigation of represented data in an atemporal manner[103]. In the 'StoryMap' project, the map is used to facilitate orientation in a network of sharing, allowing participants to position content in relation to that shared by other people and to recall this content by means of the map.

The method of mapping is perhaps the most 'representational' of the modes of spatialisation put forward here, with an emphasis on the prefix in the sense of repeating, or recalling, something that exists already. Mapping in the context of cartography might be understood as an attempt at creating a likeness (Baudrillard 1981/1994; Harries 1998), here it is used as a form of representation that is generative and enables the establishing of new relationships between data. As social scientist and geographer Doreen Massey points out: 'there are always connections *yet to be* made, [...] potential links which may never be established. [-] "Space", then, can never be that completed simultaneity in which all interconnections have been established, in which everywhere is already [-] linked to everywhere else.' (2005: 107) Its generative capacity lies in its ability to establish and make legible connections between discrete elements. Rather than presenting a completed representational object, the map offers a frame for the establishing of connections between elements over time. Framed as a collaborative method, mapping thus becomes a means of inviting participation, as will be explored further when discussing design projects on the scale

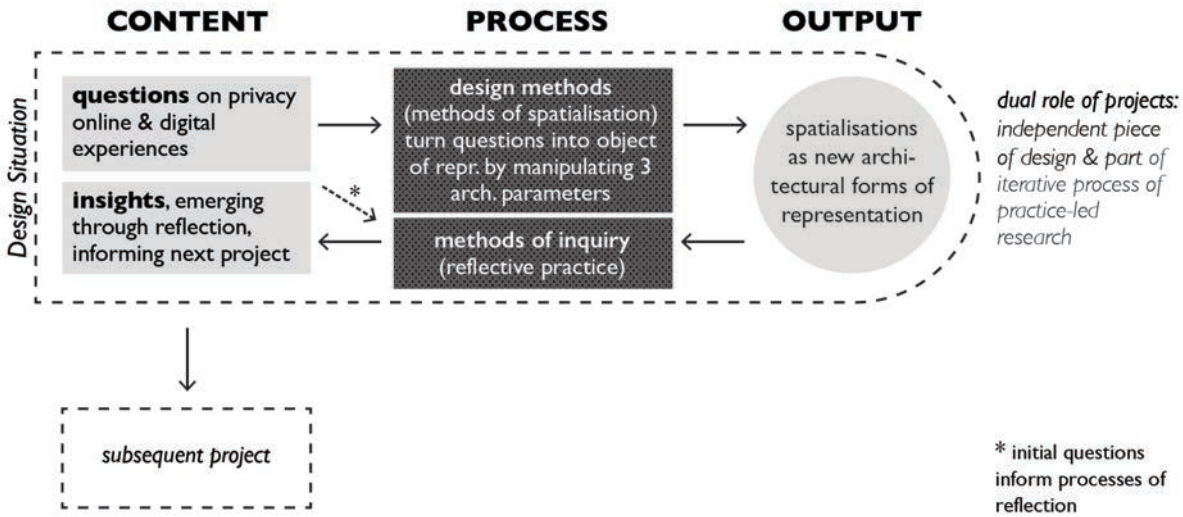
102 Allen argues that 'diagrams do not map and represent already existing objects or systems but anticipate new organizations and specify yet to be realized relationships' (2009: 51).

103 The atemporal nature of the map is underlined by an examples that aims to introduce sequence into the representational mode of the map: Doreen Massey describes the 'Codex Xolotl', an Aztec map dating back to the sixteenth century, that uses notation, such as footprints, to introduce sequence and narrative into the typically atemporal format of the map, istead integrating time and space: 'While presenting a kind of picture of the world "at one moment" (supposedly) [maps] also told the story of its origins.' (2005: 107)

of the neighbourhood.

This chapter has outlined design methods and the methods of evaluation deployed in this research (Fig. 6). In the following chapter, design processes and resulting outputs in the form of artifacts, environments and platforms for interaction will be discussed. The design methods of spatialisation will be tested in practice to encourage a rethinking of the digital. The spatialisations as design outcomes will then be reflected upon both with respect to design processes and spatialisations as design outcomes, emphasising the role of the foundational architectural parameters of scale, distance and time.

Fig. 6: Deployment of methods in design projects



4 DESIGN PROJECTS

This chapter will discuss in detail the projects that form the core of this research. It builds on the theoretical basis for inquiry built through the review of the literature, which has established the foundation for architectural representation in engaging with digital spaces, as well as the methodological frame of architectural representation, set out in the previous chapter. This frame brings together the design methods of spatialisation and methods of inquiry centred on Donald Schön's model of reflective practice.

The design projects range in scale from the miniature, through the room, to the scale of the neighbourhood. Each of the scales of projects engages the viewing subject differently: miniature artifacts focus on diagrammatically condensing select qualities into an object, apprehended largely visually; the room immerses the viewer in an experiential situation that is predominantly controlled through movement; and the neighbourhood-scale design projects provide platforms for the sharing of content by a broad range of contributors.

The design projects constitute key stepping stones in formulating the design framework that emerges as the overall contribution of this research and serve as exemplars for the deployment of the methods of spatialisation (Gaver 2012) – albeit used from the disciplinary point-of-view of an architect.[104]

Each project relates differently to the three foundational parameters of experience, manipulating these in varying ways to test the efficacy of architectural representation to engage with challenges of the digital (see Table 4, pp. 166/7).

104 Rendell further notes that research might 'generate new kinds of understanding, evidenced in those design *processes* themselves' (2004: 144; my emphasis).

4.1 PROJECT STRUCTURE: THREE SCALES

Developed under the umbrella of the CX, the projects expand on conventional architectural practice, and enable the testing of architectural representation within an interdisciplinary and interorganisational context.

The projects are driven by the three methods of spatialisation: the method of miniaturisation generates a range of miniature objects; the method of immersion results in two room-scale projects; and the method of mapping drives two projects on the scale of the neighbourhood. The projects increase in complexity as they move up the spectrum of scales. Framed as design situations, they bring together a growing range of 'materials of the situation', including materiality, site conditions, collaborators and contributors, with myself as the reflective practitioner at the centre of design and evaluation processes. Through activating the architectural parameters of scale, distance and time that are manipulated by the three methods of spatialisation, the design projects make tangible particular qualities of online experiences and of mediated interaction; these include the encounter of information, often described in reference to movement, shifting actor and audience relationships, as well as testing hybrid physical-digital means of sharing personal content.

The range of design situations on the scale of the miniature largely encompass a reflective conversation between me as the researcher and a range of questions that have emerged from the early review of the literature, for example concerning the shifting role between actor and audience in online social media and the physical impossibility of virtual spaces, made manifest in the artifacts. Through this process, each miniature object prompts a range of questions and contributes to the further shaping of the research trajectory and the main questions the research aims to address.

Creating an immersive and experiential situation within the public context of the art gallery, the projects on the scale of the room introduce into the

research the context of a specific physical site. The emergent settings frame relations between people and content through the distancing capacity of architectural space and rely on simultaneous occupation thereof by a range of people. The spaces present conventional architectural and interior design projects, and involve a range of stakeholders as part of the 'materials of the situation', such as client, collaborators, fabricators, as well as occupants, or users, of the space.

Projects operating on the scale of the neighbourhood bring together teams of experts in framing experience – researchers and practitioners from both, academia and the creative industries – to develop 'spatialised forms of social media'. As hybrid physical-digital interventions, the neighbourhood-scale projects bridge the gap between digital spaces as the subject matter of the overall inquiry and the analog realm as the core focus and site of design practice: mechanisms of sharing – familiar in online networking contexts – are rethought within a series of interactive situations that invite users to actively contribute by means of the developed platforms, testing degrees of individual control in public contexts of sharing through establishing relations between shared content. However, unlike the interventions on the scale of the room, the platforms on this scale do not rely on simultaneous occupation of physical spaces, and make shared contributions accessible in-spite of time; in this, they echo the asynchronous nature of online social media discussed in Chapter 2.

The projects were developed in the order they are presented here, growing from the small-scale miniature artifacts to the more complex projects on the scale of the neighbourhood, gradually building an understanding of the impact of the foundational architectural parameters on the way challenges of the digital are framed and acted upon. Figure 7 on the following page offers an overview of questions that inform each project, methods, individual outputs, and of how project insights inform the next project; this is explained in detail throughout the chapter.

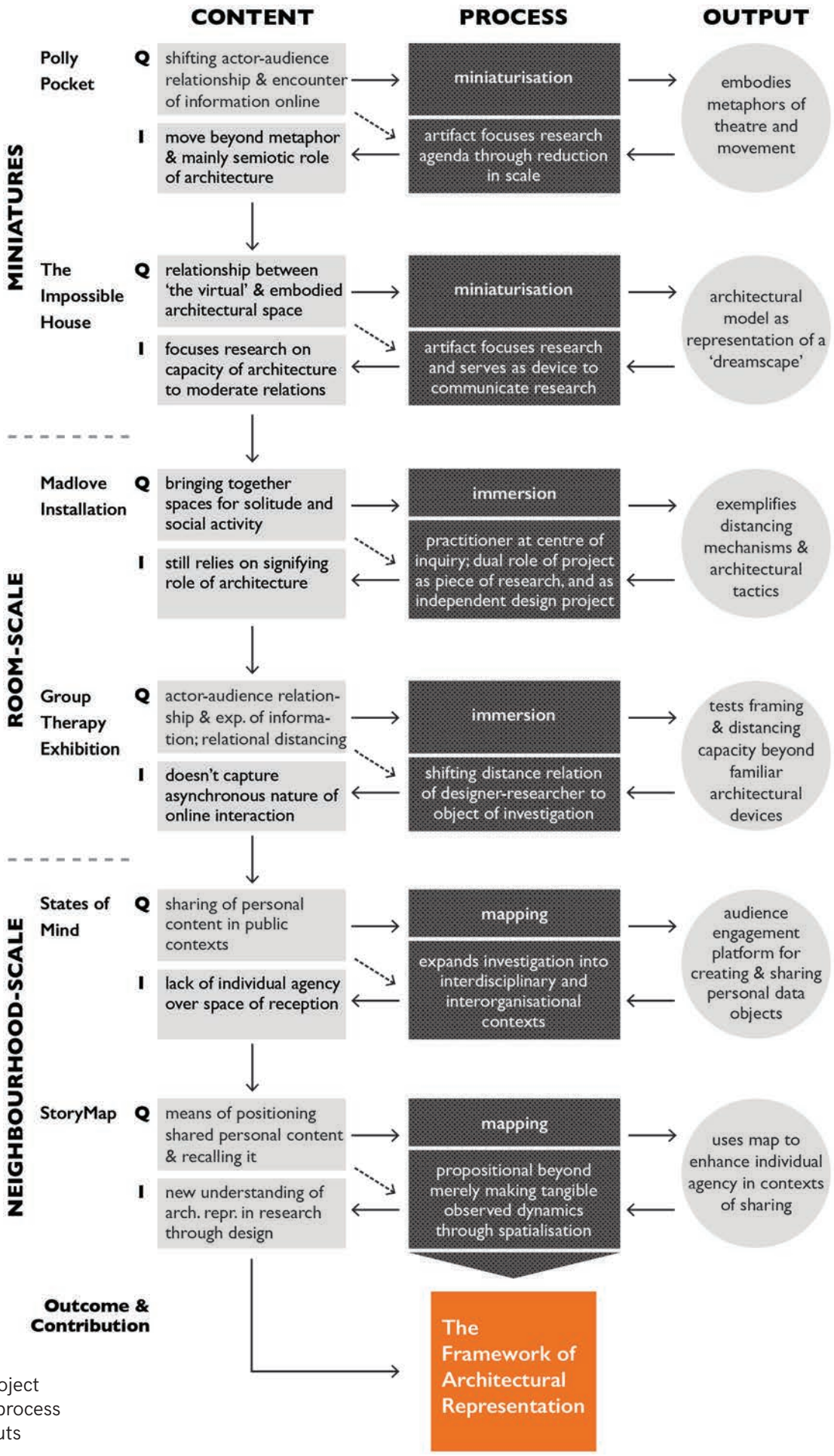


Fig. 7: Project content, process and outputs

4.2 MINIATURES

The first in the series of design situations operating across the range of scales are a group of miniature objects. The self-directed projects use the method of miniaturisation to condense key aspects of particular situations observed online into a group of objects smaller than the viewer. The reduction in scale facilitates an overview of the object of research: each object embodies in physical form particular aspects of digital experiences and mediated interaction that have emerged from the initial review of the literature, helping to clarify my own thinking through the 'back talk' of the range of design situations (Schön 1983/1991) and to frame the questions that will guide subsequent projects.

Appendix 4 discusses the 'Privacy Set(ting)s', an early miniature object that proposes physical means of interacting with privacy settings in online social networking platforms, manifesting in a 'stage set' with a range of architectural 'props' and 'actors' that can be positioned to negotiate degrees of visibility and access. It was instrumental in focusing the research on experiential qualities of architectural space in relation to the variables of scale, distance and time, instead of the semiotic role of clues, such as props, that returns to the potentially limiting use of architecture as a metaphorical point of reference in discussions of the digital, critiqued already in the Literature Review.

4.2.1 Polly Pocket

Two objects inspired by the children's toy 'Polly Pocket' abstract the dynamics of online experiences and interactions, embodying observations on shifting actor-audience relationships and the encounter of information online.[105]

4.2.1.1 Design Intent and Research Agenda

Fig. 8: 'Polly at the Theatre'

'Polly at the Theatre' (Fig. 8) presents an architectural setting that uses the typological metaphor of the theatre, aiming to embody the relationship between 'actor' and 'audience' in online social media in analog form and thus render it tangible. It builds on Goffman's theatrical sociology (1959/1971) and the notion of performing identity online, discussed already in the review of the literature (Chapter 2).[106] It tests the method of miniaturisation to condense varying relationships in mediated communication into a single object, that – like the doll's house – affords an overview and reflects on

105 The objects reference the 'Polly Pocket' toy, designed by Chris Wiggs inspired by compact make-up cases, and launched by toy manufacturer Bluebird Toys in 1989 (*100 greatest toys* 2010). The original 'Polly Pocket' of that time is a toy with a roughly hand-sized shell, that opens to reveal a typically domestic setting in plan-view in the lower half, and a sectional view thereof in the upper half. Plan and section are extruded and circular footprints in the plastic surface of the base allow a small plastic figure of just under 25mm height to be positioned in a range of places within the shell; the figure bends in the hip, enabling her to be seated.

106 A few early positioning papers presented at conferences and published subsequently explored the architectural construct of the theatre as a way of understanding the swiftly shifting relationships between actor and audience, as well as highlighting the difficulties of adequately gauging audiences in mediated interaction (Koslowski 2014; 2016). These early explorations were built on the capacity of the stage in theatre to bring together a range of divergent worlds and settings that may appear mutually exclusive (Foucault 1967/1984), reflecting the convergence of multiple contexts of interaction in mediated communication (Applin et al. 2012).

visibility and notions of privacy.

'Polly's Navigational Device' (Fig. 9) steps away from a focus on online social media and considers the encounter of information online[107] more broadly. It aims to challenge the spatial language of movement applied to online experiences and the accessing of content, as discussed earlier (Maglio & Matlock 2003; Matlock et al. 2014).

Fig. 9: 'Polly's Navigational Device'

4.2.1.2 Project Description

In plan-view, 'Polly at the Theatre' contains a bar and auditorium, while the sectional half of the object shows a stage with theatre boxes and backstage area above, suggesting the theatre as a model containing spaces for one-on-one interaction, taking place in a notional bar, performance to an audience on a stage, and retreating into the privacy of the backstage area to avoid interaction with others.[108] The object has the small circular indents, into which the 'Polly' figurine can be placed, typical of the original toy.

'Polly's Navigational Device' uses an original 'Polly Pocket' heart-shaped shell, with inserted layers of acrylic, offering two surfaces to position figures on: the upper half of the shell contains three footprints on a map etched into the acrylic surface. The map suggests that the small figure is moved *to* particu-

107 'Information online' here encompasses that, which might be provided through sharing of content by connections in online social networking platforms, represented by 'Polly Pocket' figurines. Taking into account interaction through online social media, this content encompasses information within web browsers, as well as content provided through sharing in digitally mediated interaction with others; it is represented through small figurines, positioned in relation to one another.

108 Following close study of a range of original Polly Pocket toys, the settings for this object were sketched out by hand, modelled using 3D modelling software Rhinoceros, and then rapid-protoyped using a white powder-based compound.

lar locations, in the way that someone might 'go to' a website using an online browser. The lower half contains a central footprint to position a miniature figure; a range of disks set into the surface around this central stand-point spin when turning a small wheel at the front of the device. The figures positioned within footprints in the rotating disks move closer and further away again from the static figurine at the centre. Contrasting with the map, the lower half with wheels and cogs suggests that the viewing subject – here the central static figure – has content delivered *towards* them.

4.2.1.3 Insights and Limitations

The positioning of the figurine in 'Polly at the Theatre' allows varying distance relationships to be established; the object further introduces the spatial constraint of sight-lines into the consideration of relationships in mediated interaction, which will be picked up in the design for the 'Group Therapy' exhibition on the scale of the room. The figure of 'Polly' stands in for the user of online social media, who shifts position rapidly from being the viewer of content – or 'audience member' – to being its producer – or 'actor' – reflecting on notions of prosumerism already discussed in the review of literature. The metaphorical architectural construct of the theatre – frequently used metaphorical shorthand for interaction online (Baudrillard 1988; McCullough 2005; Keen 2012) – is used as a catalyst for thinking about how the digital operates. However, as the object helps to explore, the theatre is no longer able to adequately reflect the multitude of digital spaces users inhabit in online social media; rigid metaphors like it fail to capture the shifts in social spaces online at the heart of the challenges this research aims to engage with: the figure can only occupy one position at any one time and simultaneous interactions in a range social contexts online are fixed within the metaphorical model of the theatre; reciprocity and rapidly shifting roles are not captured effectively, failing to reflect the notion of inhabiting multiple positions simultaneously in contem-

porary 'poly-social reality' (Applin et al. 2012). The theatre metaphor further relies on a semiotic reading of the object, focusing on spatial signs instead of building on the distancing capacity of architecture, mediated by the parameters of scale, distance and time, that is of interest in this research. While metaphors or 'social proxies can [-] make interactive expectations visible' (Erickson & Kellogg 2003: 27),[109] they might not capture nuances of interaction, in particular in non-verbal communication (Paolucci 2003: 167).[110] As metaphors, the 'Polly Pocket' objects similarly risk over-simplifying. However, as part of the process of 'problem setting' in the context of this research, they help to frame the objectives of inquiry: the artifacts are useful in identifying particular dynamics of online interaction and of digital, or virtual, experiences that this research concerns itself with, helping the further testing of architectural strategies to act upon these in projects on the larger scale.

While experiences of the digital are often conceptualised in analog terms that suggest the movement of users through seemingly static information settings, 'Polly's Navigational Device' suggests that, instead of actively moving, the viewing subject has content delivered to them. It offers an alternative consideration of digital experiences of information, away from a merely metaphorical use of space, instead considering distance relations between a mobile viewer and content. This is explored further by means of immersion on the scale of the room.

109 The authors study the representation and understanding of interactions within the social situation of a lecture.

110 Peter Paolucci notes with regards to Erickson and Kellogg's study: 'As compelling as this model is [-] the fact remains that the proxy is still disturbingly naïve about what constitutes social interactivity.' (Paolucci 2003: 167)

4.2.2 The Impossible House

A further miniature artifact, 'The Impossible House', builds on the critique of metaphors to connote the digital and highlights differences between the physical coherence of spatial and 'virtual' settings, making tangible the spatial impossibility of virtual spaces.[111] The architectural model represents a 'dreamscape', the range of settings experienced in a dream (Figs. 10 & 11).

Figs. 10 & 11: 'The Impossible House', side and top view

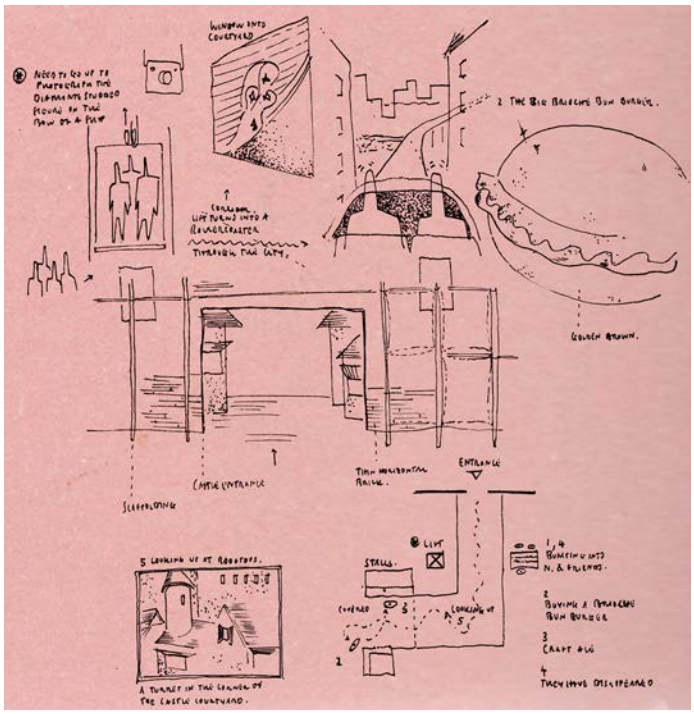
4.2.2.1 Design Intent and Research Agenda

Sketches that have been made to capture the dream only manage to communicate it in a series of moments, akin to a storyboard (Fig. 12). The architectural model, in contrast, aims to bring together the range spatial settings into a single object and captures the journey taken, clarifying spatial relationships between individual moments. Through this, it aims to offer a means of reflection on the notion of 'the virtual' (Foucault 1967/1984) and its relationship to embodied architectural space.

111 The object was initially presented as 'The House of Lies' at the Research Biennial exhibition and conference under the banner 'Why Would I Lie', at the Royal College of Art in April 2015. The object and its spatial implications are presented in greater detail in a brief article; see Koslowski 2015a.

4.2.2.2 Project Description

The imagined – or dreamt – virtual moments are recorded through drawing, before the spaces that framed the narrative of the dream are modelled digitally using digital modelling software Rhinoceros (Fig. 13). The digital model is unfolded and used as a template to manually make the moments from textured watercolour paper. The individual 'scenes' of the dream are assembled and formed into a single designed object using a frame made of died cast plaster and threaded rod. This frame takes the shape of a house with steep pitched roof, referencing my childhood home as a frequent setting of dreams.



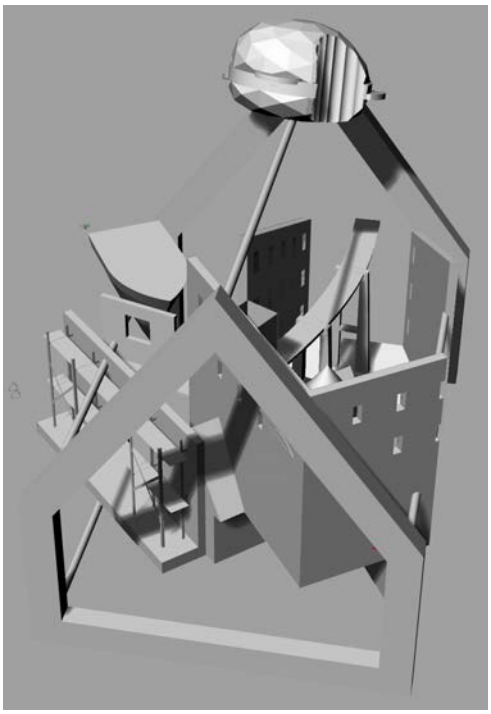


Fig.12: Drawing capturing moments of a dream

Fig. 13: Digital model bringing individual moments into a single object

4.2.2.3 Insights and Limitations

'The Impossible House' comments on the freedom of virtual spaces from pragmatic physical constraints: the mental map one might have of the dreamscape does not need to physically cohere in order to be useful to contain narratives and to articulate relationships between individual perspectival moments. The making of an architectural model to capture the range of dreamt moments exposes the physical impossibility of imagined, non-physical spaces – akin to

mise-en-scène in film[112] – as spaces turn in on themselves and intersect one-another in a way that disrupts the viewing of individual scenes in the object. Revealing the series of moments, or sets, of the dreamscape simultaneously, the miniature artifact contrasts with the sequential unfolding of narrative in dreams; it thus flattens the dream into an object that presents itself at once, much like the doll's house, merely viewed in sequence.

In making physical the virtual landscape of the dream, the model helps to foment miniaturisation as a method for understanding relations between intangible elements. Its condensation of values encourages a focus on spatial form and adjacencies, instead of other qualities, such as materiality and atmosphere. The architectural model operates largely diagrammatically and focuses on the organisation of, and relationships between, its parts.

112 The notion of mise-en-scène in film in relation to conceptions of online interaction has been explored in greater depth in the book chapter 'The Mediating City' in *Filming the City*, based on a conference presentation at the 'Mediated City' conference in 2014; see Koslowski (2016).

4.2.3 Outcomes

The outcomes of the design projects on the scale of the miniature are two-fold: concerning the content of the research, they shift focus towards the capacity of architecture to moderate relations, rather than investigating the semiotics of architecture; regarding the practice-led research process centred on architectural representation, the miniatures offer means for the researcher to engage with the abstract object of investigation through condensing and focusing.

The miniature objects capture a range of observations about the digital and represent them retrospectively. However, considering them as a series of 'move experiments' in research through design, the small-scale projects help to shape the further research trajectory; in this, they operate projectively, as is typical of architectural representation in design processes.

Through the design method of miniaturisation, the miniature artifacts diagrammatically describe distance relationships between embodied elements. Further, miniaturisation creates distance between the object of representation and the viewing subject. Similar to Susan Stewart's doll's house discussed already, the object of representation is tamed at a scale smaller than the viewer. At the same time, the process of miniaturisation reduces the complexity of the represented online dynamics and renders them tangible for the purpose of interrogation. The focus on particular qualities of the object of representation helps me, as the researcher, to tame and engage with the complex challenges presented by digitally mediated communication and notions of privacy in a digital age.

Furthermore, the miniature artifacts as designed outcomes have served as means of communicating the research in-progress to other people, from supervisors, to fellow doctoral researchers at the RCA and within the network of the

CX,[113] also noted by Eve Stirling (2017).[114]

While miniaturisation creates a degree of distance between viewer and object in the way the object is viewed, it is useful in contexts of research, helping to tame the complexity of conceptually larger challenges, it simultaneously presents a way of bringing the researcher closer to the object of research. The shifting relationship between the designer-researcher and the object of research is tested on the scale of the body in the projects on the next scale of the room.

113 As a physical expression of and response to some of the questions the research deals with, the objects and spaces might be framed as witnesses to the research process, documenting the research process at the same time as making tangible and experiential some of the observed dynamics, complexities and interactions digital spaces facilitate. This notion of the object as 'witness' to the process has been explored in more detail in a paper presented at the Design History Society Conference on 'Design and Time', in September 2016.

114 To quote: 'The process of making the model influenced the study findings in a number of ways – making the model, presenting it at the conference and sharing the process with others, helped me understand the importance of the model making as an analytical tool.' (2017: 475)

4.3 ROOM-SCALE INTERVENTIONS

Through the method of immersion, the two projects on the scale of the room aim to test scales of interaction and degrees of visibility online, which have emerged in the review of the literature as rapidly shifting and being unpredictable in digital spaces, in architectural terms. The interrogation of the digital through architectural means is scaled-up to the scale of the body and the design method of immersion gives rise to a series of settings that build on the fixed miniature object. The projects discussed here form part of the exhibition 'Group Therapy: Mental Distress in a Digital Age,' held at the Foundation for Art and Creative Technology (FACT) in Liverpool between March and May 2015: the first is the design for an art installation within the exhibition, the second is the spatial design for the exhibition itself. As pieces of research through design, both projects test the spatial moderation of relationships between people and challenge the encounter of information online.

The ephemeral nature of exhibitions enables experimental approaches to spatial design[115] and the relatively rapid process of designing and realising exhibitions enables 'Group Therapy' as a platform for research. The interventions on the scale of the room presented here in the first instance exemplify the mediating role of architectural space, discussed already in relation to architectural theory, offering varying degrees of seclusion and sociality in the 'Madlove' installation. The wider space of the gallery is used as a site to test the distancing capacity of architectural space in relation to the actor-audience dialectic that has been disrupted online.

Suzie Attiwill, an interior designer and researcher who has worked extensively with exhibitions as platforms for research, notes that 'exhibitions are interior designs where the relation(s) between people and their environment

115 'The ephemeral nature of exhibitions enables their realisation as actual spaces where research as experiment can occur at 1:1, materially and temporally.' (Attiwill 2008: 45)

is the focus of design' (2008: 45), rendering this spatial format a useful vehicle for research aimed at better understanding interaction and the mediating role of architecture. As well as positioning elements, including artworks and the viewer, in relation to one another, the immersive settings on the scale of the room test the framing capacity of immersive architectural space: the researcher as viewing subject is situated within a spatial representational situation, allowing the observed conditions of the digital that are represented in the space to be sensed and explored beyond the domain of the visual.

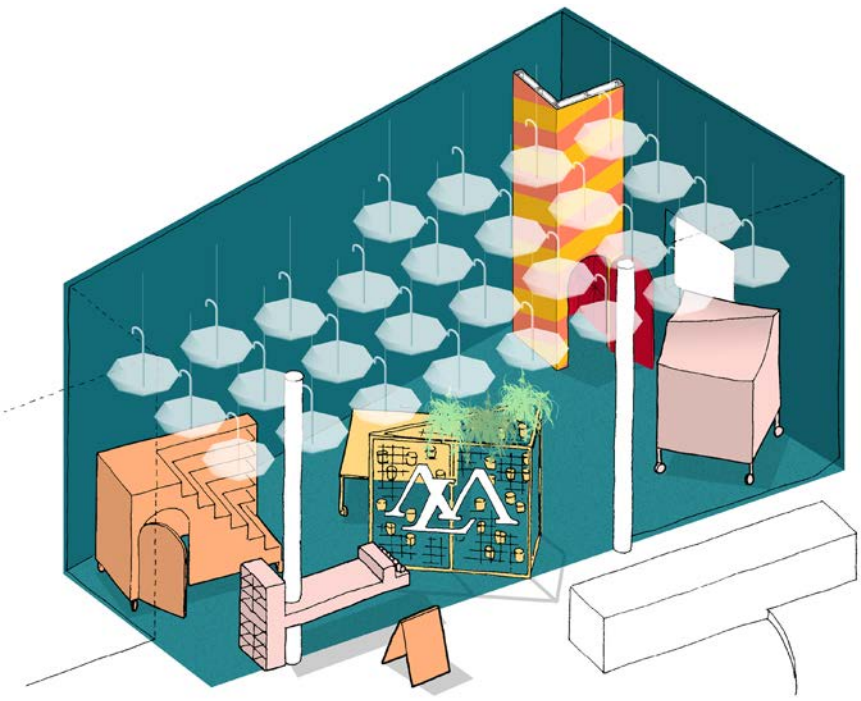


Fig. 14: Isometric drawing of 'Madlove' installation

4.3.1 'Madlove: A designer asylum'

'Madlove: A designer asylum' is an immersive art installation, inspired by a broad range of ideas about mental wellbeing and the spaces that facilitate it (Figs. 14 & 15). It facilitates a range of social situations, ranging from solitude to social interaction. In the context of this research, it exemplifies some of the distancing mechanisms and architectural tactics discussed in the review of the literature (Chapter 2). As well as being the first artwork encountered in the 'Group Therapy' exhibition, as a design project in the context of this research, it operates as an initial test for the method of immersion, which will be developed further in the next project on the scale of the room to embody and respond to challenges of the digital more explicitly (Section 4.3.2).

Fig. 15: View of 'Madlove' space

4.3.1.1 Design Intent and Research Agenda

Conceived as a 'safe place to go mad', the art installation spatially brings together and makes tangible qualities of good mental health elicited through a range of workshops, previously conducted by project collaborators. The installation aims to support individual and collective mental well-being, providing space for different activities, from retreat to conversation and social activity, with a programme of events at the heart of the installation. A central design ambition was to create a playful environment that would encourage gallery visitors to inhabit the space in a way that suited their needs: the structures, each with their own distinct qualities, are suggestive of use, yet remain to be interpreted and appropriated by users. A group of brightly coloured structures are intended to be suggestive of use through their design and the spatial qualities they described, instead

of prescribing a specific use.[116] Naming the structures at the outset helped to ascribe each one particular qualities, while giving the range of structures a visual and spatial coherence (Fig. 16).

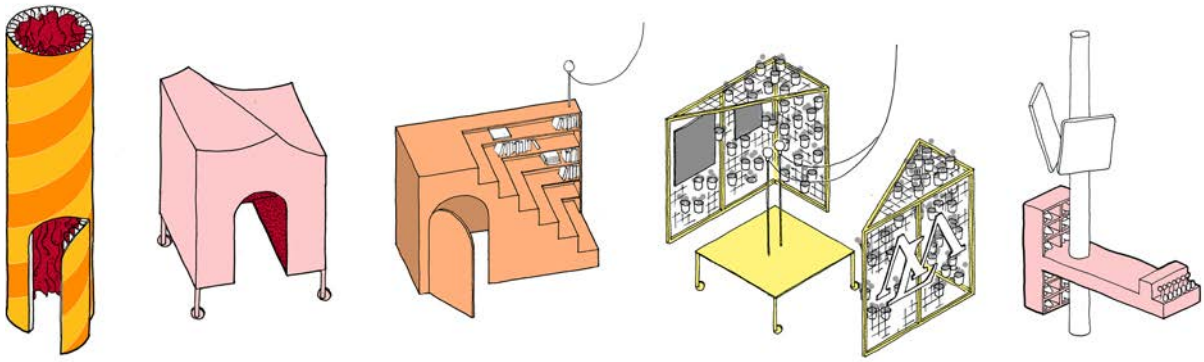


Fig. 16: Cooling Tower, Turkish Delight, Bookcase Stair to Nowhere, Madlove Oasis and Shoes & Smells

4.3.1.2 Collaborators

The art project was conceived by artist James Leadbitter, working under the pseudonym 'the vacuumcleaner', and producer Hannah Hull, who conducted a range of workshops considering the sensorial qualities of good mental healthcare, as well as exploring what kind of environments support mental wellbeing.[117] The installation as a beta-version of the project is the outcome of my collaborative design process with architect James Christian of design studio ProjectsOffice. Documentation of the workshops served as a visual brief to inform conversations between artist, producer and designers.[118]

116 The capacity of space to be suggestive of use without being prescriptive, instead accommodating individual need, has been explored in a research project with a large Scottish hospital. A design strategy developed by the project team at the Helen Hamlyn Centre for Design was developed to address issues of space use, taking into account individual user perspectives (Koslowski & West 2014).

117 The workshops involved a broad spectrum of people, including service users and healthcare professionals. Leadbitter and Hull worked with local illustrators to capture workshops with participants. The installation for 'Group Therapy' is seen as instrumental in increasing awareness of the project and to stimulate debate in order to affect the landscape of mental healthcare.

118 For media and press coverage of the project see Gill (2015), Hohenadel (2015a; 2015b) and Sinclair (2016).

4.3.1.3 Project Description

In the designing the art installation, James Christian and I imagined the space as a 'chocolate box of delights', with unique 'flavours' presented in a unifying enclosure. This was translated into the teal-coloured walls and carpeted floor as a backdrop, against which the brightly coloured structures are placed, offering a range of opportunities for social interaction and individual seclusion. The space presents a physical manifestation of some of the qualities of separation and control discussed in the Literature Review (Chapter 2). The design of the 'Madlove' space is discussed in greater detail in Appendix 5.

4.3.1.4 Insights and Limitations

The varying degrees of sociality and enclosure offered in the 'Madlove' installation constitute an explicit spatial manifestation of the role of architecture in affording its users privacy, discussed already in the review of the literature. The conditions of privacy might be viewed as an exemplar of the affordances of architectural space for the private, as well as the social individual, illustrating the ways in which space and architectural tactics can moderate degrees of access.

The project introduces into the research the method of immersion. However, the 'types' of enclosures in the 'Madlove' installation continue to rely on architectural signifiers, such as doors, walls and windows, that are already used as a shorthand to talk about shifting notions of privacy in the miniature objects. Further, the structures with their distinctive forms operate symbolically. The next project aims to move beyond 'architecture as image' (Venturi, Scott Brown & Izenour 1977), and focuses on the capacity of architecture to manage proximity.

4.3.2 'Group Therapy'

The spatial design for the 'Group Therapy' exhibition uses the method of immersion to create an environment that offers scope to rethink rapidly shifting roles of consuming and producing – or sharing content – in online interaction (Fig. 17).

Fig. 17: Isometric drawing of the main gallery space at FACT Liverpool

The curatorial content challenges the relationship between technology and mental health: it investigates the impact of increasing connectedness to others and persistent drives to consume on individual well-being. Technology is considered not just as increasing levels of anxiety and is also presented as a potential tool to alleviate symptoms of distress.[119] The exhibited content ranges from artifacts, to interactive installations, video projections, immersive experiences, and digital applications.

119 See publication accompanying the exhibition, edited by curator Vanessa Bartlett (2015).

4.3.2.1 Design Intent and Research Agenda

The design for the 'Group Therapy' exhibition enables me as an architectural designer to utilise the framing role of architectural space to rethink the encounter of information online and rapidly shifting actor-audience relationships; this builds on the well understood moderation of degrees of access and sociality between people through architectural space, as illustrated in the 'Madlove' installation, as well as on observations made manifest in the miniatures: the limitations of architectural metaphors to describe digital experiences; active movement to navigate content, already commented on through 'Polly's Navigation Device'; and the relationship between viewer and content, or actor and audience, embodied in 'Polly at the Theatre'. The exhibition aims to test the latter through the diagrammatic distancing that architecture can facilitate, in order to move beyond a reliance on signifiers and metaphor.

Varying actor-audience relationships online are a conceptual driver for the exhibition design tested in relation to shifting relations between visitor and curated content[120] and the gallery visitor is positioned as an integral part of the exhibition. The exhibition aims for a more subtle manipulation of relations in space than the design for 'Madlove', with its clearly delineated spaces and familiar architectural signifying devices. The challenge of understanding one's individual point-of-view within information-heavy digital environments at the heart of this research relates strongly to the density of curatorial content in 'Group Therapy', both in terms quantity of information – or the amount of artworks – and the nature of the content – here the challenging subject matter of mental health in a digital age that the artworks problematise. This

120 The space of the art gallery offers a useful context to consider analogous models of experiences of the digital; much of the content experienced on the social web, for example, is in some sense curated – whether through traditional media outlets, the sharing behaviour of 'friends' and those whose media streams one 'follows', or through the targeting of content through social networking platforms that prioritise and pre-select what content one should see (Mims 2017). The curated content of the exhibition serves as a substitute for the content that might be encountered online and becomes part of the 'materials of the situation', determined by the curators.

correlation has offered the exhibition up as a site in the context of this inquiry, which in turn has helped to inform a conceptual approach to the design of the exhibition. The exhibition design reflects the curatorial ambition of generating degrees of introspection in the visitor, which becomes a conceptual driver for the spatial design: aiming to encourage a rethinking of the experience of information online, in particular in relation to the actor-audience dialectic that has been disrupted through digital communication technology, the designed space frames the visitor in ways that suggest they are part of the curatorial content of the exhibition.

As an experiential analogue of digital spaces, the exhibition tests the method of immersion as a means of better understanding and reconceptualising the encounter of information online. Further, the project introduces members of the public moving through the space as part of the materials of the situation.

4.3.2.2 Collaborators

'Group Therapy' is jointly curated by curator and researcher Vanessa Bartlett and Director of FACT Liverpool, Mike Stubbs. As a designer, I worked alongside the wider curatorial team at FACT and with their in-house production team.

4.3.2.3 Project Description

The exhibition design presents varying spatial situations that utilise the framing role of architectural space in shaping the experience of curatorial content, which is read as a proxy for digital content online. A series of frame structures establish a range of spatial conditions, varying scales of enclosure, shifting distance relationships and the different ways of framing artworks and gallery visitors (Fig. 18). The frame structures are designed to hold a range of curatorial content and create shifting degrees of permeability and overlap, frame views, act as screens or form self-contained rooms (Figs. 19 & 20).

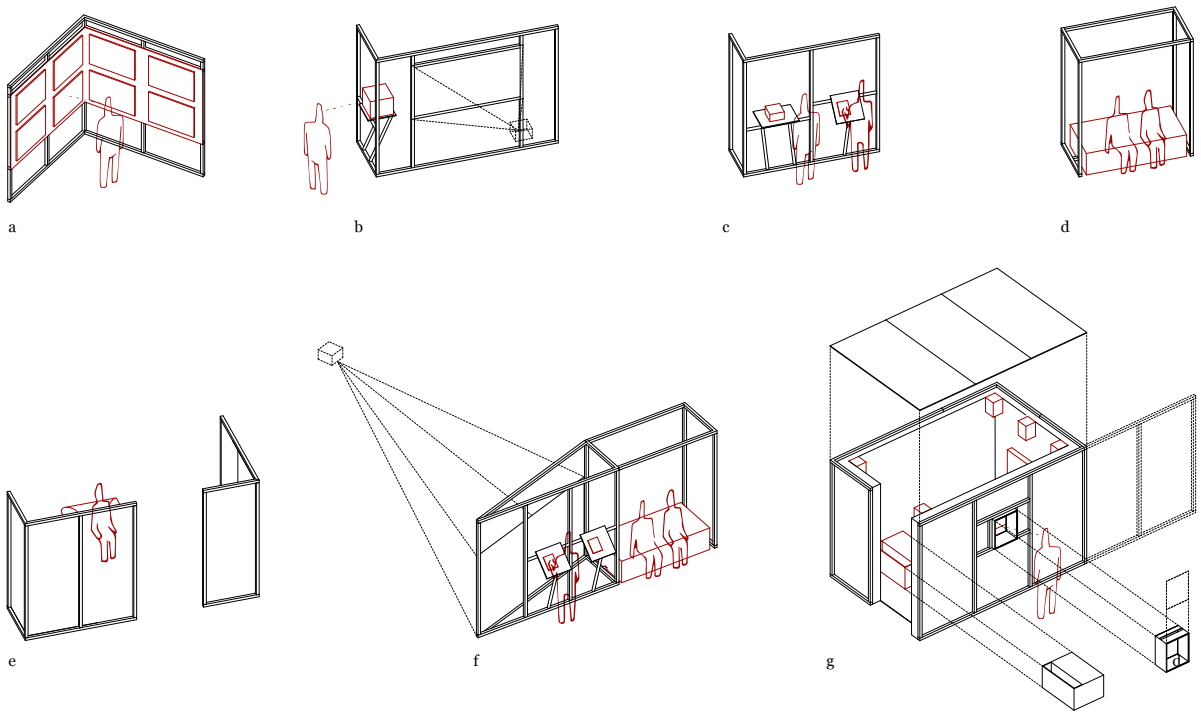


Fig. 18:
'Types' of frame structures

The range of types of painted timber frames quite literally 'frame' the relationship between artwork and viewer, presenting the viewer as part of the exhibition: a visitor sitting down to watch a moving-image artwork, for example, is framed by the structure as on a plinth (Fig. 21), while another who is immersed within an artwork presented as a set, appears to be part of it (Fig. 22). The ways in which the designed space frames both content and the gallery visitor as part of this exhibition are discussed in more detail in Appendix 6.

Figs.19-22:
Varying spatial conditions shift relations between viewer and content

4.3.2.4 Insights and Limitations

As emerges from the design for 'Group Therapy', immersion allows for varying readings of the representational space as a spatialisation of digital situations. A fluid consideration of architectural framing in relation to the digital, away from familiar architectural devices as signifiers, had not offered itself up through the review of the literature in the field, and instead has emerged from my immersion as the reflective viewer, moving through the spatial situation and changing my perspectival relationship to it. Through the method of immersion, the overview of the object of representation in the miniature gives way to a perspectival view from *within* the representational object, in this case the gallery space. With regards to its capacity to manage distance relationships, the exhibition space might be described as an immersive, or inhabited diagram, in which the description of distance relationships shifts depending on the positioning of the viewer. The project led to a 'vocabulary' of spatial constraints, such as scales of enclosure, permeability, transparency and overlap – and viewing conditions – such as sightlines, peripheral awareness, distraction and attention. While architectural space keeps people and objects at a distance from each other, these spatial constraints nuance degrees of separation as described by doors and walls, and is considered useful in discussions of the orientation of the individual online. However, as the overall inquiry is focused on underlying processes of architectural representation, this 'spatial vocabulary' is not tested further here.

The project builds on and expands Schön's notion of the design situation. Upon realisation of the exhibition space, the design process as the initial design situation gives way to a process of reflection through the 'designed situation': the exhibition space itself moves on from simply being the final object in the epistemic process of designing and in turn becomes a vehicle for research. The exhibition space as the representation of a series of abstract dynamics observed in digital information spaces presents a new spatial 'situation', that involves gallery visitors, including the researcher, and curated content as the materials of

the situation that operates as a lens onto the digital.[121] Immersed in the space as gallery visitor and researcher, I am able to consider the framing of other visitors-as-content through this spatial situation and reflect on the challenges of the digital embodied by the space in a way that the design process had not enabled. The gallery space becomes a device for processes of 'thinking through design', building on Henk Borgdorff's work (2011).

121 John A. McArthur notes: 'The experience of the user is as much a part of the design as the content and [-] the user must play a justified role in contemporary conceptualizations of information design.' (2016: 168) His statement is considered relevant also to this work at the intersection of architecture and communication design.

4.3.3 Outcomes

Testing how the method of immersion can encourage a reconsideration of aspects of digital experiences, the room-scale projects occupy a pivotal role in this investigation by pushing the boundaries of architectural representation: the spatial immersion of the researcher within the representational situation is used to rethink the digital as the object of representation, offering a range of shifting perspectives on to it. This focuses the research on architectural design practice with the designer-researcher at the centre and enables the exploration of processes through which architecture can engage with the abstract challenges of the digital.

While the room-scale interventions, and the exhibition design for 'Group Therapy' in particular, offer the reflective practitioner a range of perspectives onto the object of representation, the method of immersion presents a key limitation in the context of this investigation: it relies on the simultaneous, in-the-moment inhabitation of the full-scale spatialisation and the designer-researcher as viewing subject needs to be in the space alongside other gallery visitors that constitute a part of the design situation. As such, the room-scale immersive spatialisations do not capture the asynchronous nature of digitally mediated interaction that has been identified through the Literature Review.

The projects on the scale of the neighbourhood will introduce the method of mapping as a means of responding to the recording capacity of digital communication technology that has been instrumental in shifting inherited notions of privacy online, as discussed already.

4.4 NEIGHBOURHOOD-SCALE PLATFORMS

Two projects on the scale of the neighbourhood test spatialisation to render tangible and to challenge means of sharing personal content online, aiming to reflect and respond to the asynchronous nature of digitally mediated communication. Two hybrid physical-digital mechanisms build on the interventions on the scale of the room by overcoming the need for simultaneous inhabitation. Working in collaboration with a range of experts, the projects expand the investigation of architectural representation into interdisciplinary and interorganisational collaborative contexts.

While the room-scale interventions into the gallery present a thinking-through of the encounter of information online in an immersive physical and curated setting, manifesting in an analogue spatialisation of aspects of digital experiences, these hybrid physical-digital interactive platforms are considered as analog forms of online social media platforms. They suggest an embodied, situated and contextual approach to sharing and recalling content, and continue to involve public audiences as a part of the materials of the situation. The specific cultural contexts counter the abstract and placeless realm of the digital and provide a backdrop against which to think-through challenges of the digital by means of design.

The neighbourhood-scale projects use the method of mapping as a means of establishing and exploring relations between shared content, responding to the recording capacity of online social networking platforms and the retrospective accessibility of content, which has been shown to disrupt expectations of interaction, as discussed in the review of the literature (Chapter 2). The two projects develop 'spatialised forms of social media' that invite audience members in live cultural contexts to contribute a personal data object or anecdote, which is re-positioned within the public and curated contexts of exhibition and theatre performance, allowing contributions to be seen in relation to each other and for new connections to emerge.

Both projects are developed through the infrastructure of the CX and are sited within contexts of cultural production: FACT Liverpool provides the platform for the 'States of Mind' project, while a theatre festival – the 'Shakespeare in Shoreditch Festival' 2016 in East London – accommodates the 'StoryMap' project. These contexts bring with them the need for the creative engagement of audiences as identified by the cultural producers as project partners, and gave rise to the notion of 'audience feedback', which provided rationale and impetus for the development of project briefs. These were developed alongside convening project teams and establish a firm connection with the overall research agenda; this allows the collaborative and interdisciplinary working processes to give rise to projects that actively engage audiences and encourage participation and that expand my own architectural design practice.

The architectural variables of scale, distance and time have varying impact on the two projects presented here. Dealing with conceptually large networks of sharing, the neighbourhood-scale tests the scale representation of the map as a means of bringing together a large number of contributions. The increase in scale concerns also the complexity of the projects as design situations, and they involve a greater range of 'materials' than preceding projects: through the live cultural contexts, members of the public are invited to contribute by sharing personal objects and anecdotes. In addition to the two platforms as design outputs, the projects explore collaborative relationships with experts in framing individual experience.

Crucially, through the projects on this largest scale, the architectural variable of time is introduced as a key element into the practice underpinning this research, responding to the recording capacity of technology and the shifts in contexts of reception brought about by it, as discussed in the review of the literature (Chapter 2), and as emerged as a limitation in the projects on the scale of the room (4.2).

4.4.1 States of Mind

The collaborative 'States-of-Mind' project is a hybrid physical-digital platform that encourages audience participation within the context of the gallery, developed as one of the exhibits of the 'Group Therapy' exhibition at FACT Liverpool and taps into notions of sharing at the heart of misunderstandings of individual privacy online. The platform (Fig. 23) elicits, collates, contextualises and presents personal contributions, bringing these into 'conversation' with one another, and allowing gallery visitors to see their own 'data object' in relation to those created by other visitors. The body of contributions – altogether 2840 abstract digital objects were created throughout the duration of the exhibition – are considered as a form of 'audience feedback' and are evaluated using the notion of mapping. Similar to the projects on the smaller scales, the interrogation of the digital is achieved not by studying the challenges in their particular digital context, but through resituating them, here into a spatial and cultural context, in which they can be understood from a range of perspectives.

Fig. 23: The 'States of Mind' console in the gallery space

4.4.1.1 Design Intent and Research Agenda

Through eliciting contributions and repositioning them publicly, the project aims to spatialise mechanisms of sharing personal content within the public setting of the art gallery, offering scope for reflection on issues of privacy in digitally mediated social interaction.[122] At the same time, it tests architectural representation in an interdisciplinary and interorganisational context, producing an output that, while less conventionally architectural than the miniature

122 In contrast to mainstream social media, the activity of sharing here is not aimed at building individual 'profiles', and individual sharing activity instead contributes to a collective 'artwork'—the range of digital objects displayed on a screen in the public areas at FACT Liverpool.

objects and room-scale interventions that precede it, nevertheless builds on the manipulation of the foundational architectural parameters.

Given the density of curatorial content and the amount of challenging works already in the 'Group Therapy' exhibition, it was decided by the team to develop a simple interface and playful, yet simple visual language for the objects to be created by each gallery visitor, offering an intuitive and playful interface that encourages the participation of gallery visitors of varying age and ability. From my own point-of-view as a designer-researcher, the simple nature of making contributions was also driven by my own research ambition of testing tangible ways of engaging with abstract content and the elicitation of personal objects in response to a prompt regarding individual mental wellbeing within the public context of the gallery resonates with the shifting notions of privacy in a digital age problematised through this research.

A range of means were used to evaluate the body of contributions, including a workshop and data visualisations; both aim to understand and contextualise the broad spectrum of contributions. While the notion of mapping already is implicit in the positioning of data objects in relation to one another (Lucas 2016), this steps into the foreground through these processes of evaluation and will be tested further in the final project of this research, for which 'States of Mind' sets out a range of principles.

4.4.1.2 Collaborators

The project brings together practitioners and researchers from across the creative industries and academia. The creative industry partners on the project are FACT Liverpool and 'Nexus Interactive Arts'. Brendan Dawes of 'Nexus' developed the hybrid platform and Robin Crowley built the physical console, with project management support from Claire Spencer Cook. Academic collaborators are artist and researcher Prof. Karen Ingham from the University of Wales Trinity Saint David and architect Roberto Bottazzi from the Royal

College of Art; Ingham's and Bottazzi's contribution were focused on processes of evaluation. Brief and project development, as well as project management, were supported by Tom Simmons, Research Leader in the School of Communication.

The opportunity for this live project emerged from the process of designing the 'Group Therapy' exhibition and conversations with FACT Liverpool's Programme Producer Ana Botella and Curatorial Co-ordinator Lesley Taker; Botella and Taker brought to the team their unique understanding of gallery audiences, as well as their experience in engaging these in meaningful activities.

Appendix 8 offers further detail on individual contributors' backgrounds.

4.4.1.3 Project Description

Focusing on modes of sharing online, the project separates several stages of sharing content, from making the digital objects as reflections on ones own state of mind, to their repositioning within the public spaces of the building. Means of evaluating the contributions have further proven themselves key in driving forward this research.

The hybrid physical-digital console encountered in the gallery space resembles an arcade game machine and features a screen asking the question 'What does your mental health look like right now?', alongside a set of six dials of varying form and in the centre of the dials, closest to the user, a button labelled 'done'. Upon turning one of the dials,[123] the question on the screen disappears, and an organically shaped digital form moves into the foreground (Fig 24). Participants can manipulate the shape from round to spiky, the colours from monochrome to vividly striped, and the size of the object from appearing small on the screen, to an object so large it appears to engulf the viewer beyond the

123 In addition to not being labelled to explain their impact upon the digital object, the dials vary in size and sensitivity: some need to be turned only a fraction, while others need to be turned much further to effect change on-screen; this requires gallery visitors to test the impact of each dial and thus to explore the functioning of the console.

frame of the screen (Fig 25). The abstract malleable digital objects, derived by Dawes from an open-source script, are manipulated by Arduino controllers. This was developed to make three-dimensional digital objects, moderating variables of spikiness and softness, size, colour, and colour ripples. Once the 'done' button is pressed, a message on the screen informs the participant that they can view their contributions outside the main gallery space. Along a public route through the building outside the gallery space and visible to all users of the building, a digital screen shows a selection of shared objects rotating slowly, moving from a display of individual objects, to a set of four, and a grid showing twelve objects. The varying size of the digital objects is revealed when they are shown relative to one another, and occasionally large objects engulf adjacent smaller ones (Fig 26).

To better understand how people engage with the abstract digital language of the manipulable three-dimensional objects, collaborator Karen Ingham

Fig. 24: Manipulating digital objects

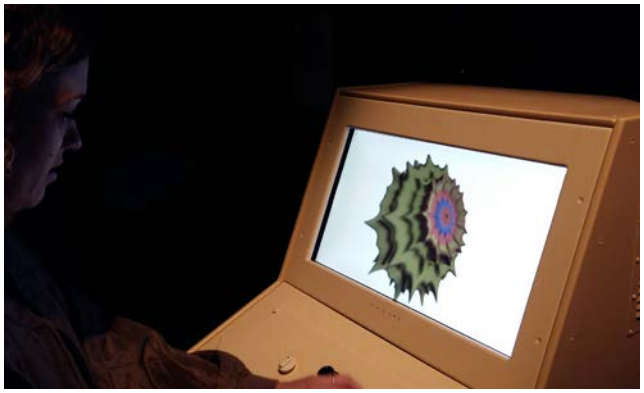
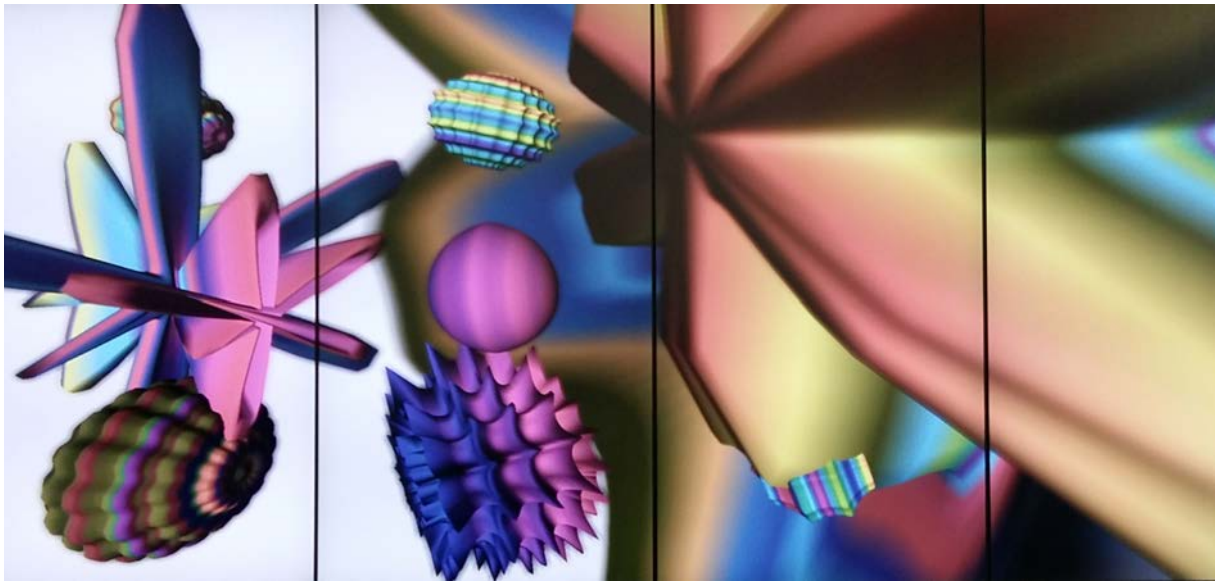


Fig. 25: Large objects seem to engulf the viewer

Fig. 26: Display of objects along public route through gallery building

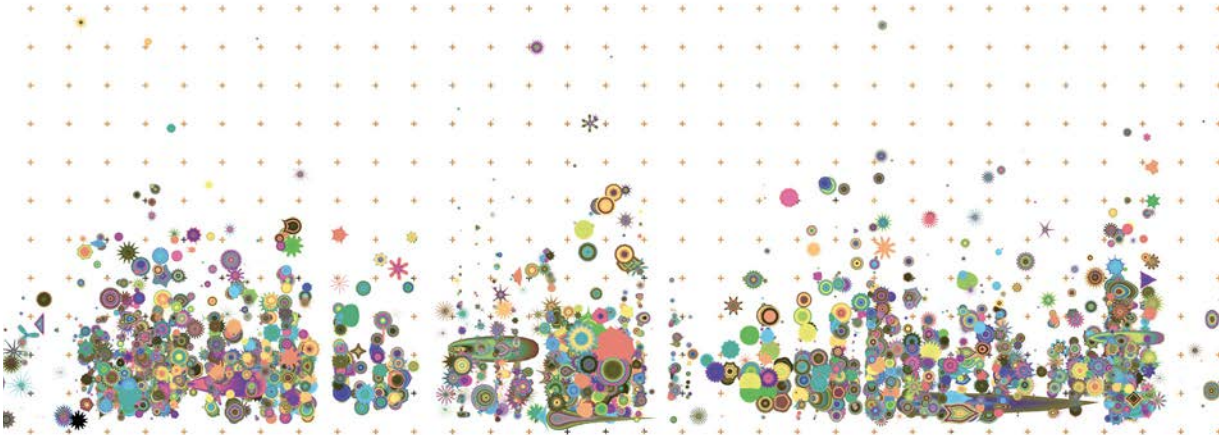


and I ran a one-day drop-in workshop in the 'Madlove' space, titled 'Emotional Landscapes of Liverpool'. Using a sample set of eight single-coloured rapid-prototyped objects that had been shaped using the platform and a 2x2 metre large aerial map of the City of Liverpool, participants were asked to describe the route that had brought them to FACT Liverpool that morning (Figs. 27 & 28). The aim of the workshop was to see how people might relate to the objects in communicating emotional well-being. Interactions with participants ranged from brief chats of around five minutes to conversations lasting longer than thirty minutes. Altogether, 16 participants joined over the course of several hours. Participants were drawn to the map and used this to orient themselves. Further, the brightly coloured rapid-prototyped objects provided a useful entry point into the conversation, especially with gallery visitors who had already made a contribution using the console in the gallery space. Appendix 9 outlines further details of the workshop.

Figs. 27 & 28: 'Emotional Landscapes of Liverpool' workshop

In addition to the workshop as a qualitative means of evaluation, Bottazzi produced a range of visualisations using the range of contributions, aiming to interrogate the diversity of objects and the relations between them. These visualisations are based on the individual variables used in constructing objects, such as colour, size, spikiness and the duration of time taken to make an object. They give an overview over the whole range of contributions. Focusing on the quality of time, Figure 29 shows all of the three-dimensional data objects made by visitors throughout the duration of the exhibition – days are shown on the X-axis – based on the duration taken to make each object, and objects are

arranged on the Y-axis in increments of ten seconds. Alongside these visualisations, Bottazzi also produced a range of perspectival images from 'within' the graphs (Figs. 30 & 31).



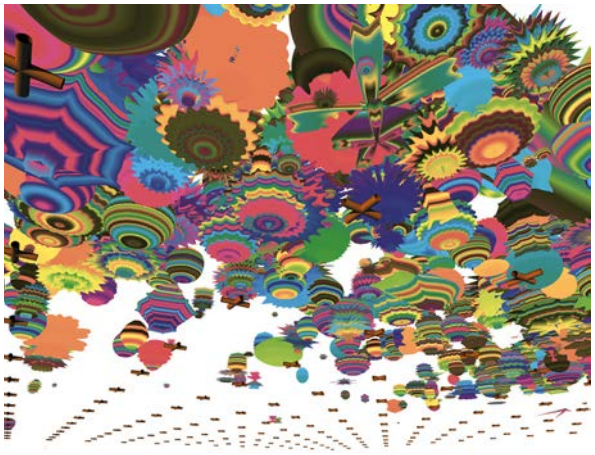


Fig. 29: Data objects mapped against time

Figs. 30 & 31: Perspectival views of data graph

4.4.1.4 Outputs, Insights and Limitations

As a piece of research through design in the context of the wider inquiry, 'States of Mind' is of value in three ways: through spatialising means of sharing content online and through the repositioning thereof without the control of the individual, the project highlights the limitations to individual agency over how content is shared in online social media; the processes of evaluation place emphasis on mapping as a means of positioning and understanding varying pieces of content in relation to each other; and the project offers a structure for eliciting and repositioning content that will be further explored through the final project of this research.

The 'Emotional Landscapes of Liverpool' workshop helped to clarify that participants related their emotions to the attributes of the prototyped objects in varying ways and there seemed to be little consistency in how people used the objects to describe how they felt. Instead of talking about a consistent abstract 'language,' the notion of a 'vocabulary of elements' seems more useful. This notion of a 'vocabulary' was useful with respect to the wider research, which, until that point, had used the notion of a 'language' of architecture in relation to the digital.

Bottazzi's perspectival views of the personal data objects contrast with the graphs that give a distanced overview, establishing varying proximity and a range of relations between different contributions and allowing qualities of colour, shape and scale to be appreciated in relation to each other. This shift from overview to perspectival view echoes the move in this research from providing an overview in the miniature objects, to immersing the viewer within the spatialisations on the scale of the room. Through mapping data objects and establishing relations between them, Bottazzi's visualisations present a form of spatialisation – albeit different to the physical manifestations of abstract elements foregrounded in this research.

As a means of challenging notions of sharing as a particular facet of digitally-mediated interaction that impacts on inherited notions of privacy, the project also presents a key limitation, however: while the user has control over the nature of content they share within the limitations imposed by the dials of the console, they have no control over where this content goes, and its degrees of publicity. The platform shifts the context and with it the audience of the object, reflecting the repositioning of content online that is critiqued through this research and discussed already in the review of the literature (Chapter 2). This lack of individual control over the repositioning of content is addressed in the following and final project, which uses mapping as a means of aggregating contributions and rendering them accessible.

4.4.2 'StoryMap'

Continuing to challenge the retrospective accessibility of shared content in online social media, the 'StoryMap' builds on the 'States of Mind' project to elicit, collate, contextualise and re-present personal contributions in public contexts (Fig. 32). Using the method of mapping, the final project of this inquiry tests means of giving contributors control over where their content is placed by means of representation. The use of mapping is based on the learnings from the evaluation of the 'States of Mind' project, which centred on notions of mapping.

The 'StoryMap' engages the three architectural parameters of scale, distance and time; it focuses on conditions and limitations of the recording of content, interrogating the retrospective accessibility of shared content in online social media discussed in the review of the literature (Chapter 2). The project brings together a means of making contributions, the ability to position these in relation to others, and a mechanism to view all of the contributions (Fig. 33). In this project, the representational device of the map not only serves to navigate distance spatially, but also temporally, drawing together the range of contributions made throughout the duration of the festival.

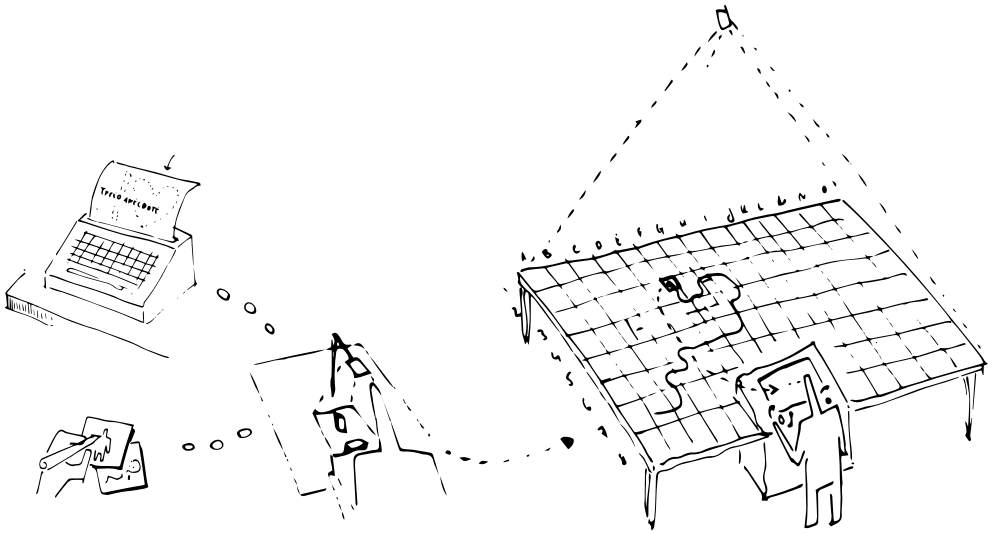


Fig. 32: Stages of sharing content through the 'StoryMap'

Fig. 33: The 'StoryMap' platform installed in the festival hub

4.4.2.1 Design Intent and Research Agenda

The 'StoryMap' continues to push the boundaries of architectural representation in addressing challenges of the digital through design and sets out to test the foundational parameters of scale, distance and time in developing better understandings of the positioning of the individual in digitally mediated interaction.

Building on the experience of the 'States of Mind' project, the 'StoryMap' aims to give greater degrees of control to the individual participant and to enhance a sense of orientation within the network of sharing. It uses mapping as a method of spatialisation to uncover 'relational qualities' (Rendell 2011: 173) of content and to establish distance and connections between discrete elements. The map is tested as a mode of representation to position and access this content in ways that take into account memory, narrative and geographical connections. It is not based on linear sequences of content, for example embodied in the timeline in online networking media, which echoes 'the linear historical consciousness of Western man' (Flusser 2002: 22);[124] the map instead offers the potential for narrative connections to the local area, operating as a point of reference and orientation.

124 As has been discussed already in the review of the literature, content in online social media – through its display in timelines – is largely differentiated by when it is made, rather than by any other quality of content. Further, content shared online has the tendency to persist, even if it is of ephemeral nature, accessible retrospectively, and still in sequence.

4.4.2.2 Collaborators

The creative industry partners on the project are producer Francesca Duncan of charity 'Shakespeare in Shoreditch' and Josh Nawras of delivery partner RIFT; academic collaborators are Peter Thomas, Senior Lecturer in Academic Writing and Language at Middlesex University, Angus Main, an interaction designer and educator, at the time based at Falmouth University, and Jimmy Tidey, a fellow PhD candidate on the CX. Oliver Smith, an artist and developer, realised the technical back-end for the 'StoryMap'. Again, Research Leader Tom Simmons supported brief and project development, as well as project management. Appendix 10 offers more detail on contributors' backgrounds.

Conversations with Duncan and Nawras about potential collaboration started during the inaugural festival in 2014, with the idea of developing a means of engaging the festival audience in meaningful, creative and playful activity, in keeping with the organisations' ambition of encouraging creativity. Once the opportunity had been scoped out to collaboratively develop an audience engagement mechanism that builds on previous interventions by the theatre producers – such as 'Annie's Shed' of 2014, a space in which resident playwright Annie Jenkins encouraged audience members to write a short play – academic partners were brought into the interdisciplinary and inter-organisational team, again spanning academia and the creative industries. None of the new contributors to the project had previously worked with the idea of making spatial online dynamics and sharing mechanisms, bringing new perspectives to the project.

The project brought about a shift in roles that I occupied within the collaborative process. The impetus for the project came through conversations with the cultural partner that also provided the site for the intervention, fuelled by my wider research agenda, which in turn influenced the approach to the project, and is embedded in the project brief. My experience and learning from 'States of Mind' informed discussions about what might constitute

suitable means of engaging with theatre audiences, and helped to structure the approach taken in this project. The collaborative development process is documented through a range of drawings and diagrams, collated in Appendix 11.

Fig. 34: Etched map with digital projection of anecdotes, cursor and trace

4.4.2.3 Project Description

The project was developed for the 'Shakespeare in Shoreditch' theatre festival in 2016, which celebrates the historical and narrative connections between Shakespeare and the London Borough of Hackney.[125] The 'StoryMap' is a hybrid physical-digital interactive platform, located within the festival hub at BL-NK Space on Curtain Road in London's Shoreditch area. A storytelling device for the sharing of local anecdotes, the 'StoryMap' turns the London Borough of Hackney into the navigable 'Isle of Hackney'; it invites audience members to share an anecdote with a connection to the local area and to digitally position this on a large table-based map using a control 'terminal'. This terminal simultaneously is the means to recall individual contributions.

Echoing Kevin Lynch's work on urban navigation (1960), the map contains key routes and a range of local landmarks as orientation points, instead of

125 Two iterations of the festival in 2014 and 2016 were timed to coincide with the 450th anniversary of Shakespeare's birth in 2014, and the 400th anniversary of his death in 2016. The festival saw a range of newly commissioned plays performed in a range of venues around Shoreditch, centred on the theme of the 'storm'.

aiming to provide a geographically accurate representation of the local area. Fictionalisation of the borough and local place names is intended to encourage creative contributions, in keeping with the narrative-based nature of the festival and previous playful means of engaging audiences explored by RIFT.[126] The hand-drawn map is milled into the melamine surface of a 2x2 metre large table, which acts as the projection screen for a digital grid that over time is populated with shared content (Fig. 34). The overall interaction is intended to be playful and inviting: a console with two dials and a screen controls a projected 'cursor' that moves vertically and horizontally across the map.[127] In reference to 'etch-a-sketch' drawing devices, this leaves a trace on the map: a slowly fading red line shows the 'route' taken when exploring the 'StoryMap' via the navigation console, quite literally drawing connections between the various contributions viewed. A screen between the dials enlarges the anecdote positioned on the grid square that the cursor lands on (Fig. 35); grid squares that do not have any content associated with them so far, show a message inviting participants to share an anecdote of their own (Fig. 36). Two typewriters either side of the central console allow participants to type an anecdote in response to a prompt on a sheet of paper (Figs. 37 & 38).[128] Navigating the cursor to the desired location on the map, written anecdotes are shared by placing them in a 'scanner' below this screen, and pressing the 'done' button. The anecdote is captured, and the photograph of it is added to the digital grid projection onto

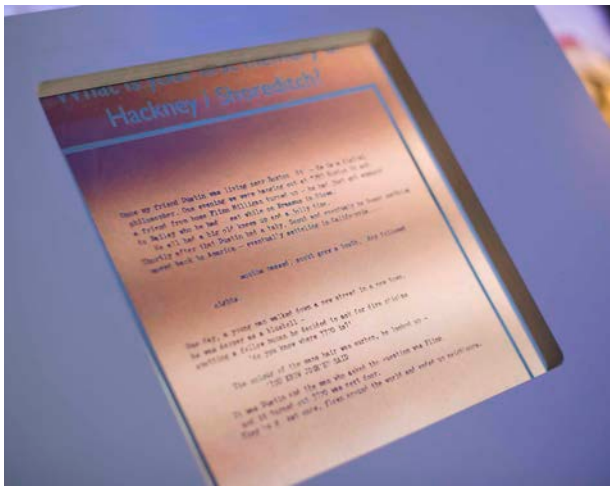
126 Old Street, for example, features as 'Ye Olde Street'; Highgate is a small island pictured with a 'High Gate'; Victoria Park, now located on the shoreline of the 'Island of Hackney' becomes 'Victoria's Beach'; and Stoke Newington – locally known as Stokey – appears on the map as 'Stokeigh'. The reading of the fictionalised map offered conversation points, including a debate that started with "That's not how you spell Stokey!"

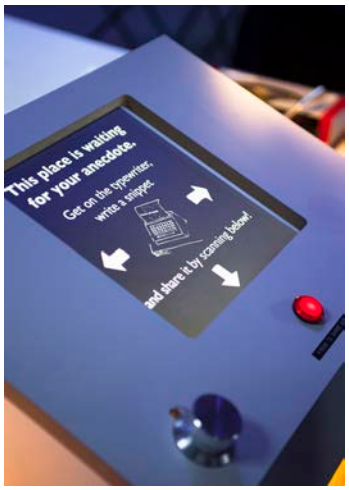
127 Similar to the 'States of Mind' control dials, audience members have to identify for themselves how the dials work, requiring exploration of the part-physical part-digital interface.

128 Prompts encouraged participants to make a narrative connection with the local area, such as: "Have you had any surprise encounters around here?"; "What is your first memory of this area?"; "What is your favourite thing to do around here on a rainy day?"; "What is the best thing that happened to you today?" Sheets with pens were also distributed around the hub space, allowing a greater number of audience members waiting to see a play to share a story.

the fictionalised map for others to discover as they explore the map. Contributors are encouraged to keep their type-written anecdote as a small memento of their festival visit. Through this process of capturing individual anecdotes, the etched map becomes augmented with personal narratives.

The map allows the often place-relevant recorded anecdotes to be recalled in a particular location, operating as the interface for the archive of local stories. This digital 'archiving' of contributions constitutes a further key component of the project, whereby contributions to the map are made accessible to audience members to revisit after the festival in a website format.[129] The hand-drawn map becomes the bridge between interaction within the space of the gallery and the online archive, providing a consistent viewing mechanism.





Figs. 35 & 36: Control terminal

Figs. 37 & 38: Typewritten contributions are made in response to a range of prompts

129 The online 'archive' of the 'StoryMap' shows the drawing milled into the melamine table surface as a layer beneath the grid with contributions. See http://storymap.benjaminkoslowski.com/shoreditch/, accessed 3 Oct 2017.

4.4.2.4 Outputs, Insights and Limitations

As the 'StoryMap' platform builds directly on the structure of the 'States of Mind' console, it is useful here to draw a few parallels between the two projects, elucidating how this last project has helped to further position architectural representation in relation to challenges of the digital.

In focusing on collectively populating the map of the local area with anecdotes, the platform differs significantly from online social media, in which users largely share content associated with their own profiles. The relational positioning of personal content on the 'StoryMap' further shifts scales of perception – from the embodied, one-to-one scale moment of contributors typing an anecdote in the context of the theatre festival, to the projection of 'pixelated' contributions onto the fictionalised map of the wider local area. The hybrid physical-digital interface scales down individual contributions and unifies them in the grid projection overlaid onto the scale representation of the map, connecting content to a physical location. The map thus establishes distance relations and narrative relationships between shared anecdotes. While the scale representation of the map typically brings with it a fixed distance between viewer and the object of representation, the control terminal shifts this viewing distance by zooming in to the map to make individual contributions accessible; at the same time, the viewer is situated within the map, represented by the red cursor, aiding orientation within the representation of the local area and the narratives.

Interaction with the platform was largely gauged through observation and conversation with people in the hub space during the theatre festival.[130] As already had been explored in the 'Emotional Landscapes of Liverpool' workshop of the 'States of Mind' project, the large map is a useful means of drawing people into engaging with the platform; the playfulness of the etch-a-sketch

130 The short duration of the 'Shakespeare in Shoreditch Festival' of ten days allowed me to be present in the hub space throughout the festival, ensuring that the prototype functioned as intended, encouraging theatre guests to contribute to the 'StoryMap', observing interaction with the platform.

inspired control terminal and the two typewriters further helped to draw audience members into sharing a personal anecdote.[131]

While the project places emphasis on the roles that scale, distance and time play in processes of sharing, the largely text-based contributions allow for qualitative analysis. The contributions made with the 'StoryMap' differ significantly from those made using the 'States of Mind' console: in contrast to the abstract digital state-of-mind objects, audience members at the theatre festival are invited to use written language to record a range of anecdotes; Appendix 12 presents a selection of anecdotes. These range from place-specific experiences, to pieces of fiction; contributors augmented their contributions through drawing and 'props'; and participants frequently drew friends in, encouraging them to also share an anecdote, making the process of sharing a social activity, for example using both type-writers simultaneously while talking across the map table.[132]

Through the digitisation of contributions and the online archive, the 'StoryMap' connects back to the digital, rendering content accessible to the audience retrospectively, after the festival.[133] However, while digital content shared through online social networking platforms has the potential to be repositioned – for example through the sharing activity of others in online social media, such as tweeting, retweeting and posting on Facebook – the online archive in web format remains a place people are required to 'go to'; content shared through the hybrid physical-digital 'StoryMap' remains in this archive as a fixed snapshot of the 'StoryMap' at the end of the festival, rather than being relayed to people through individual timelines.

131 Audience members appeared to view the typewriters nostalgically, reminiscing about how they used to use them on a daily basis. A younger audience member, in contrast, was intrigued as she had never used a typewriter.

132 All contributions can be viewed through the online version of the map, available at http://storymap.benjaminkoslowski.com/shoreditch/ (accessed 3 Oct 2017).

133 It is worth noting, however, that the collectively created 'archive' of narratives operates differently to streams of content in online social media, which encourage interaction, such as liking, commenting and sharing. While the 'StoryMap' stores shared content and makes it available retrospectively, the table-based map and the related online archive do not enable viewers to forward this content.

The collaborative process of developing the platform, guided by the architecturally-grounded method of mapping, enabled the project team to think-through notions of sharing within the physical and cultural context of the theatre festival, using spatialisation to develop new ways of thinking about the digital, and drawing on the theatre audience to test and contribute to the platform. Stages of sharing were interrogated in-depth by the project team, from the prompt to audience members to participate, to means of making a contribution and the positioning of shared content by means of the method of mapping. This allowed for careful consideration of the positioning of individual content – and by extension of the positioning of the viewing subject visually navigating the map – in relation to other contributions.

A challenge of interfacing with a live context, which offered useful insights into doing research in such a setting, was the postponement of the festival due to funding challenges faced by the organisers. Importantly for the 'StoryMap', this allowed for more time to develop the thinking behind the project, and to identify a useful strategy for audience engagement that also worked well as a piece of research within the broader context of this research.

4.4.3 Outcomes

The outcomes of the projects on the scale of the neighbourhood are three-fold: the collaborative process with a team of experts results in platforms for sharing content; gallery visitors and theatre audience members make contributions by using the platforms, continuing to collaboratively build a collection of data objects and anecdotes; and through the development of the projects, architectural strategies are repositioned and tested within collaborative, interdisciplinary and interorganisational contexts, expanding conventional architectural design practice and further repositioning architectural representation towards the digital.

The increasingly complex 'materials of the situation' involved brings about a significant shift in my own understanding of the role that architecture can play in research into the digital that is focused on the orientation of the individual. Advancing my own understanding of architectural representation, the capacity of mapping as a form of spatialisation steps into the foreground to situate individual narratives in relation to each; it helps to tame the temporal challenges brought about by online social media, enabling the unpicking and interrogation of online mechanisms of sharing. The 'States of Mind' project introduces a new hybrid approach to sharing personal content; the 'StoryMap' builds on this and offers a more comprehensive interrogation of the fluidity of digital content. It furthermore expands beyond the making-tangible of online sharing mechanisms that are critiqued here, and suggests the map as a means of giving the individual greater agency over the space of reception of personal content, thus helping to orient users in contexts of sharing.

The collaborative and interdisciplinary contexts as test sites demand a clear articulation of the benefits of architectural representation in engaging with the challenges of the digital. Reflection on the projects on the scale of the neighbourhood is key to identifying the contribution this research makes to knowledge, which is discussed in the next and final chapter of this thesis.

To draw the design projects chapter to a conclusion, I will briefly reflect on how the practice-led process has also furthered my understanding of research through design. While design projects can be viewed as independent pieces of design, they are part of a continuous process of research; as such, they answer not only to individual briefs, but to a range of questions brought to them through processes of reflection and the appreciative system as part thereof. In this way, the design projects discussed here play a dual role. By means of the research methods – reflective practice, design situations and the appreciative system relating back to questions around privacy online – they are able to operate as pieces of research.[134] These methods of inquiry enable the 'designer-researcher' to shift emphasis from the 'designer' to the 'researcher', or to switch 'hats' as Findeli et al. call it (2008)[135]; Nigel Cross highlights the importance of reflection in this process (Cross 1999: 9).[136] The methodology of architectural representation is the lens through which the group of projects together contribute to the inquiry as a body of practice-led research.

To recap, Table 4 on the following pages offers an overview of all the design projects, insights gained, and the ways in which each project manipulates the foundational architectural parameters.

134 The project as design output is closely intertwined with the project as research output. As Steve Garner notes in his introduction to drawing research as a field of investigation: 'Expression and enquiry are often closely bound together in the creative process – particularly in drawing – and it is not always possible to tell from the outputs whether a drawing was made as research or not.' (Garner 2008: 16)

135 Findeli et al. discuss the notion of the 'designer-researcher': 'What is new however, and this is no fantasy, is the arrival of a new generation of actors on the design scene, the designers-researchers. We like to call these newcomers the generation of 'enlightened' designers. Designers-researchers must learn to wear two hats and know which is appropriate for a given stage of project-grounded research.' (2008: 83)

136 To quote: 'The whole point of doing research is to extract reliable knowledge from either the natural or artificial world, and to make that knowledge available to others in re-usable form. This does not mean that works of design practice must be wholly excluded from design research, but it does mean that, to qualify as research, there must be reflection by the practitioner on the work, and communication of some re-usable results from that reflection.' (Cross 1999: 9)

Table 4 (following pages): Overview of projects and their relationship to the three architectural parameters

		OVERVIEW	INSIGHTS & LIMITATIONS
MINIATURES	**Privacy Set(ting)s**	early object speculating on physical manipulation of privacy settings in online social media, using spatial devices as props to moderate degrees of access to make more intuitve the ways of manipulating privacy settings in online platforms	limiting metaphorical use of architectural elements to indicate access; focus on social media privacy settings too narrow to develop approaches to understanding the conceptual dimensions of the digital more broadly
	Polly at the Theatre	Small 'Polly Pocket'-inspired shell using the theatre as a typological metaphor for shifting actor-audience relationships in online social media; contains settings from bar, to auditorium, stage, theatre-boxes and backstage area; rapid prototype	sequential positioning of the figurine in relation to others does not capture layered online relations & simultaneous interaction, described by varying proximity / degrees of visibility / scales of audiences
	Polly's Navigational Device	object reflects on nature of accessing content online, contrasting the use of a language of movement with the experience of having content delivered to a screen device; comprises a map with footprints to position figurine & mechanism moving figurines towards a centrally positioned static figurine	helps to critique the metaphorical use of spatial reference points in connoting digital situations and experiences; 'Polly Pocket' **artifacts focus research agenda through reduction in scale**
	The Impossible House	small-scale representation of the landscape of a dream, bringing together into a single designed object a range of dreamt 'moments', which overlap and intersect one another	considering the dreamscape as a virtual space, the object highlights the spatial impossibility of virtual settings; **artifact focuses research and serves as device to communicate it**
ROOM-SCALE	**Madlove Installation**	immersive installation inspired by a broad range of ideas about mental wellbeing and spaces that facilitate it, gathered through user engagement; the space highlights the mediating role of architectural spaces, discussed in the review of the literature in the field	embodiment of spatial constraints & architectural tactics / etiquette with regards to privacy, discussed in the Literature Review; establishes **practitioner at centre of inquiry; emerging dual role of project as piece of research and as independent design project**
	Group Therapy Exhibition	exhibition design embodying shifting actor-audience relationships and modes of encountering information, spatially representing dynamics observed in online social media	shift away from architectural elements (doors, walls and windows) to connote the moderation of distance; spatial experiential constraints emerge (sightlines, distance, degrees of enclosure, peripheral vision & attention); focus of research on reflective practitioner, immersed within a range of design situations with **shifting distance relations of designer-researcher to object of investigation**; key project exploring the dual nature of projects
NEIGHBOURHOOD-SCALE	**States of Mind**	challenging means of sharing personal content in public settings, the hybrid physical-digital platform allows contributors to make abstract three-dimensional representations of their state of mind within an exhibition about mental health in a digital age; shared objects are shown together in a range of configurations	connects the investigation into architectural representation back to the digital & offers a structure to challenge modes of interaction and notions of sharing that have become common in online social media; it presents the basis for the 'StoryMap' project; explores interdisciplinary and interorganisational contexts as sites for architecture to interrogate the digital
	StoryMap	exploring the notion of 'spatialised social media', a hybrid physical-digital platform allows visitors to a theatre festival to share anecdotes using typewriters, adding them to a digitally augmented map that becomes the archive of aggregated narratives	building on 'States of Mind', the project explores mapping as a means of establishing relations btwn narratives & offers contributors control over where shared content is positioned; deepens investigation of interdisciplinary and interorganisational contexts as sites for architecture to interrogate the digital; **propositional beyond merely making tangible observed dynamics through spatialisation**

SCALE	DISTANCE	TIME
1 small-scale object, similar in size to a tablet device; reduces complexity of the object of representation 2 smaller than the viewer	1 uses doors, walls, windows, shop windows, stairs and silhouettes of people as semiotic signs signifying degrees of access; 2 viewing distance established through reduction in scale	1 spatial devices and figures can be moved around to respond to shifting audiences & degrees of access to be granted 2 projective in its intention as a means of manipulating privacy settings
1 the object borrows proportions from the original Polly Pocket toy, designed as a portable toy; reduces complexity of the object of representation; 2 smaller than the viewer	1 positioning of small figurines establishes relationships between actor & audience, focusing on visual relationships btwn self & others; 2 viewing distance established through reduction in scale	object reveals itself at once, yet narratives projected onto it are sequential; figurine occupies only one 'role' or position at a time; retrospective as spatialisation of observed conditions of the digital
1 the object borrows proportions from the original Polly Pocket toy, designed as a portable toy; 2 smaller than the viewer; reduces complexity of the object of representation	1 key difference btwn going somewhere to access content, and bringing it closer to view it; 2 viewing distance established through reduction in scale	object reveals itself at once; requires manipulation to communicate the modes of access to information represented; retrospective as spatialisation of observed conditions of the digital
1 architectural model as scale-representation of the intagible 'scenes' of a dream; 2 smaller than the viewer; reduces complexity of the object of representation	1 object establishes relationships between individual moments, based on narrative sequence of dream 2 viewing distance fixed through reduction in scale; model is entered only visually; access to individual 'scenes' limited through overlap	model fixes a range of conditions in time; while revealing itself at once, individual moments are viewed in sequence, by moving around the object; retrospective in representing already imagined content
one-to-one scale, immersive environment, enveloping gallery visitor (viewing subject), allowing them to manipulate settings by closing doors, drawing curtains, grabbing a blanket for comfort	1 installation describes spatial conditions of privacy: individual space, space for conversation, space for observation and social space; 2 envelops viewing subject, changing their spatial conditions through the manipulation of spatial devices	spatial conditions negotiated through movement of viewing subject and manipulation of basic spatial devices; spatial managing of relations between occupants relies on simulatenous occupation
one-to-one scale, immersive environment, enveloping gallery visitor (viewing subject)	1 frame structures establish settings with varying degrees of visibility & scales of enclosure, ranging from overlapping content to focusing attention in enclosed black boxes 2 immersive space envelops viewing subject, changing their spatial situation through movement	spatial conditions negotiated through movement of viewing subject - change conditioned on movement of body; spatial establishing of relations between occupants relies on simulatenous occupation
scale is largely determined by the appearance of the object on the screen; scale relations btwn objects emerge when objects are shown in groups on the screen in public areas of the gallery	1 shared objects shown in relation to each other; personal object is repositioned in public space; 2 contributors manipulate digital shapes through dials, connecting haptic sense & abstract objects on screen; the screen & public display of objects create distance btwn subject & object	live engagement with platform, and 'feedback' of repositioned data objects; individual state-of-mind objects as snapshots of a moment in time are recorded and shown to a public audience
stories are aggregated in scale-representation of local area, functioning as the archive; these are viewed on a screen, the map itself is etched into a table that the range of contributions are projected onto; reduction in scale allows relations btwn elements to emerge	the map establishes relations btwn individual stories; distance between viewer and platform is mediated by viewing mechanism/terminal that allows the viewer to 'zoom in' to particular narratives	accounts of events across time are recorded through the map, flattening time & presenting narratives as a single artifact; the platform allows them to be recalled retrospectively & seen in relation to each other in spite of time; the map operates retrospectively, recording experiences

5 OUTCOMES AND DISCUSSION

This chapter presents the framework of architectural representation for design and research in association with the digital. It further discusses the role that privacy has played in formulating the framework as the initial trigger for the inquiry and as a key component of the methodological framing through the appreciative system. It further reflects on practice and discusses spatialisation as a new form of architectural representation.

5.1 THE FRAMEWORK OF ARCHITECTURAL REPRESENTATION

The framework of architectural representation for design and research in association with the digital presents a means of thinking about and engaging with the abstract challenges of the digital in spatial, immediate and tangible ways. Developed and tested through the practice-led research evidenced in this thesis, it offers a theoretical position on the efficacy of architectural expertise in the domain of the digital[137] and brings the inquiry to a point of closure

The framework brings together the foundational architectural parameters of scale, distance and time with architecturally-informed methods of spatialisation. It frames the parameters as transferable qualities that can contribute to

137 The contribution this research makes falls into the realm of 'manifestos' and 'frameworks' outlined by William Gaver (2012); due to political connotations of manifestos (Stevenson 2010: 1077), however, it is articulated as a 'framework'; as Gaver notes, 'the framework nevertheless implies a conceptual orientation, and can be considered a form of theoretical output from research through design' (2012: 938).

the reconceptualisation of abstract challenges of the digital and renders them actionable in wider interdisciplinary design contexts by means of the design methods of miniaturisation, immersion, and mapping. Through the application of these methods, the framework thus becomes a diagrammatic means of managing complexity, following architect Rem Koolhaas' notion that architecture 'can become a way of thinking about anything - a discipline that represents relationships, proportions, connections effects, the diagram of everything' (Koolhaas & McGetrick 2004: 20).

There are two aspects to framework: one is conceptual, the other is applied. The framework brings together parameters, which might also be relevant as a largely conceptual lens, and methods of spatialisation, which enable these parameters to be put into practice through design (Fig. 39).

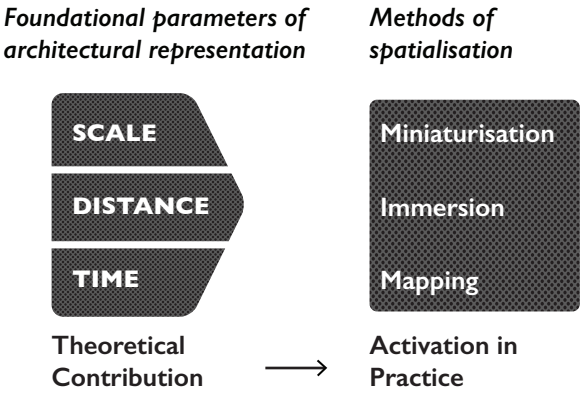


Fig. 39:
The framework of architectural representation

While architects employ the parameters intuitively, they have only emerged as key variables in the framing of experience and interaction online through this practice-led inquiry, drawing on architectural theory and practice. The research methodology of architectural representation has enabled the resituation and architectural reframing of a range of conditions in digital environments, and enhances the capacity of architectural practice to engage with ontological challenges of the digital.

The variable of *time* has a key impact in establishing and testing a methodology of architectural representation to engage with the abstract challenges

of the digital and the dislocation of the individual online: through reconsidering the role of time, the repertoire of architecture to negotiate proximity and visibility in physical contexts is expanded to manage distance relations between things in online contexts with their potential persistence of content.

5.1.1 Purpose and Application

The framework encourages a move away from architecture as metaphor in considering the digital, and articulates base principles of architectural representation that help to consider challenges of mediated communication through design. The framework thus enables architecture to play a role in framing the individual also in *digital* spaces. This differs from a discourse on architecture in association with the digital that is focused on absorbing intangible streams of information within the pre-existing architectural frame (Dade-Robertson 2011; McCullough 2005; Wiberg 2015).

Building on human-computer-interaction scholar Eva Hornecker's and user-centred interaction designer Jacob Buur's notion that '[f]rameworks in general serve to focus our view, providing us with concepts that systematize our thinking and allow for reflection' (2006: 439),[138] the framework aims to offer a filter that supports processes of dealing with challenges in an interdisciplinary manner, rooted in the foundational architectural principles of experience. Further, Daniel Solove notes in relation to his framework for privacy: 'The framework must be concrete enough to be useful, but not so overly contextual as to fail to provide guidance across a multitude of situations.' (2009: 67) As a conceptual 'lens' onto the digital, the framework of architectural representation is positioned against more formulaic approaches to design that focus on identifying patterns and types and aim to provide 'guides' for designing, or are

138 Hornecker's 'Tangible Interaction Famework' deals with social aspects of tangibile interaction from a user-centred point-of-view and resembles the approach taken in this research in its ambition to 'to focus our view, providing us with concepts that systematize our thinking and allow for reflection' (Hornecker 2017).

interpreted as such (Alexander et al. 1977; Alexander 1979; Lynch 1960; Reiser & Umemoto 2006).

In articulating the efficacy of underlying principles of architectural representation – the core modus operandi of architects – in engaging with abstract challenges of the digital, the framework of architectural representation builds on aspects of the Design Council's 'Double Diamond' model (Design Council 2007)[139]. Both articulate specific aspects of design, focusing on process instead of output and content. Further, both are rooted in in-depth study of design practice: the architectural framework is based on my own reflective design practice as an architectural designer-researcher, while the Design Council's design process model is grounded in the study of design processes within leading global industry organisations.

The framework emerging from this inquiry outlines parameters, as well as design methods to activate these parameters in practice: design practice can engage with the complex conditions of the digital by manipulating the variables of scale, distance and time, which have been identified as underlying both architectural practice and the challenges of the digital.

139 The four stages of discover, define, develop and deliver, underpinned the studies I carried out while a Research Associate at the Helen Hamlyn Centre for Design; see Koslowski & West (2014), and the 'Workscapes' project described by Myerson (2016).

5.2 DISCUSSION

This section briefly returns to my own practice and architectural expertise brought to the digital as the focus of inquiry. It discusses the role that privacy has played in this research, and offers reflections on the emerging spatialisations as a new form of architectural representation.

As an architectural designer-researcher, the framework broadens my own design and research practice, enabling me to operate in digital contexts. My reconception of architectural representation and its capacity to engage with ontological challenges that have transcended architectonic space informs processes of thinking about and designing for the digital, without resorting to architecture merely as a metaphorical agent and without focusing on particular architectural output *formats*. Instead, the framework emphasises the *process* of manipulating the architectural variables by means of the methods of miniaturisation, immersion and mapping.

The testing of architectural expertise in aiding the navigation of the complex realm of the digital in this way is symptomatic of the widening remit of the architect, echoing the sense that

> the site in question has expanded far beyond its more recent classification, as the footprint or the building plot, to comprise the myriad concerns of lived experience: spatial, temporal, historical, cultural and environmental. It is a field of material and immaterial influences and the role of the architect is increasingly acknowledged as that of navigation over construction. (Bernie 2011: 115)

Initially aiming to better situate the individual user online, the practice-led research has also turned towards orienting me as the reflective practitioner: the practice outlined here and the emerging architecturally-informed framework position the designer-researcher at the centre of approaches towards the digital.

Under the umbrella of the CX, the range of commissioned and self-generated projects has allowed me to carefully consider applied contexts of my work and has widened the scope of my own design practice as research while maintaining sight of and even enhancing its strengths. Collaborative processes have been less about what we found out together, but about what the collaborative process has enabled me to discover about my own practice. However, the framing of the inquiry through the CX has allowed me to benefit from the complementary skills of collaborators and industry partnerships. Further, the network of researchers across the three CX partner universities has provided a platform for exchange and the sharing of experiences of working in collaborative and interdisciplinary ways.

The interdisciplinary and interorganisational contexts of the CX, which has addressed challenges of communication design from a broad range of disciplinary perspectives, and the RCA's School of Communication that I have been embedded within have demanded a close examination of architectural design practice from within: in order to be able to communicate my research to the wider network of colleagues and collaborators from other fields, these contexts have encouraged me to be both reflective and explicit in articulating my own ways of working. The interrogation of first principles that might be taken for granted in a more contained disciplinary context is reflected in framework as the contribution to knowledge, which seeks to make accessible the underlying principles of my own practice to a wider audience of practitioners engaging with ontological challenges of the digital.

The investigation presented here has enabled the development of an attitude towards research that maintains a focus on architectural expertise and allows this to be oriented towards the digital through collaborative practices. The collaborative processes have shown the value of bringing together people with varying expertise and a range of professional and institutional backgrounds to explore the digital. Working with partners who understand the

framing of experience from a different perspective to me, such as the art gallery that deals with curated content, has enabled the testing of the efficacy of my own architectural expertise and the theory that underpins it in addressing challenges of the digital.

5.2.1 The Role of Privacy and Orientation

The social media mishaps discussed in the introduction of this thesis are symptomatic of the increasing connectivity and visibility driven by networked communication, and online social media in particular, often at the expense of needs and desires of individual users. As such, they have informed the aim of the research to enhance orientation online from the point-of-view of the individual user. The outcome of the research, however, is not a reframing of the concept of privacy in itself; instead, the challenge of privacy as a quality of interaction has helped to identify opportunities for research through design to develop strategies for better gauging relationships between people across diverse realms of interaction. The driving challenge of privacy online builds on the notion that '[t]he intimate is not a space but a relationship between spaces' (Colomina 1996: 28).

In providing a focus and the content for processes of spatialisation, notions of privacy and the orientation of the individual have an impact on framework-building. As Daniel Solove points out in articulating his framework for privacy: 'The framework needs a particular focal point—a lens through which to view the territory.' (2009: 67) The architectural framework emerges as a means of clarifying scale relations, moderating distance relations, and better gauging temporal relations in digital spaces. Privacy as the thematic driver for this investigation has played a pivotal role throughout the development of this framework: it has provided the initial impetus for the investigation and presented the object of representation in testing the three methods of spatialisation and has informed processes of reflective evaluation of the outcomes of this process.

While serving as an exemplar of the disruption of inherited concepts and the resulting disorientation of the individual online, contemporary challenges of privacy and individual orientation online have presented an intangible object of research. The three architectural parameters, activated by the methods of spatialisation, have responded to this and provided a means of rendering the initial object of research tangible and experiential and subjecting it to scrutiny through design practice. Initially, privacy online was both object of representation and object of research, however, through the practice-led inquiry, the focus moved towards design practices that help to rethink conceptual challenges. Privacy online then needs to be considered as the theme of research, or topic, and an exemplar of misunderstandings of digital spaces that architecture might address: the research has been about finding ways in which architecture can engage with these exemplary challenges of the digital. Nonetheless, privacy online and the orientation of the individual in digital spaces remain integral to the research, as thematic drivers, as well as in processes of evaluation, as has been discussed in detail throughout the thesis.

5.2.2 Spatialisation as Representation

This section reflects on spatialisations as new architectural forms of representation that challenge the complex geographical and temporal distancing brought about by digital communication technology. It also touches on the limitations of miniaturisation, immersion and mapping.

The initial study of drawing and other forms of architectural representation offered the ingredients for the development of a new approach to architectural representation through design practice. Spatialisations differ from conventional forms of architectural representation, which are more straightforwardly generative and projective in epistemic design processes and anticipate objects yet-to-be-realised. Instead, spatialisations make tangible a series of abstract conditions and observations of online experiences that exist before

their representation, such as the encounter of information online, or shifting actor and audience relationships, following architect Tim Gough's notion that 'to *communicate* [is] to get across a *content* that already exists' (2016: 9; original emphasis). In this, at a first glance, spatialisations resemble the architectural presentation drawing, as highlighted as a distinct form of architectural representation by Robin Evans (1989).

However, spatialisations demonstrate their generative capacity by resituating the object of representation, which has been the thematic focus of research, from virtual into analog spaces. Framed by a set of research questions, they manifest as new objects and spaces that diagrammatically reframe the object of research and thus encourage a rethinking thereof. The spatialisations discussed in this thesis are representational insofar as they refer to something else – the conditions of the digital they embody in a new way – and in that way are used as a lens onto the digital.

As has been discussed already in Chapter 3, however, methods of spatialisation also present designs in their own right. As a piece of research, the exhibition space for 'Group Therapy', for example, is representational of shifting actor-audience-relationships and the experience of information online; it further tests the immersion of the designer researcher. As a design project, the space frames curatorial content and offers gallery visitors a particular experience. The research agenda has informed the conceptual approach underpinning the design concept, highlighting the mutually beneficial relationship of the two aspects of the project, concurrently operating as a piece of research and a design in response to a design brief.

As explored through the six design projects at the core of this investigation, spatialisations embody varying relations of scale, distance and time: while drawings and diagrams operate at a spatial and temporal distance from the epistemic object, spatialisations have emerged as physical manifestations that can be manipulated through figurines and control terminals and even entered

physically. Spatialisations bridge the distance between the abstract object of representation, which on the level of individual projects is also the object of research, and the designer-researcher, engaging with the slippery object in more immediately accessible ways and allowing it to be interrogated away from its virtual context.

Beyond reducing the complexity of the object of representation, the spatialisations build on the structuring capacity of drawings, diagrams and models, positioning things in relation to each other and establishing distance relationships. The focus of spatialisation is on relationality instead of meaning: as diagrammatic forms of representation, the emerging artifacts and spaces are a means of describing the object of representation in spatial terms;[140] they do not aim to represent accurately, but to condense and simplify. The body of spatialisations is the tangible outcome of the reflective research process, focusing attention and placing emphasis on some qualities over others, thus domesticating the conceptually broad challenges of the digital.

140 It is worth noting that the spatialisations are diagrammatic when considered as representation of aspects of the digital: the immersive spaces, for example, can be read as diagrammatic representations of the encounter of information online and shifting actor-audience relationships, while presenting a fully resolved and functional space in the context of the 'Group Therapy' exhibition.

6 CONCLUSION

Having presented and discussed the framework of architectural representation for design and research in association with the digital, this final chapter concludes the research by firstly positioning the framework as the original contribution to knowledge of this thesis, secondly highlighting limitations, and lastly by discussing directions for future work.

This inquiry sought to offer an understanding of how methods of architectural representation can be used to enhance conceptions of digitally mediated experiences and interaction, which are not framed by spatial settings and architectural clues, with a particular focus on shifting notions of privacy online. The aim of the research has been to enhance individual orientation online; this has provided the thematic content, or topic, for the practice-led inquiry. The objective of research has been to identify ways, in which architectural representation can contribute meaningfully to conceptions of the digital through design practice; through the practice, this emerged as the core focus of investigation.

The process of research has led to the identification of transferable qualities of architectural representation that can help to tackle the challenges of the digital this research has taken an interest in. The review of the literature firstly identified the three architectural parameters of experience – scale, distance and time – and secondly linked them to the challenges of the digital, with a focus on shifting notions of privacy, the disorientation of the individual and intangible, or fluid, online experiences; these have presented the object of representation, interrogated through an experiential and situated approach. Building on the parameters, the methodology of architectural representation has enabled the development and testing of a range of architecturally-informed design methods

– miniaturisation, immersion and mapping – as means of rendering tangible the object of representation.

Through the application of the design methods of spatialisation in a range of design situations, the architectural parameters are manipulated, shifting distance and temporal relationships between the individual and content. In summary, scaling-down makes manageable abstract concepts, allowing the viewing subject to see relations between discrete elements and enabling an 'overview' over a range of moments that are presented simultaneously; this has been tested in 'Polly at the Theatre' and 'The Impossible House', which embody and establish distance relations between discrete elements made tangible within the object, as well as positioning the viewing subject in relation to the object of representation. The room-scale immersive spatialisations focus on the sequential unfolding of experience in relation to the movement of the viewing subject through a space, varying relations between viewing subject and the content of the 'Group Therapy' exhibition. The reduction in scale through miniaturisation and mapping flattens time, rendering the object of representation accessible at a glance; the 'StoryMap' platform, however, introduces the notion of sequence through the 'journey' of the viewing mechanism across the map. Mapping allows collectively made contributions to be positioned in relation to each other over time, and for this information to be recalled at a later date. The parameters support the orientation of the individual in digital spaces, affording the designer-researcher means of engaging with the abstract challenges that drive the inquiry.

Spatialisation emerges as a new form of architectural representation. The group of projects position communication challenges – exemplified by misconceptions of privacy in social media – at the core of this research, making them tangible and experiential through representation. In this, they have been instrumental in testing the relevance and applicability of architectural strategies in relation to the digital. Further, the design projects evidenced in this thesis serve

as 'testimony to the fertility of the overarching theory' (Gaver 2012: 941),[141] presented in the framework.

The gap that the framework aims to address is the lack of adequate means for design to respond to the ontological challenges of digital spaces affecting the individual, both through design practice, and as a mode of thinking about conceptual challenges. The research suggests that an architecturally-informed approach to communication design can help to alleviate tensions arising from the disruption of inherited notions of privacy, for example. The emerging framework of architectural representation is intended as a foundation for engaging with new challenges brought about by digital innovation. It is the vehicle for making the research accessible to a wider audience, articulating principles of architectural representation that underlie the experiential framing capacity of architecture. The framework presents a means for designers to activate these principles in engaging with challenges presented by digital spaces. It further helps architects to articulate underlying principles of architectural representation, enabling them to work in collaborative, interdisciplinary and interorganisational contexts in association with the digital. Crucially, the framework of architectural representation allows the parameters to be put into practice: their application has been demonstrated in this thesis from my own point-of-view as an architectural designer through the use of the newly formulated methods of spatialisation.

141 Gaver proposes the theory of research through design 'as annotation of the artefacts that are its fundamental achievement' (2012: 941).

6.1 ORIGINAL CONTRIBUTION TO KNOWLEDGE IN THE FIELD OF DESIGN RESEARCH

This section discusses the original contribution this research makes. Rooted in architectural practice – carried out by an architect-trained designer-researcher – and oriented towards communication challenges of the digital, the outcomes of the investigation benefit the field of design research, as characterised by Rachel Cooper, Distinguished Professor of Design Management and Policy, in her chapter 'Design Research – No Boundaries' (2016).[142] While she notes the ways, in which design research operates across disciplines and domains, the research presented here benefits from a clear articulation of underlying disciplinary specifics, in order to outline where its contribution lies: the emerging framework of architectural representation for design and research in association with the digital is positioned at the intersection of the design domains of architecture and communication design within this field, making some of the practices and principles inherent in the former available to the latter. This builds on Schön's articulation of architecture as a 'prototype for design in other professions' (Schön 1983/1991: 77) and bridges the gap between the design domains of architecture and communication design in engaging with the abstract challenges of the digital (Fig. 40).

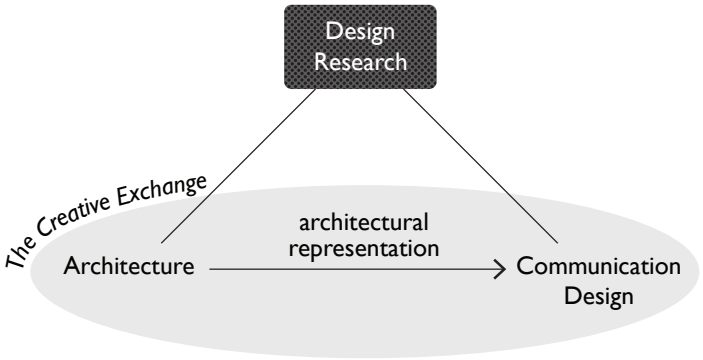


Fig. 40: Contribution to knowledge in the field of design research

142 Cooper charts the evolution of Design Research and advocates new approaches to design in academic contexts that drive innovation and use 'bridging frameworks that link fundamental research to "real world" issues and contexts' (2016: 135).

The inquiry impacts the domain of architecture by enhancing understandings of how architecture might continue to contribute to the framing of interaction and individual experience in a digital age. By testing the efficacy of principles of architectural representation in relation to challenges of the digital, however, the research crucially reaches beyond the domain of architecture: the framework of architectural representation is the means by which the underlying principles, which have been shown to be relevant in reconsiderations of the digital, are exported and made accessible to the wider field of design, orienting architecture and its foundations towards the digital. The knowledge gained from this process of practice-led research is anticipated to benefit in particular the emerging design domain of communication design, which lacks the foundational parameters of architecture to help mediate between individual experiences and information spaces. The qualities of architectural representation explored here are anticipated to offer the domain of communication design a set of principles to expand its own ways of working representationally, helping to develop new approaches of responding to the ontological challenges of the digital.

The research is heavily influenced by Donald Schön's epistemology of practice; following a constructionist paradigm, the design knowledge that emerges from design practice through processes of reflection in turn largely benefits design practices (Cross 2001; Feast & Gelles 2010).[143] Some design knowledge is 'inherent in the activity of designing, gained through engaging in and reflecting on that activity', while other 'knowledge [is] inherent in the artifacts of the artificial world [-], gained through using and reflecting upon the use of those artifacts', as Nigel Cross points out in his paper on 'Designerly Ways

143 As Luke Feast and Gavin Melles point out in their paper on 'Epistemological Positions in Design Research': 'The constructionist position holds that designing in itself is not research unless it is also accompanied by reflection upon the process of making [-].' In reference to Nigel Cross, Feast and Melles further argue that design knowledge in Schön's tradition of an 'epistemology of practice' is developed 'through making and reflecting upon the making of artifacts, and through using and reflecting upon the use of those artifacts' (2010: 3), here the group of spatialisations serving as a lens onto the digital.

of Knowing' (2001: 54). The framework as the core outcome of this research *through* design manifests as research-*for*-design, characterised by 'produc[ing] better conceptual and operational tools for designing' (Manzini 2015: 39).

The contribution this research makes benefits the design *research* community and the design *practice* community: it provides 'fundamental or theoretical knowledge', as embodied in the framework, as well as 'applied and useful knowledge' (Findeli et al. 2008: 74), demonstrated in the range of six design projects that show how the ingredients of the framework might be put into practice, albeit by an architectural designer-researcher. The range of embodied and experiential spatialisations presented in this thesis challenge the notions that 'the language of information is severed from the language of experience' (Colomina 1996: 65) and that '[i]nformation is the other of experience' (Colomina 1996: 66), again establishing links between information, mediated experience and architectural design practice.

Using designer and researcher Elizabeth Sanders' 'maps' charting the design research landscape to position the contribution this research makes to knowledge, the framework of architectural representation falls into the 'expert mindset' (Sanders 2016) and understands design as 'producer of sense' (Manzini 2015: 35).[144] The underlying practice, however, has tendencies of all three of Sanders' 'directions of intent': provoking, engaging and improving (2016: 19).

Processes and projects are reflected in the positioning of the contribution to knowledge within the field of design research: while the outcomes of research provide a framework for the activation of architectural principles in engaging with communication design challenges in a digital age, the underlying research through practice has already straddled the boundaries of the design domains of architecture and communication design. While carried out

144 Sander's diagrams, presented in her chapter 'Where Are We Going? An Aspirational Map' (2016) can be read as building on and complementing Manzini's 'design mode map' (2015), and help to map the shifts in contemporary design and research practices.

by an architect-trained designer, exhibition designs and interactive narrative platforms reflect the interdisciplinary nature of the evolving design domain of communication design, which is being redefined to comprise also the design of experiences and services, for example (Triggs 2015). The umbrella of the CX that has framed the inquiry reflects the interdisciplinary nature of the research. The positioning of the CX at the intersection of academia and industry and the dual nature of projects already discussed throughout this thesis make sense of Sanders' concession regarding the field of design research: 'There is just not much distinction between design and design research anymore, especially in the front end of design.' (Sanders 2016: 18)[145] Allowing me to further enhance my skills as a designer-researcher, the research context of the CX has offered a range of opportunities beyond the inquiry discussed here for testing the application of my architecturally-informed approaches at the intersection of architectural design and communication design, for example as a member of the working group for the CX 'Designing Digital Now' exhibition at FACT Liverpool in June 2016.

Additionally, a variety of pedagogical contexts that I have been embedded within throughout the duration of the research have provided an important means of testing emerging ideas and approaches, helping on the one hand to shape the trajectory of research, while on the other hand aiding the positioning of its outcomes: a six-week project with students in Graphics and Digital Design at the University of Greenwich – outlined in more detail in Appendix 13 – helps to underline the key capacity of *architectural* representation to work at a spatial and temporal remove from the object of design – and in the context of research through design at a remove from the object of research – by means of a reduction in scale. This has been useful in understanding nuances of

145 This also resonates in the dual nature of projects as pieces of design and research, developed by myself as one of the 'new generation of actors on the design scene, the designers-researchers' (Findeli et al. 2008: 83), as discussed already throughout this thesis.

representation between architecture and communication design[146] and helps to clarify the positioning of the framework as the contribution this research makes at the intersection of these two design domains in the field of design research.

Beyond the framework that has been outlined in the previous chapter, the research enhances the field of design research by demonstrating the dual nature of design projects, already discussed in the outcome section of the neighbourhood-scale projects (Chapter 4.4.3): projects present pieces of design in their own right, as well as operating as pieces of research, viewed through the lens of research questions in relation to the digital realm. The design projects on the scale of the room in particular, have offered themselves as sites for research that has expanded beyond the brief of these projects as design commissions. They have served as a testing ground for the interrelations and mutual enrichment of commissioned design work and self-driven research. As Henk Borgdorff notes: 'Epistemic things are precisely these hybrid forms in which thinking and things are interwoven.' (2012: 191)

Further, in addition to forming part of this framework, the architectural parameters identified and tested through this research might be of relevance beyond the field of design research: identified as key principles at stake in digital experiences, scale, distance and time are proposed as points of consideration that are relevant in reconsiderations of the digital and might help the ongoing privacy debate by bringing an architecturally-informed conceptual lens to the rethinking of individual privacy in a digital age. The testing of this, however, is beyond the scope of this research.

146 Further student projects have been useful at earlier stages of the research and are also discussed in Appendix 13: two interdisciplinary workshops at the RCA and a project with undergraduate Interior Architecture students at Middlesex University support some of the limitations of using architecture as a metaphorical reference point in engaging with the digital that had already been explored through the literature, as well as through the design projects on the scales of the miniature and the room.

6.2 LIMITATIONS AND FUTURE DIRECTIONS

This brief section concludes the thesis by highlighting some limitations of the research and pointing towards future directions. Limitations concern the methodology of architectural representation, the notion of spatialisation, and the emerging framework of architectural representation.

6.2.1 The Methodology of Architectural Representation

The framing of architectural representation as a research methodology that has guided this research has enabled me as a designer-researcher to orient my spatial design practice towards the digital; it is rooted in Alain Findeli's framing of methodology as the field of inquiry (Findeli et al. 2008) and Nigel Cross' understanding of design methodology as the study of design processes and thinking, and the 'application of new design methods' (2001: 4). This research methodology has provided an opportunity to bring a range of well-established architectural tactics of negotiating interaction to the abstract and intangible realm of the digital; it has enabled the investigation of practices, rooted in architecture and its well-established approaches to spatial problems, in relation to in-flux and intangible conditions of digital spaces. It further allows the insights gained through the research to be rendered accessible to the wider field of design research in form of the framework of architectural representation. While this presents a point of closure for the inquiry, the aim of research was not to make a case for architectural representation as a methodology, and it has not been tested through this inquiry in the wider context of methodologies. The methodology of architectural representation might then be read as a proposition; however, it is beyond the scope of this research to test this further.

6.2.2 Spatialisation

The new understanding of spatialisation as a form of architectural representation discussed in detail in the last chapter (5.2.2) is key to rendering the insights gained through this research accessible to a wider community of designer-researchers. The focus on the manipulation of scale, distance and time, instead of architectural output formats, enables underlying principles involved in the spatial framing of experience to be brought to the post-spatial domain of the digital. However, the three methods of spatialisation have so far only been deployed in the practice-led research presented here, through which they have emerged. Further work by designer-researchers is required to test processes of spatialisation from a range of disciplinary perspectives.

6.2.3 The Framework

The initial research focus was on the orientation of the individual user in digital spaces; however, designer-researchers, such as myself, have emerged as the main beneficiary of the inquiry and its focus on design processes has informed the framework as the main outcome of the research. The efficacy of the framework in orienting the individual user online remains to be tested further: similar to the methods of spatialisation, which form a core part of the framework, the framework itself so far has been developed and partially tested only in the context of the present inquiry, as a framework for architectural designers to activate the underpinnings of their own practice in new collaborative, interdisciplinary and interorganisational contexts engaging with the digital.

As such, it helps to articulate what architecture can contribute to an interdisciplinary conversation about the digital, focusing on principles of architectural design practice that might not be intuitive to designers in the wider field. On the one hand, this is the result of the context of the CX that has framed this research, and of the nature of the practice-led inquiry on the other hand, that has been conducted from the point-of-view of an architect-trained design-

er-researcher working with and alongside people from a range of disciplinary backgrounds.

The applicability of the framework to the wider field of design, and the domain of communication design in particular, expands beyond the limitations of the research presented in this thesis. As Gaver notes, 'a great deal of design theory tends to be generative and suggestive, rather than verifiable through falsification' (Gaver 2012: 943) and the framework remains to be put to the test in future work, by myself, continuing to work in interdisciplinary and interorganisational contexts, as well as by other designer-researchers embedded within other design domains. Caution needs to be exercised in the testing of the framework and in its potential further development, however, not to assume or suggest that anyone can do what architects do, simply by applying the framework. Instead, it is intended to explicate some of the implicit means of operating architecturally through modes of representation, for the benefit of architects and other designers working on challenges similar to those dealt with in the context of this research.

The process of research has allowed me to build a foundation for my own research and design practice to investigate the ways in which individuals relate to their settings, be they physical or digital. The framework provides a foundation to engage with a range of future challenges and opens up of new contexts for the application of methods of architectural representation, beyond that of privacy online: looking beyond the scope of this inquiry, I anticipate that the framework presented here will form a useful foundation in engaging with new challenges and new forms of interaction and communication brought about by digital innovation. It provides a lens, through which new technological developments that shift individual understandings of scale and our relationship to distance and time can be framed projectively, as they emerge, capitalising on the capacity of architectural representation to anticipate conditions and situations yet-to-be realised.

7 APPENDICES

Appendix 1: Privacy in the Arts

This section offers a selective overview of contemporary artworks and projects engaging with privacy challenges in a digital age. Artworks, such as Zach Blas' 'Facial Weaponization Suite: Fag Face Mask' – a mask based on the biometric facial data of queer men to counter facial recognition algorithms (Furtherfield Gallery 2015; Kholeif 2016) – and 'A Charge for Privacy' by Branger_Briz, a public smartphone charging station that offers users power in exchange for the rights to the photos stored on their phones (Branger_Briz 2012; Furtherfield Gallery 2015), aim to raise awareness of the nature of corporate privacy policies and the handling of individual data.

As the exhibition 'Secret: Nothing to See Here' at the Science Gallery in Dublin (7 Aug 2015 - 1 Nov 2015) further showed, privacy, as an exemplary challenge of the digital age, frequently is looked at in a reactionary manner, considering means of engaging with challenges to inherited notions of privacy, only after they arise. The exhibition largely interrogated notions of privacy in relation to data privacy and surveillance, with interactive interventions using personal details, such as passwords, devices using information gathered from credit cards, as well as the accompanying exhibition website featuring a bot that elicits personal information.[147]

Highlighting ease of access by others to personal information shared online, the theatre play 'Privacy' at the Donmar Warehouse in London (10 Apr 2014 - 31 May 2014) used booking information to gather Google 'streetview' images of audience members' homes and projected these during the play; further,

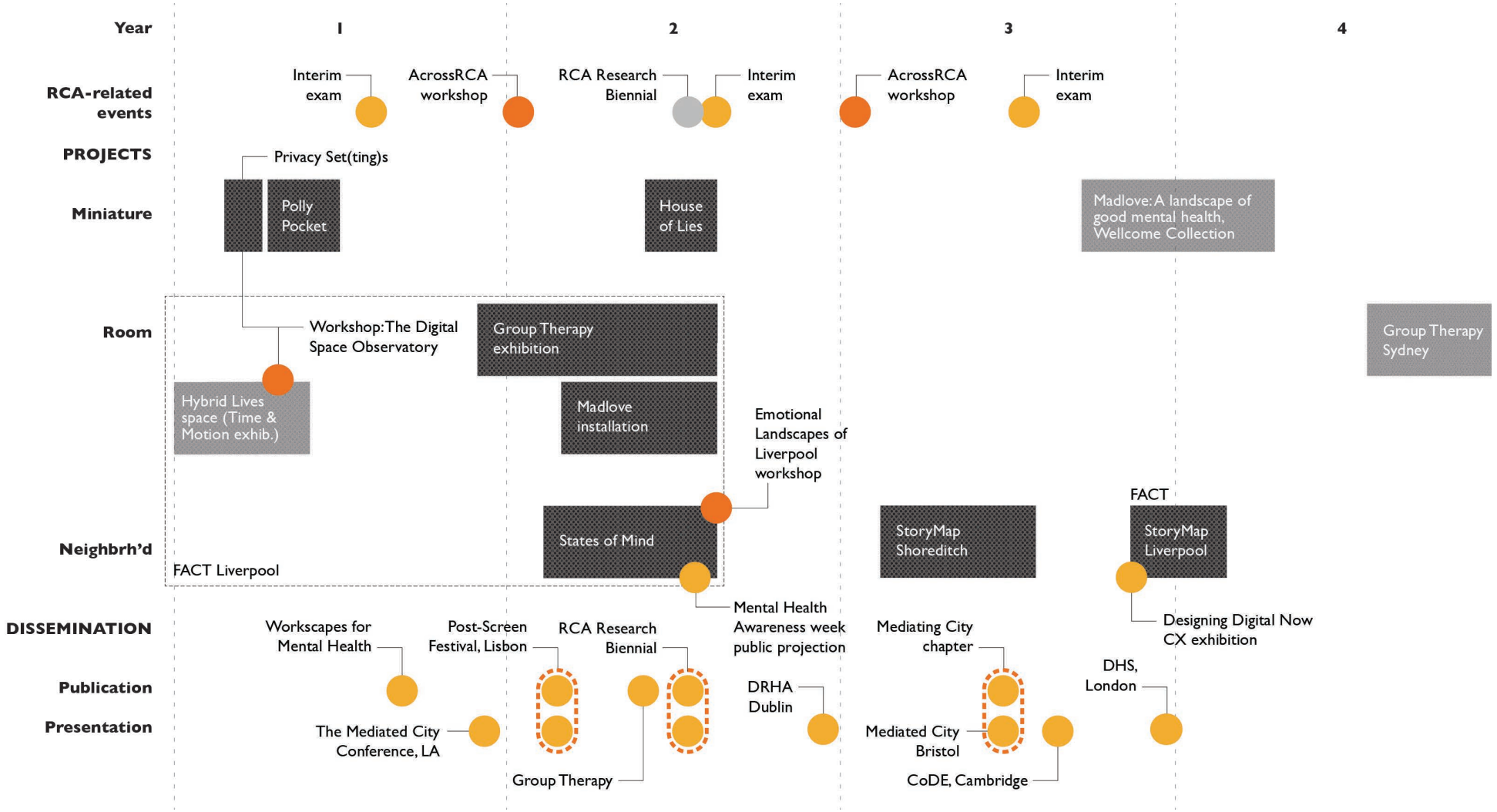
147 See Science Gallery Dublin (2015) and Secret (n.d.) for more information on the exhibition.

audience members were encouraged to send selfies, displaying images on a large projection screen that formed the backdrop of the stage, highlighting ways, in which personal information can be used without one's own control (Fig. XX).

Appendix 2: Research Timeline

The diagram opposite (Fig. 41) shows individual projects, workshops, conference presentations and publications.

Fig. 41 (opposite page): Research timeline


Year
1
2
3
4
RCA-related events
Interim exam
AcrossRCA workshop
RCA Research Biennial
Interim exam
AcrossRCA workshop
Interim exam
PROJECTS
Miniature
Privacy Set(ting)s
Polly Pocket
House of Lies
Madlove: A landscape of good mental health, Wellcome Collection
Room
Workshop: The Digital Space Observatory
Group Therapy exhibition
Group Therapy Sydney
Hybrid Lives space (Time & Motion exhib.)
Madlove installation
Emotional Landscapes of Liverpool workshop
Neighbrh'd
States of Mind
StoryMap Shoreditch
FACT
StoryMap Liverpool
FACT Liverpool
Mental Health Awareness week public projection
Designing Digital Now CX exhibition
DISSEMINATION
Workscapes for Mental Health
Post-Screen Festival, Lisbon
RCA Research Biennial
Mediating City chapter
Publication
DHS, London
DRHA Dublin
Presentation
The Mediated City Conference, LA
Mediated City Bristol
Group Therapy
CoDE, Cambridge

Appendix 3: Spaces of Reception

This section offers an example of how spaces of reception can be disrupted in digitally mediated communication, helping to illustrate the complexities of anticipating contexts of interaction: in 2014, artist Dries Verhoeven showed private conversations he was having on geosocial networking application Grindr on a large screen at the back of a glass-fronted container in the centre of Berlin's Kreuzberg district (Verhoeven, n.d.). The artist created high degrees of public visibility, disrupting the expectations of those he communicated with by publicly screening content understood as private conversation.

Condemned in a statement by Grindr as 'entrapment' (Tsjeng 2014), the art project highlights issues of potential surveillance and mutual consent in the sharing and 'forwarding' of activity in online social media and it exemplifies possible challenges that arise when expectations are disrupted and spaces of reception are not as anticipated, instead affording greater degrees of visibility to and access by others than desired.

Verhoeven's project challenged assumptions Grindr users might have made about contexts of interaction and disclosure, based on their own interpretation of the interface of the platform, which with its 'private chat' function suggests degrees of privacy. The project was prematurely terminated following responses from the public and from individuals who had virtually interacted with Verhoeven and felt exposed by the installation. Somewhat ironically, one of the people Verhoeven had interacted with, made a public post on Facebook condemning his behaviour, again drawing widespread media attention; the degrees of public visibility achieved in this case, however, were intentional and aimed at calling out the artist on his unethical practice, seen as damaging to others (Tsjeng 2014).

Fig. 42: 'Privacy Set(ting)s'

Appendix 4: 'Privacy Set(ting)s'

'Privacy Set(ting)s' is an object made at the beginning of the research process that suggests a way of physically interacting with privacy settings in online social media, manifesting in a 'stage set' enabling the positioning of 'actors' – figures representing oneself and others – and of a range of 'props' that signify means of separation and degrees of visual connection – spatial devices, such as doors, walls and windows (Fig. 42). A key challenge and critique of this object lies in its largely symbolic use of architecture to describe online experiences, where the architectural devices serve largely metaphorically to describe access.

The object was used as a prop in a drop-in workshop organised with fellow PhD candidate Jimmy Tidey at FACT Liverpool on 23 January 2014, during the exhibition 'Time & Motion: Redefining Working Life' (Workshop: The Digital Space Observatory, 2014). Aimed at encouraging participants to think about their online social networks in spatial terms, this also used drawing materials and basic craft materials, such as pipe cleaners and plasticine, to offer simple ways of engaging members of the public. Conversations tended to focus on participant's preferences for specific social networking platforms and it was difficult to relate conversations about digitally-mediated interaction to physical

space, as initially intended in undertaking the workshop. The casual conversations throughout the drop-in workshop highlighted the challenge of engaging non-expert members of the public in research on architecture in association with the digital. Instead, they tended to gravitate towards certain aspects of particular social networking platforms and the behaviours they might encourage, such as 'observing' in contrast to 'broadcasting'.

Together, the making of the 'Privacy Set(ting)s' object and the workshop were useful in steering the research away from a focus on particular online social networking platforms, with their changes in functionality and interfaces; instead, the focus of research shifted towards underlying principles of the experience of online spaces and privacy as a quality of interaction. Further, the drop-in workshop was useful in focussing the research on my own design practice, recognising that designed artifacts, such as the 'Privacy Set(ting)s', might in the first instance be of value to me as the designer-researcher, steering and developing the research agenda. This stands in contrast to the ability of the objects to instantly communicate with a wider audience, and being 'deployable' as tools in the manner that this initial object suggested.

The drop-in session resulted in a dozen in-depth conversations with members of the public. The informal format of the workshop led to difficulty in focusing the conversations on any particular aspect of online sociality; as a result, conversations were mainly focused on the use of social media and qualitative differences between platforms. While the range of uses of online social media was somewhat insightful, future workshop activities might benefit from a more defined group of participants, or a more closely defined workshop brief.

Appendix 5: 'Madlove: A designer asylum' Spatial Design

This section offers a more detailed account of the design ideas behind the 'Madlove: A designer asylum' project, discussed in Chapter 4.3.1.

On the most private end of the spectrum, the 'Screaming Stripes', later renamed 'The Cooling Tower', references the padded cell as a familiar image of the psychiatric institution: the structure is sound-insulated to allow visitors to scream inside and to let off some steam (Fig. 43). On the outside, it is painted in orange and yellow stripes with a nod towards 'Blackpool Rock' sweets. The 'Turkish Delight' offers a space for conversation, a booth for a small group of people, with soft padding limiting sound reverberation and a curtain that can be drawn for privacy. The light pink structure with soft red interior is a cube with scalloped top, as if someone has taken a bite out of it, raised up on legs that leave visible the feet of those in the booth, signalling occupation to the outside (Fig. 44). The orange 'Bookcase Stair to Nowhere' takes the form of a staircase, offering a place to sit and watch the rest of the space from above. Treads turn into shelves housing the 'library of good mental health' that visitors are invited to make suggestions for (Fig. 45). Beneath the stairs is a storage space with materials for workshops and events that can be hosted in the central 'Madlove Oasis' – a large movable table with stools, bordered by a yellow frame structure with a mesh holding plants (Fig. 46). The frame structure aims to make a connection with the wider 'Group Therapy' exhibition, most of which is hosted in Gallery 1, adjacent to the 'Madlove' space. Artist and producer were keen to explore the potential for gallery visitors to personalise the space: a range of scents in diffuser bottles from 'birthday cake' to 'thunderstorm' are offered at the 'Shoes and Smells' stand to be taken into the space to personalise it through scent; sensorial aspects, such as smells, had featured in many of the workshops, the documentation of which offered the starting point for the design project. Upon entering the space, visitors are also invited to take off their shoes to feel more comfortable and to enjoy the soft carpet the whole

space is furnished with. A further element of individual control can be exercised through 'changing the weather': a range of DVDs are on offer to control the projection of weather onto the underside of umbrellas, hung from the soffit to create a suspended ceiling (Fig. 47).

The challenges of providing an environment that can be used by gallery visitors to suit their individual needs, at the same time as fostering conversations about the nature of mental wellbeing and good mental healthcare can be illustrated through the observation of a family in the 'Madlove' space while no programmed activity was happening: the children were exploring the spaces of the 'Turkish Delight' and the 'Cooling Tower', while the mother was on her knees peeking through the slots cut into the cubic seats hung under the table of the 'Madlove Oasis'. The fact that this space was in an art gallery had clearly raised in her the expectation that this is 'art', confusing the slots to ease the handling of seats with an aperture that would 'reveal' something to her. On another occasion, a group of six teenagers, who were in the space during the

Fig. 43: 'Cooling Tower'

Fig. 44: 'Turkish Delight'

Fig. 45: 'Bookcase Stair to Nowhere'

Fig. 46: 'Madlove Oasis'

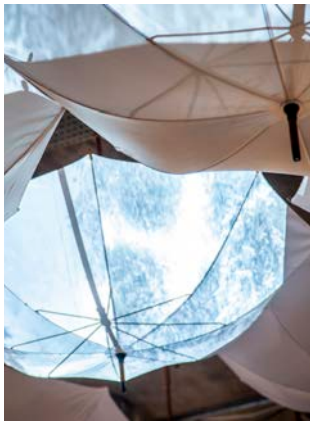


Fig. 47: Weather projection

'Emotional Landscapes of Liverpool' workshop, noisily piled into the 'Turkish Delight' – imagined in the design process as a place for quiet conversation – appropriating the space to suit their needs, shielded from view of other gallery visitors. Observations of this kind have been useful in understanding the ways in which gallery visitors and users of the space engage with the project.

Appendix 6: 'Group Therapy' Spatial Design

This appendix offers a more detailed account of how the exhibition design for 'Group Therapy', discussed in Chapter 4.3.2, frames curatorial content and gallery visitors; the focus here is on Gallery 1, which contained the majority of artworks and digital content on exhibition.

Fig. 48: Gallery 1 artworks

Gallery 1 (Fig. 48) holds thirteen different artworks and six screen-based digital applications, while Gallery 2 upstairs holds the immersive 'Labyrinth Psychotica' and the 'FACT Archive' containing a range of projects that are focused on mental well-being developed by FACT Liverpool and various collaborators over a number of years, presented on flat screens and tablet computers. The focus in the discussion here is on Gallery 1, which presents the most comprehensive deployment of the range of frame structures. The density of artworks resulted in the ambition to give a sense of 'overview' of the exhibi-

Fig. 49: Frame structures permit views across the gallery space

Fig. 50: Screens separate the 'Heart Library'

Fig. 51: Ubermorgen's 'Psychos Sensation'

Fig. 52: The viewer becomes part of the artwork

tion space upon entering, hinting at works yet to be seen.

While many of the frames are open structures, some have white muslin spanned over them, becoming translucent screens, and others again turn into opaque walls. The gallery walls are painted black to recede into the background; all artworks are displayed using the frame structures, including projection screens, surfaces to hold mobile devices and objects, and frames becoming enclosures for sets and black boxes.[148] The frames are painted a dark shade of grey, to avoid dominating the artworks, yet offsetting themselves slightly against the walls. The structures are positioned on a grid that is rotated eighteen degrees off the building grid to separate the spatial intervention from the architecture of the gallery building and to focus attention inwards, towards the

148 The treatment of the gallery space as a 'stage', with a range of structures positioned on it, seeks inspiration in Lars von Trier's film *Dogville* (2003), which helps to consider how a single space can describe a range of conditions of interaction: *Dogville* presents the setting of a small mining town with houses, shops, an assembly hall, or church, and a mine. Instead of a fully constructed realistic film set, the narrative unfolds across a black floor that appears similar to a theatre stage, with a full-scale plan-drawing indicating boundaries, walls and doors; a range of props, such as a shop window, clock tower, writing desk and beds, operate as semiotic signs of use, complemented by annotation on the ground. The props and orthographic drawing on the ground create an architectural backdrop that frames action on-screen and guides interpretation of the narrative. See Koslowski (2016) for an analysis of *Dogville* and the role of mise-en-scène in relation to online social spaces.

prop-like frames and the curated content they hold. Largely ambient lighting emanates from the many projection surfaces and digital screens; additional warm spot-lighting picks out key 'moments,' such as artifacts, photographic works and installations.

The juxtaposition and overlap of content through close proximity and shifting degrees of opacity in the wider gallery, alongside the framing of the gallery visitor as part of the exhibition, contrast with focused attention on individual artworks in black boxes and greater degrees of privacy. In reflection on the exhibition, curator Vanessa Bartlett and I discussed the black box environments as something akin to 'fullscreen' mode on a computer screen, in contrast to situations, where multiple windows overlay each other in a more distracted experience.

Throughout the gallery space, larger, open spaces – for example upon first entering the gallery space and around the centrally placed artwork 'Twelve' – juxtapose intimate and enclosed spaces. The frame structures hold projection screens, digital content, objects, and two-dimensional artworks in ways that permit views across the space (Fig. 49). Superflex's film 'The Financial Crisis', for example, is projected onto a screen at a low level, allowing the gaze to travel across the space upon first entering the gallery to get a hint of Quintain Ana Wikswo's photographic works exploring the historic asylum (see Fig. 19, p. 141). Some of the frame structures have white muslin cloth stretched over them, creating translucent screens, which separate and enclose space while offering a sense of what is behind (Fig. 50). Through this framing of views and the translucent delineation of space, a sense of 'overlap' between artworks emerges, in particular upon first entering the exhibition space. As has emerged from conversations with Bartlett, this seems to have generated a somewhat overwhelming experience for some gallery visitors – a sense of 'information overload', as described by the curator.[149]

149 The challenge between this 'information overload' and the need to contain and

Beyond drawing attention to notions of attention and containment, the framing of the gallery visitor as part of the content of the exhibition has been the key driver for the exhibition design.[150] The varying positioning of the viewer in relation to curatorial content creates a range of viewing conditions: while the gallery visitor maintains peripheral awareness of the wider gallery space, for example when seated within the centrally placed installation for 'Twelve', elsewhere, they are fully immersed in black boxes, where the focused viewing experience is only disrupted by other visitors entering.

Quintan Ana Wikswo's artworks are presented in a corner, as requested by the artist, again created by the frame structures; this corner enables viewers to immerse themselves within the display of photographs and poems by stepping into it, offering a sense of containment.

At the far end of the gallery space, a projection screen is suspended from the ceiling as part of George Khut's 'Heart Library' project; it is tilted towards the entrance of the gallery to offer a glimpse of the colourful heart rate visualisations at the centre of that project, hinting at works at the further end of the gallery upon entering. Translucent white muslin screens here provide a sense of enclosure and privacy for visitors lying down on a bed to experience the visual translation of their heartbeat into a range of images projected above them (see

hold the viewer is the focus of the next iteration of the 'Group Therapy' exhibition at UNSW Galleries in Sydney from September to November 2017. The design for this second iteration is based on joint reflection with Bartlett since the first exhibition, drawing on my own immersion and observations within the space, and on Bartlett's exit interviews and research with gallery visitors conducted at FACT Liverpool in 2015 (Bartlett & Muller 2017). The ways in which the exhibition answers to both Bartlett's and my own set of research questions supports Jane Rendell's notion that 'the collaborative nature of the architectural design process produces a situation where the same building may provide evidence of different contributions to knowledge for each practitioner/researcher involved' (2004: 145).

150 A key reference point in considering ways in which gallery visitors, navigating content by moving through the space, become a part of the exhibition themselves is Peter Greenaway's project 'The Stairs: Geneva' (Greenaway 1994). This saw the positioning of one hundred white structures, each with steps leading up to an aperture functioning as a viewfinder that framed picture postcard views of the city. By stepping up to the viewfinder, members of the public became a part of the artwork as seen by others.

Fig. 20, p.141). A further screen separates a space with a table in which visitors are invited to reflect on their individual experience through drawing; visitors engaging with the project are afforded degrees of privacy through the screens, while other people in the gallery space remain aware of them and can get a sense of the project without invading this space (Fig. 50).

Ubermorgen's 'Psychos Sensation' installation comprises a set referencing the psychiatrist's office and an interactive digital application. Translucent muslin screens here also give a sense of enclosure for those sitting down on one of the two Chesterfield armchairs, while an opening allows views into the set from the gallery space-at-large; visitors sitting down interacting with the digital application on a hand-held touch screen become a part of the installation, again blurring the boundary between content and viewer (Fig. 51 & Fig. 22, p.141).

Another installation challenging the relationship between audience and content is Melanie Manchot's 'Twelve', developed in collaboration with mental health service users. Positioned at the centre of Gallery 1, the installation gives a nod towards the title of the exhibition, positioning three chairs and three LCD flat screens at seated eye-height in a circular 'group therapy' set-up. Sitting down, gallery visitors are in 'conversation' with screens and other gallery visitors (Fig. 52). Further, they see other gallery visitors moving around the space from this central position, while themselves becoming a part of 'Twelve'.

The low rhythmic beat and the voice of the psychiatrist character in Superflex's piece, encountered upon first entering the gallery space, follow the gallery visitor around the space, bleeding across the space and setting the tone for the overall gallery experience. In contrast to the moments across the gallery space described here that offer a sense of artworks at a distance, three black-box spaces contain the viewer watching film-based pieces: 'Black Dog' by Kate Owens and Neeta Madahar, Lauren Moffatt's 'Not Eye', and Katriona Beales' mixed media piece 'White Matter'. The sound-insulated spaces create immersive settings, sealed off from the wider gallery space; these are the only spaces

within the gallery that have their own distinct ambiance, separate from the information-heavy open gallery space, and offer a more immersive and private experience of the setting of the gallery that allows visitors to focus on individual pieces.

Relating the exhibition back to the wider inquiry presented here, the challenge of technologically-induced or amplified anxiety and this research into the efficacy of architecture and spatially-informed thinking to clarify the positioning of the individual online follow on from the close proximity to others in the city and required tactics for dealing with this, as outlined by Thackara:

> Urban anxiety is part of our culture. Psychologists who study the phenomenon have discovered the importance of what they call "situated understanding"—a clear mental picture of an artificial environment, which contributes to one's mental health.' (Thackara 2005: 105)

The design project for 'Group Therapy' returns to questions already posed by Georg Simmel in his discussion of the individual's ability to retreat from the view of others in the metropolis (1903/1969), as discussed in the review of the literature (Chapter 2).

Appendix 7: Hybrid Digital-Physical Projects

This section offers further detail on the neighbourhood-scale projects, discussed in Chapter 4.4.

The hybrid physical-digital approaches to both projects have been informed by practical constraints of engaging with audiences in live cultural contexts: in addition to returning the research narrative to a closer investigation of the digital, testing architectural representation in collaborative and hybrid physical-digital contexts, a range of practical constraints have encouraged a return to the digital as the problem space of the overall research. Digital, or digitised, contributions can be repositioned swiftly, and may be recalled easily. In the case of the 'States of Mind' project, this re-presentation is an evolving display of groups of objects, while the 'StoryMap' aggregates contributions on the map and later becomes an online 'archive' to be explored by theatre festival visitors.

Further, contributions that are recorded digitally can be analysed, for example through data visualisation. Roberto Bottazzi's data visualisations on the 'States of Mind' project use digital information and scripting to test ways in which the individual contributions might be viewed in relation to each other. The production of a digital output that allowed the exploration of large amounts of object – gallery visitors contributed 2840 data objects throughout the duration of the exhibition. Further, the development of products aiding participation that organisations, such as RIFT/Shakespeare in Shoreditch and FACT Liverpool, can use to engage with their audiences, was an ambition of the projects. This demanded an approach to prototyping that can be developed and adapted to suit shifting contexts, making an at least partially digital approach useful. Further, two collaborators on both projects, Brendan Dawes and Angus Main, were brought into the conversation due to their interests in exploring tactile interfaces with digital information.

Appendix 8: 'States of Mind' Collaborators

This section offers additional information on collaborators on the 'StoryMap' project, discussed in Chapter 4.4.2.

Brendan Dawes is interested in the physical interaction with digital content and works with 'Nexus Interactive Arts', who are experts in developing engaging experiences for a range of audiences, including projects that straddle the line between the physical and the digital; Nexus have previously worked in cultural contexts, such as galleries and museums. An interactive project developed by 'Nexus' contributors Johnny Kelly for the 'Memory Palace' exhibition at the Victoria and Albert Museum was an initial reference point for 'States of Mind', and 'Nexus' were brought into the conversation as soon as the opportunity had been identified with FACT Liverpool to develop an intervention for 'Group Therapy' (Sky Arts Ignition: Memory Palace 2013). The 'Memory Bank' project invited gallery visitors to draw or write or draw a memory on an iPad. Upon submitting a contribution, participants could see their drawing and notes becoming part of a large digital poster; at the end of each week, a new poster was screen-printed with all the contributions made in that time frame, and added to the poster wall in the gallery space; contributors were also emailed a digital copy of the poster that contained their contribution.[151]

Prof. Karen Ingham from the University of Wales Trinity Saint David has a background in work on well-being, the human body, and the visualisation of brain activity. Ingham brought to the project her interest and experience in making tangible brain activity through forms of visualisation, which offered synergies with my own research agenda. Throughout the process of developing

151 Initially, the project team had discussed ways of also giving contributors to 'States of Mind' a 'reward' or a 'souvenir' as a reminder of their contribution and as a means of encouraging people to continue to reflect on mental wellbeing. One option discussed was to print an image of the artifact for gallery visitors to take away, reminding them of where and when the object was made. Due to the large numbers of visitors to the galleries at FACT Liverpool, however, it was decided that this was not a workable solution. In the end, it was decided that the making of the digital object and its repositioning within the context of FACT Liverpool would be sufficiently rewarding to contributors.

the ‘States of Mind’ project, Ingham remained acutely aware of the need for this project to be able to further the overall research it forms a part of. She also documented the project through film and ran a drop-in workshop with me to evaluate ways in which gallery visitors engage with the digital objects to talk about wellbeing (see Chapter 4.4.1.4 and Appendix 9).

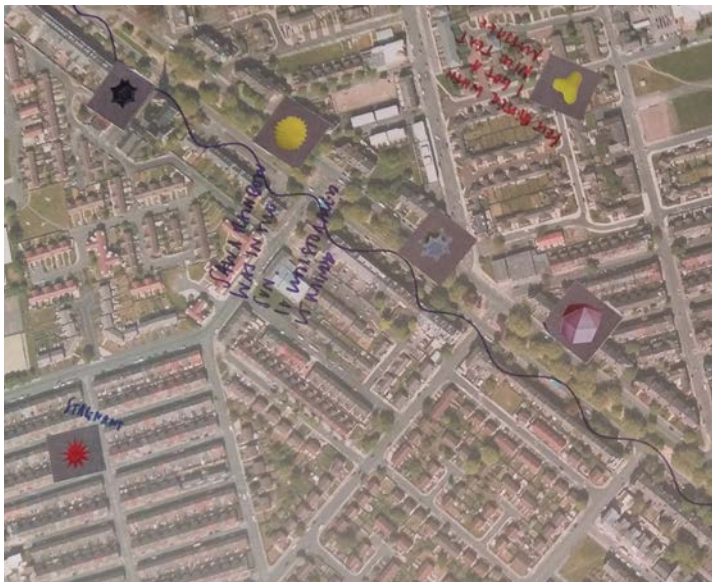
Roberto Bottazzi from the Royal College of Art has an interest in data visualisation and the impact of big data on cities, offering a counterpoint to my own focus on the individual and their position within networks of sharing. Due to time constraints and the fast turnaround required to develop the project in time for the opening of the ‘Group Therapy’ exhibition, Bottazzi focused his contribution on the period of evaluation of the data contributed by gallery visitors. He developed a range of data visualisations that explore the potential relationships between the range of digital objects, which are discussed in Chapter 4.4.1.4.

Appendix 9: 'Emotional Landscapes of Liverpool' Workshop

The prototypes used in the 'Emotional Landscapes of Liverpool' workshop ranged from spiky objects to rounded and softly shaped ones, in a range of colours. Some participants used one object to represent their overall emotional journey, while others drew on a range of the objects to describe their route through the city and their changing emotional state in response to particular events en route, leaving a trail of state-of-mind objects on the map, each object standing-in for a particular mood (Figs. 53 & 54).

While the star-shaped and spiky black and red objects were used frequently to describe a state of anxiety, one participant used the black object to describe a range of ups-and-downs experienced that day, running hands over the peaks and troughs of the object while talking. Some participants were drawn to the colour of objects, for example the slightly iridescent mother-of-pearl-coloured object, while others seemed to focus on the shapes; the spherical object, for example, was held up to describe a feeling of satisfaction or contentedness; holding up the object: "I feel kinda humm. I can't quite put in words but it's kinda like this." Except for one person, all participants were able to relate the objects to descriptions of their emotional journey.

Figs. 53 & 54: Traces of objects used to describe emotional journeys



Appendix 10: 'StoryMap' Collaborators

This section offers additional information on collaborators on the 'StoryMap' project, discussed in Chapter 4.4.2.

Peter Thomas brought to the project strategies around the construction of writing from a pedagogical perspective. Work with him focused on the nature of interaction and engagement with audiences, as well as on reflection on contributions. A joint paper, presented at the *CoDE: Cultures of the Digital Economy Conference 2016,* at Anglia Ruskin University, Cambridge, (12-13 May 2016) under the title of 'Landscapes of Sharing: Representation for audience engagement in live cultural contexts', discussed forms of representation as ways of negotiating boundaries between personal and shared experience. Discussing the 'StoryMap' in relation to the 'States of Mind' project, the paper presented an opportunity to reflect on modes of interaction developed for the 'StoryMap', as well as analysing contributions.

Angus Main's practice uses analog interfaces to make data tangible. He has taught on the Information Experience Design (IED) programme at the Royal College of Art, working with students to develop engaging and tangible ways of communicating abstract information and data, for example in the sciences. Focusing on means of engaging audiences, Main diagrammed out the potential technical mechanisms that could facilitate the processes of sharing anecdotes. His suggested structure was used to brief programme developer Oliver Smith, who developed the technical back-end of the project.

Smith's work moves across physical and digital interfaces and he was briefed once the core project team had identified the desired means of interaction with the theatre audience.

Jimmy Tidey has a background as a developer and brought to the project his research interest in driving community coherence in geographical areas through locally enhancing connectivity between users of social media networks. A second iteration of the project saw the integration of the 'StoryMap' platform

with Tidey's 'Localnets' project for the CX 'Designing Digital Now' exhibition (Fig. 55), held at FACT Liverpool in June 2016; see http://storymap.benjaminkoslowski.com/liverpool/ (accessed 3 Oct 2017).

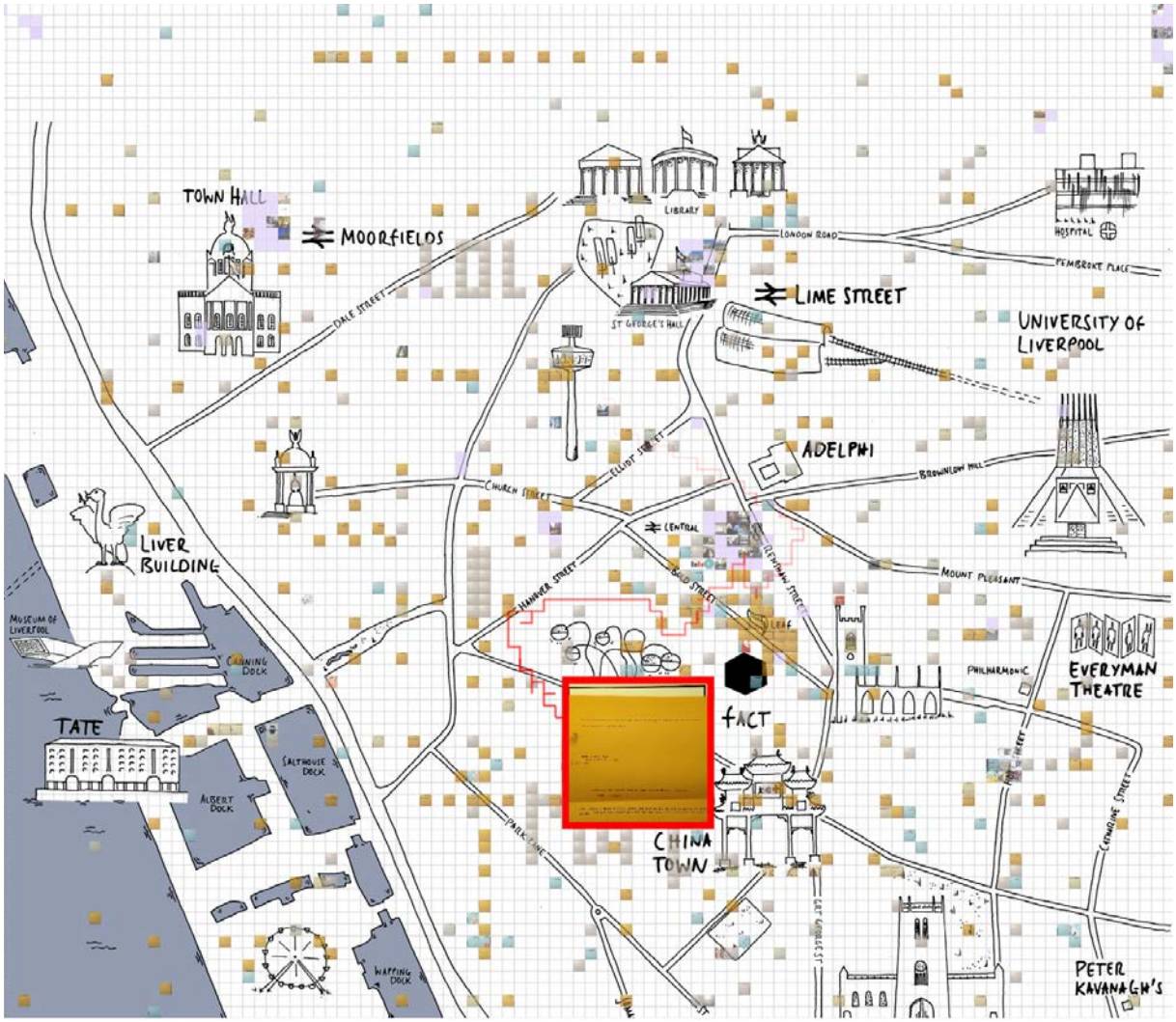


Fig. 55: Screenshot of the online version of the 'StoryMap' of Liverpool

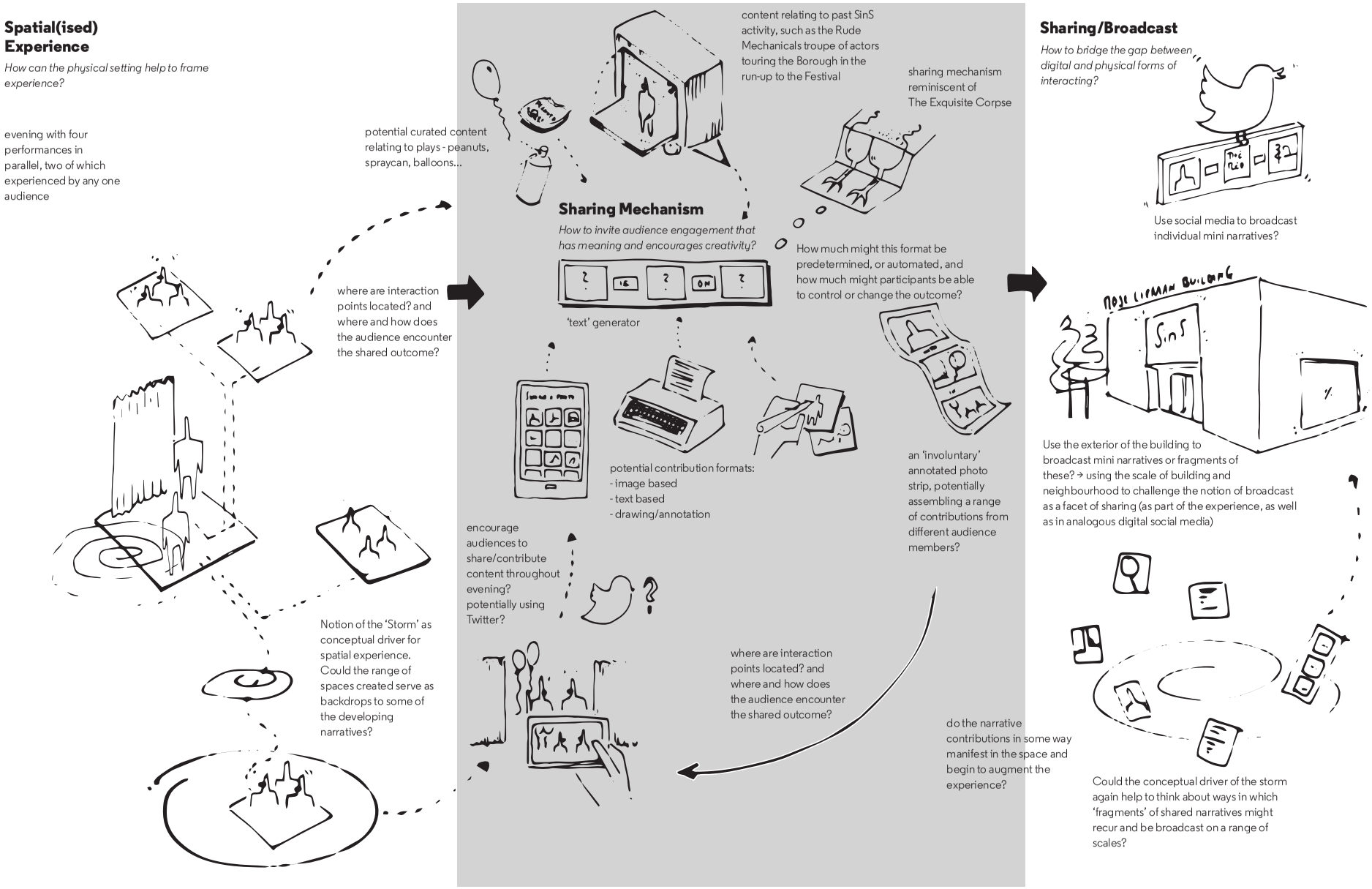
Appendix 11: 'StoryMap' Collaborative Development Process

This section includes a range of diagrams that chart the development of the 'StoryMap' project. These were circulated by me via email as a form of note-taking following project team meetings, further intended as a means of continuing the conversation and to outline in diagrams how the sharing mechanism might work.

Potential approaches included collaboratively creating a play that might be enacted within the space, ways of responding to plays co-written with audiences in 'Annie's Shed' during the previous festival in 2014 (Jenkins 2015) and the notion of a 'Rude Mechanism' that might reposition contributions made by audiences; this aimed to make a connection between the 'Rude Mechanicals' performing Annie's 1000 Plays across the London Borough of Hackney in the run-up to the festival, and the new set of plays centred on the notion of the 'storm', commissioned by RIFT and 'Shakespeare in Shoreditch' for the 2016 festival.

As a visual form of documentation, the diagrams capture the narrative elements of the project, such as the 'storm' as a central theme for the 2016 'Shakespeare in Shoreditch Festival', and attempts at identifying how they might be brought together with the sharing mechanism.

Fig. 56
(opposite page):
Project diagram
8 Oct 2015


Spatial(ised) Experience
How can the physical setting help to frame experience?
evening with four performances in parallel, two of which experienced by any one audience
potential curated content relating to plays - peanuts, spraycan, balloons...
content relating to past SinS activity, such as the Rude Mechanicals troupe of actors touring the Borough in the run-up to the Festival
sharing mechanism reminiscent of The Exquisite Corpse
Sharing Mechanism
How to invite audience engagement that has meaning and encourages creativity?
where are interaction points located? and where and how does the audience encounter the shared outcome?
'text' generator
How much might this format be predetermined, or automated, and how much might participants be able to control or change the outcome?
potential contribution formats:
- image based
- text based
- drawing/annotation
an 'involuntary' annotated photo strip, potentially assembling a range of contributions from different audience members?
encourage audiences to share/contribute content throughout evening? potentially using Twitter?
Notion of the 'Storm' as conceptual driver for spatial experience. Could the range of spaces created serve as backdrops to some of the developing narratives?
where are interaction points located? and where and how does the audience encounter the shared outcome?
do the narrative contributions in some way manifest in the space and begin to augment the experience?
Sharing/Broadcast
How to bridge the gap between digital and physical forms of interacting?
Use social media to broadcast individual mini narratives?
Use the exterior of the building to broadcast mini narratives or fragments of these? → using the scale of building and neighbourhood to challenge the notion of broadcast as a facet of sharing (as part of the experience, as well as in analogous digital social media)
Could the conceptual driver of the storm again help to think about ways in which 'fragments' of shared narratives might recur and be broadcast on a range of scales?

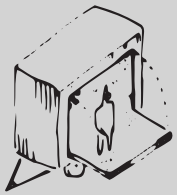
THE RUDE MECHANICALS

Duration

10 days

Location

Touring across Borough of Hackney



Content

The Rude Mechanicals are a touring troupe of actors enacting Annie's 1000 plays in the run-up to the 2016 Festival at the RoseLipman building. They are the culmination of the year-long process that has enabled the audience to contribute to the challenge of writing 1000 plays in 10days during the 2014 Festival (published April 2015).

Aim

Activating the co-produced content in settings across Hackney; reaching out to local communities; promoting the Festival. Encouraging audience to 'help' perform the plays, through (1) acting, (2) provding or acting as props, and (3) documenting. The audience with smartphones might be considered as a 'dispersed cameraman' - it continues to contribute to the making (and documenting and sharing) of cultural content; is there a call to capture and 'help archive', in a similar way to the call to help write the 10 plays in the first instance?

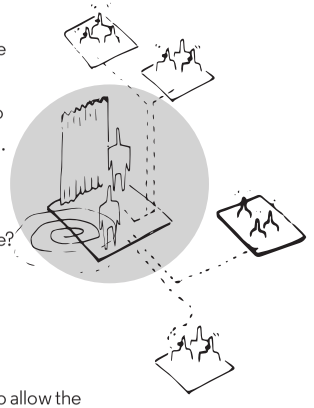
Structure

SinS Festival Hub

10 days

Rose Lipman Building, Hackney; one site nearby (gallery by canal)

4 plays as an evening of performances: audience groups experience 2 plays each. The central hub space funtions as social space, as well as offering an opportunity to contribute to the ongoing content ('archive'?) of the festival.



Is the documentation of the performances of the rude mechanicals evident within the space? Is this being shaped and reshaped through a 'mechanism' that allows the audience to contribute?

The setting of the hub offers the opportunity to allow the audience to contribute and collaboratively create new narratives (or plays), that might borrow from the previous 'production cycle'; these might be enacted and captured instantly, adding to the ongoing cultural archive of the Festival.

is there some 'trace' of the Rude Mechanicals at the Festival Hub?

might the 2016 Festival mechanism replicate the structure of the previous cycle within each evening?

Fig. 57:
Project diagram
2 Dec 2015

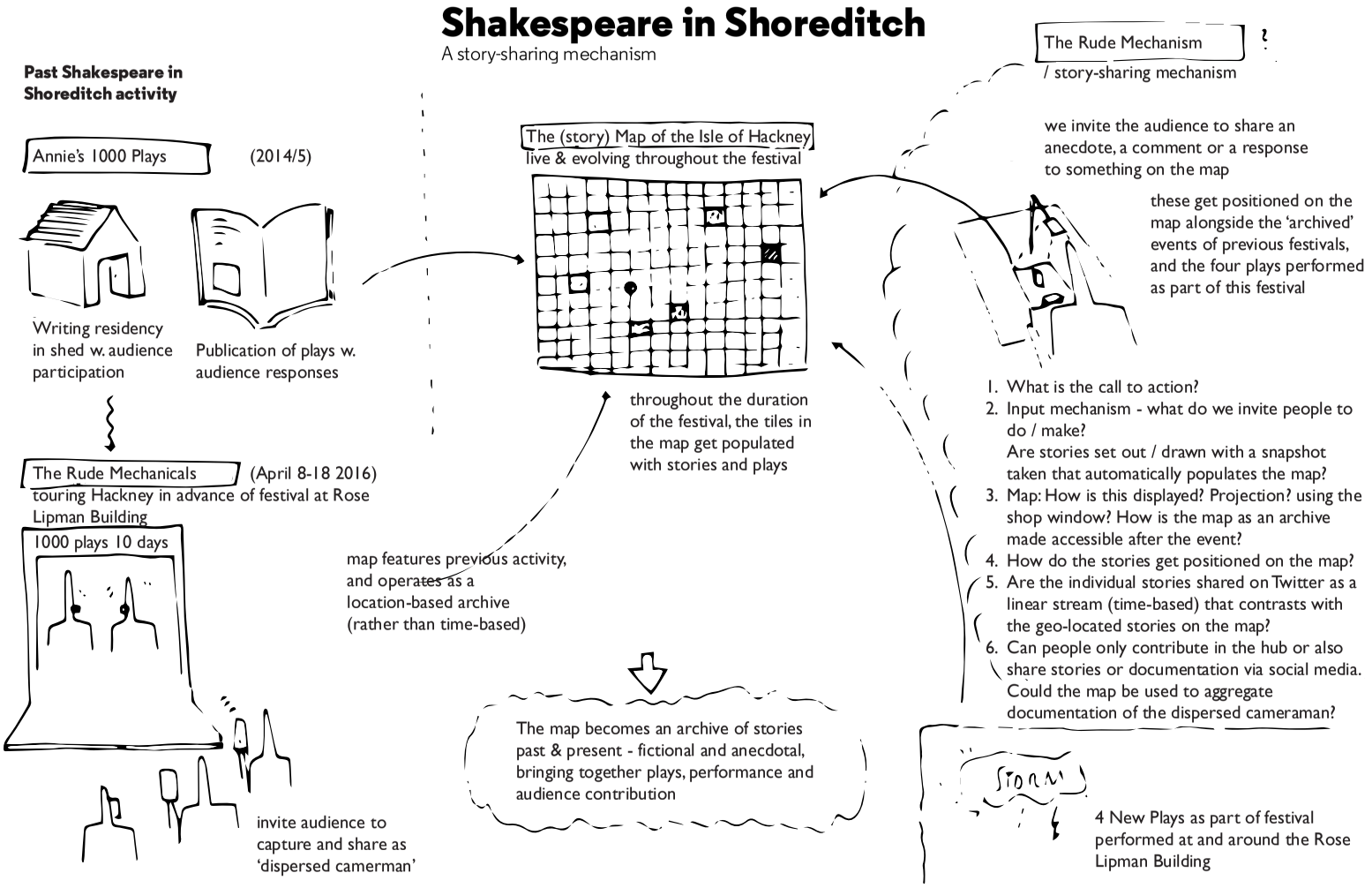


Fig. 58:
Project diagram
22 Jan 2016

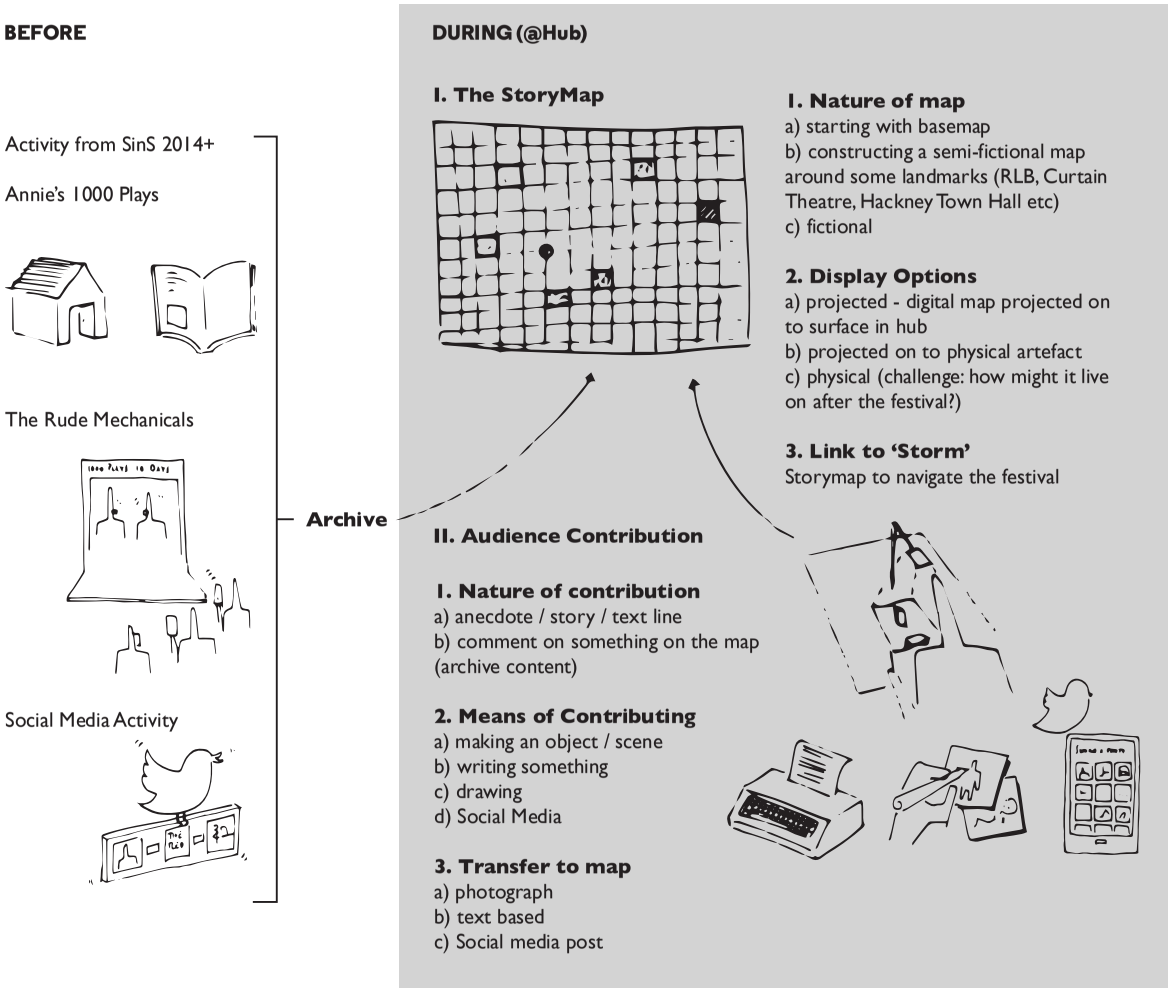
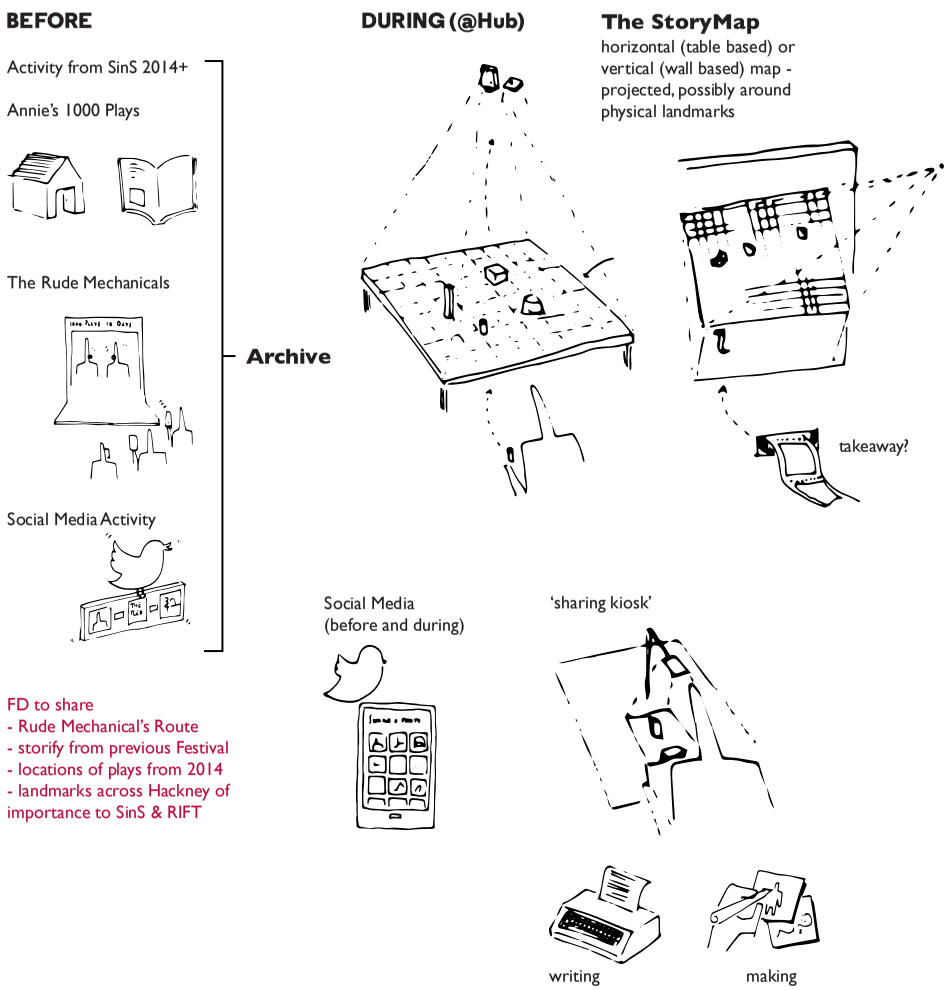


Fig. 59:
Project diagram
11 Feb 2016



CHALLENGES

1. Call to action
- share an anecdote
- document the Rude Mechanicals

2. Making Contributions
a) images through social media,
b) text-based anecdotes through 'sharing kiosk'
c) make an object - photographed (or shared via social media?)

3. Relationship between different types of content (Annie's plays, photos, tweets, anecdotes, ...)

4. Positioning contribution on map
a) place an object
b) place a pin
c) allocated to nearest 'landmark'

5. Digitising contributions and making them part of the map
- *what are our technical limitations and what might we need to outsource?*

6. Feedback / Reward
a) receipt/ticket
b) watermarked sheet from typewriter
c) ...

7. Online map-archive
- share link as part of event
- is it the same map projected in Hub?
- does it continue to add contributions?

NEXT STEPS

FD / PT / BK

ALL

FD / PT / BK

AM / JT / BK

AM / JT / BK

ALL

AM / JT / BK

week/c Feb 22 - workshop around types of content and how they might create and make sense as a map

week/c Feb 22 - understand technical constraints of map

Fig. 60:
Project diagram
15 Feb 2016

CHALLENGES

1. Call to action
- Share an anecdote and draw the StoryMap of Hackney/Shakespeare in Shoreditch with us.
? Call to action for documenting Rude Mechanicals?

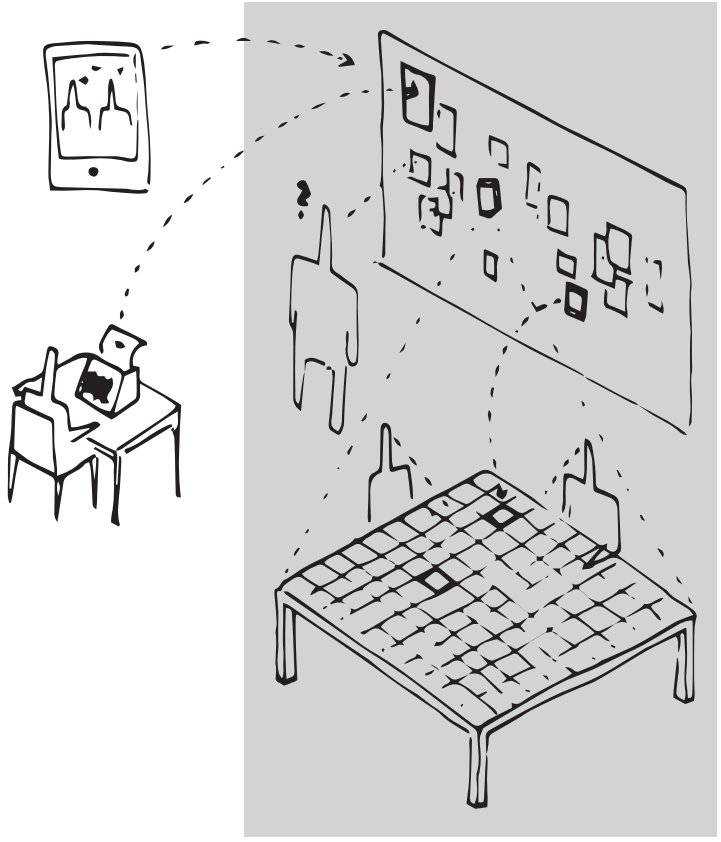
2. Does the interface require signposting / instruction? How do we inform a participant about the map? How do we encourage them to contribute?

3. Do we want to prescribe features of the anecdotes? We could present participants with an exquisite corpse-like structure for their contributions (e.g. Characters; Setting; Action / Dialogue; Consequence). This might generate interesting contributions because of the way that prescription / limitation focuses the mind. - or perhaps these might merely be suggestions in case people don't know what to do.

Contributions to map

Social media - text and image based content

Contributions in form of 'anecdotes' made via typewriter in the space



are these interfaces integrated - an extension of the map?

Aggregating contributions

All the content (from social media, plays, and typed anecdotes) is aggregated; this invites members of the audience to consider where on the map all of this content might be located.

Physical proximity will be key, to encourage people who have typed an anecdote to position their contribution. Is this aggregation point integrated with the map?

This moment at the same time enables the discovery of other pieces of content, and the making of new connections.

This interface can also be used by the team to position content, such as that surrounding the Rude Mechanicals in the run-up to the festival.

The StoryMap

The StoryMap enables the positioning of all the content around a series of landmarks (locations of performances, Regent's Canal, Kingsland Rd...).

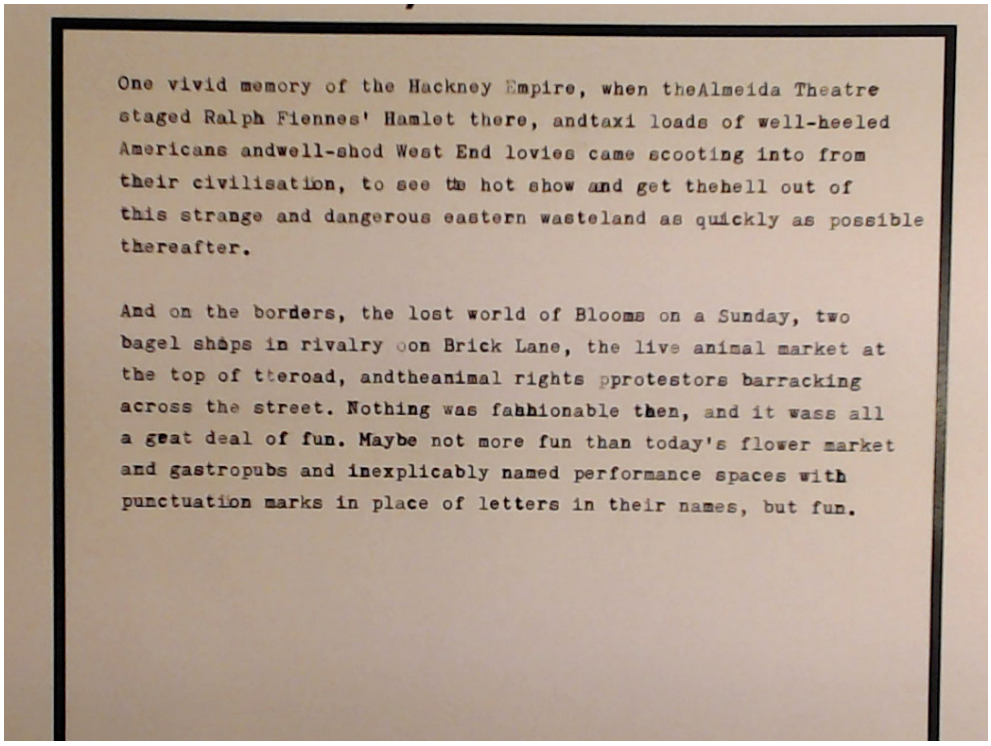
The 'map' is divided into an even grid (potentially with chess-board-like grid references). Content is assigned to this grid. If a tile is occupied, new content might be overlaid on top of previous pieces of content (the web interface offers the potential for lower layers to be viewed).

Content (while in hub) can be accessed using dials and etch-a-sketch style cursor, that leaves a trace, or 'journey' on the large map. A screen or other interface pulls-out / enlarges the content on a particular tile.

Fig. 61:
Project diagram
8 Mar 2016

Appendix 12: 'StoryMap' Contributions

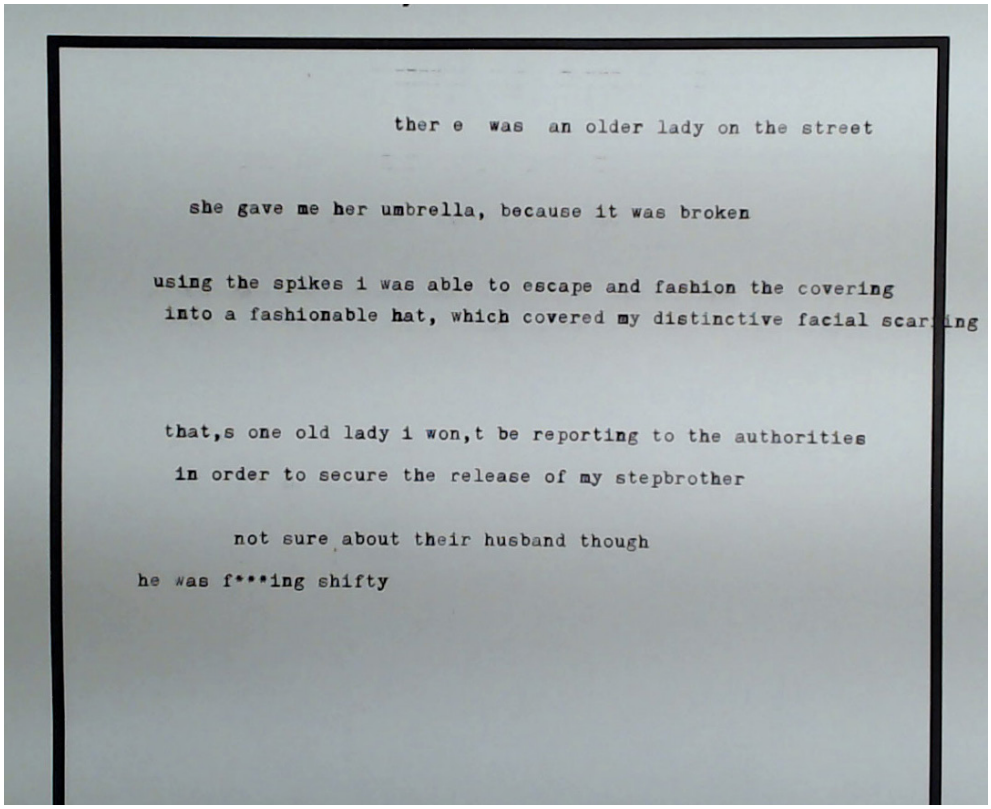
This section offers a selection of anecdotes shared by festival audience members by means of the 'StoryMap' platform. All contributions can be viewed through the online version of the map, available at http://storymap.benjaminkoslowski.com/shoreditch/ (accessed 3 Oct 2017).



One vivid memory of the Hackney Empire, when theAlmeida Theatre staged Ralph Fiennes' Hamlet there, andtaxi loads of well-heeled Americans andwell-shod West End lovies came scooting into from their civilisation, to see the hot show and get thehell out of this strange and dangerous eastern wasteland as quickly as possible thereafter.

And on the borders, the lost world of Blooms on a Sunday, two bagel shops in rivalry on Brick Lane, the live animal market at the top of theroad, andtheanimal rights protestors barracking across the street. Nothing was fashionable then, and it wass all a great deal of fun. Maybe not more fun than today's flower market and gastropubs and inexplicably named performance spaces with punctuation marks in place of letters in their names, but fun.

Fig. 62: Place-specific recollections shared through the 'StoryMap'



ther e was an older lady on the street

she gave me her umbrella, because it was broken

using the spikes i was able to escape and fashion the covering into a fashionable hat, which covered my distinctive facial scarring

that,s one old lady i won,t be reporting to the authorities in order to secure the release of my stepbrother

not sure about their husband though

he was f***ing shifty

Fig. 63: Fictionalised 'StoryMap' contribution

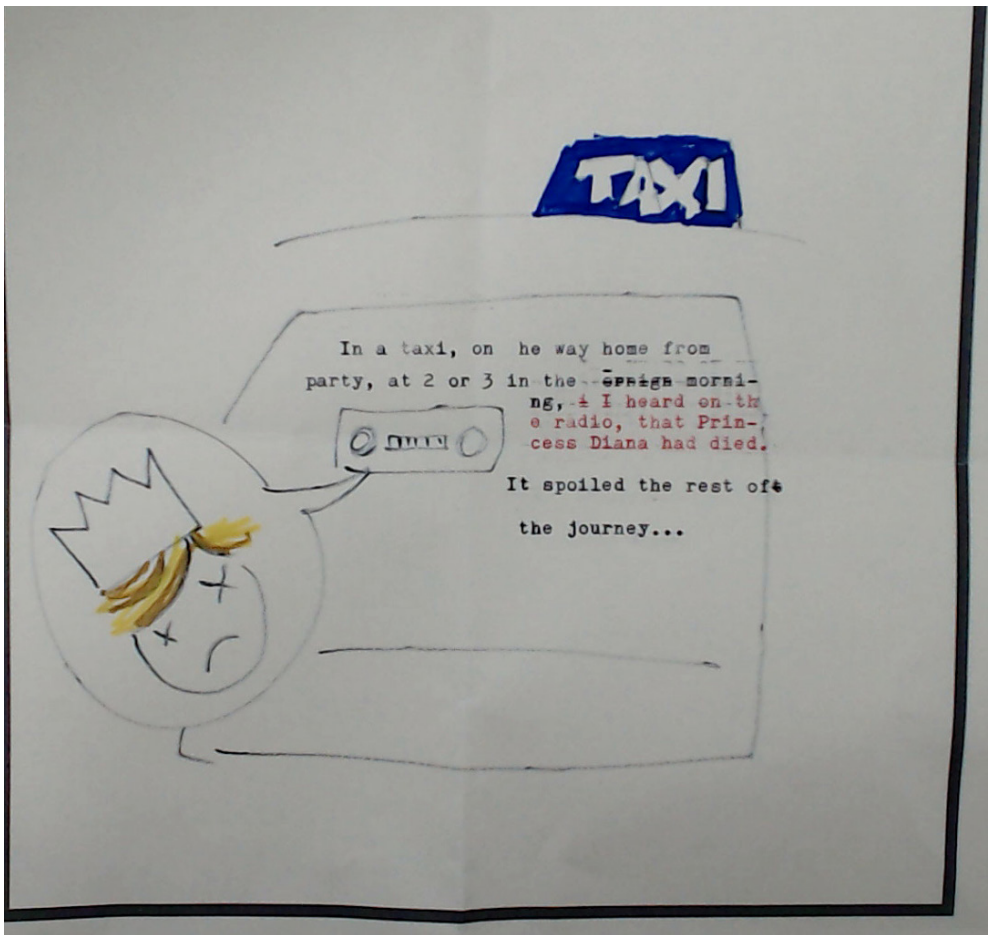


Fig. 64: Contribution augmented through drawing

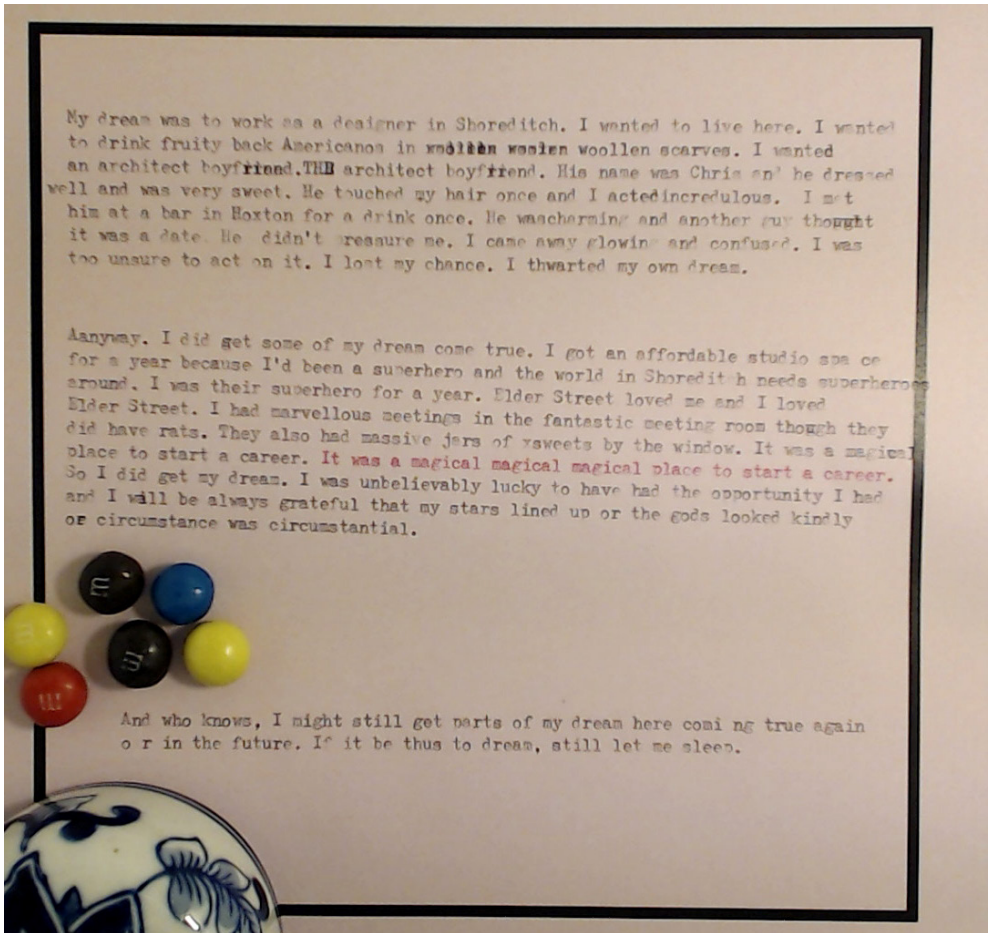


Fig. 65: Contributors added 'props' to anecdotes

Appendix 13: Workshops and Student Projects

A range of workshops and pedagogical situations have been useful in limiting the scope of research: while the initial impetus for research concerns the positioning of the individual online, I learnt through these that I firstly needed to identify ways in which I as a designer engage with the challenges of the digital, moving the 'designer-researcher' into focus in considering the 'individual' in digital contexts. Further, engagement with students from a range of backgrounds was helpful in positioning the contribution this research makes, as discussed in Chapter 6.

The early workshop at FACT Liverpool under the title 'The Digital Space Observatory' (see Appendix 4) and the 'Emotional Landscapes of Liverpool' workshop, discussed in Chapter 4.4.1 and Appendix 9, offered opportunities to engage with members of the public in conversations about digital interactions and well-being.

In addition to these opportunities to engage non-expert audiences in some of the questions emerging through the research, a range of student projects allowed me to test some of the emerging thinking with groups of young designers, both at undergraduate and post-graduate level. Going beyond conversations with the cohort of doctoral students within the CX and in the School of Communication, these projects present a more structured and output-driven approach to engaging designers in the subject-matter of the research. The projects highlighted challenges in engaging wider groups of designers in my own ways of approaching the central themes of my research, at points in the research, where these were still uncertain and themselves the object of investigation. At the same time, in helping to drive the research output, the projects have been of value in the context of this practice-led research: the framework of architectural representation presented here is aimed at rendering accessible to a wider audience of designers, such as those with whom I have worked in these student projects, the underlying principles of architectural representation and related methods that allow these to be put into practice.

An initial brief for a short project with Interior Architecture students at Middlesex University in October 2013 asked a group of second and third year undergraduate students to use model-making to spatially represent their social network and to explore the nature of their social relationships and interactions online; 'Map your Community / Model your Social Network' aimed at drawing out differences between immediate interaction and mediated interaction and to test conceptualisations of online social networks through physical making. While this project did not result in designed outputs yielding significant insights of value in the context of my own research, it was important in raising my own awareness of the challenges in engaging other spatial designers in considerations of digitally mediated interaction that make the connection with physical space and tangible objects.

Two workshops carried out at the Royal College of Art, as part of its interdisciplinary week-long 'AcrossRCA' programme, offered a more diverse audience: postgraduate students from a cross section of the college's departments included students from Global Innovation Design, Information Experience Design, Innovation Design Engineering, Textiles, Sculpture, Visual Communication, Curating Contemporary Art, Design Products, Service Design and Architecture.

The first 'AcrossRCA' workshop, 'Private Clouds, Public Good', was convened by fellow CX PhD researcher Ben Dalton and myself in October 2014, and encouraged students to interrogate conceptions of online personal data storage, considering aspects, such as individual control, the embodiment of data, and the tension between individual data and a collective body of data. The structure of the workshop foregrounded the role of 'objects' and 'systems' in exploring personal data and the ways it might be stored and accessed; the suggestion of personal data as a common good tapped into the thematic focus of the Creative Exchange on 'digital public space'. The group of sixteen students developed a range of approaches to re-conceptualising 'the cloud' and

to consider means of accessing personal data, from a private domestic space as a means of locating memories, to 'data candy-floss' as a means of information retrieval. As at other points throughout the course of the research, the limitations of architectural metaphors in trying to conceptualise the digital were highlighted through the outputs of the workshop: the use of the setting of a bedroom as a means of talking about personal information, for example, relies heavily on understandings of privacy emerging from the domestic interior, and might not transfer easily to considering degrees of public exposure. The workshop presents one of the early instances of engaging with other designers in the wider field in discussions of notions of privacy in online settings that has encouraged me – in conjunction with the review of literature in the field and my emerging design practice – to move the research away from the use of architecture as a metaphorical reference point, and instead towards a focus on design practice and its underlying principles.

The second 'AcrossRCA' workshop, 'MetaLondoners', conducted in October 2015 and run in collaboration with Dr Laura Ferrarello, a lecturer in IED at the RCA, and fellow doctoral researcher Jimmy Tidey, coincided with the development of the 'StoryMap' project. The workshop brief asked students to use Twitter to develop narratives that are situated between physical places – through tagging and geolocation data – and online spaces, where narratives appear in linear form. The week-long project provided a tight context to test principles and design methods emerging through my own doctoral research, and focused in particular on the method of mapping as a means of making sense of data, and as a means of encouraging students to unpick the relationship between digital data and physical places. The project brief was partially based on discussions around storytelling and location that had emerged throughout the development of the 'StoryMap' audience participation platform (Chapter 4.4.2); the workshop offered an opportunity for collaborator Tidey and me to reflect on the conversations that had developed through the

'StoryMap'. The focus on a geographical area, instead of architecture more specifically, as encouraged in previous projects, allowed participants to relate to a broader range of aspects of context to 'ground' digital information and interactions, rendering them tangible using both, narrative and place, and using social media to interrogate the relationship between place and the digital realm. Nevertheless, the short project again highlighted challenges in engaging with abstract digital data through the lens of physical space.

Another project brief, developed for undergraduate students on the 'Graphic and Digital Design' programme at the University of Greenwich in December 2016, helped again to foreground aspects of working through representation in spatial design practice, that are less intuitive within other design domains: the students' understanding of design-at-a-distance from the object of design, mediated by scale-representation, highlighted differences in processes of designing in communication design and architecture.

The six-week long project formed part of the 'Graphics-led Experience Design' module, undertaken by second year undergraduate students, and built on a previous design brief, in which students designed packaging for a music album of their choosing, exploring experiential and sensorial qualities of music; this next project asked students to spatially represent the essence and key qualities of a particular song from the album in a spatial intervention for a central London shop window. Under the title 'Spatialising Music', students developed a visual and spatial manifestation of narrative and qualities of the song, to be sited within the space of a shop window.

The students on the programme usually work directly with the object of design, for example packaging, or a poster. While these operate representationally, they simultaneously constitute the design outcome, rather than a representation to help generate it, as is typical in architectural practice. While it has to be recognised that, as second year students on an undergraduate programme, the students are still in the process of acquiring essen-

tial design skills, it is worth noting that several students struggled with the notion of designing the intervention at a remove from the site, represented by a scale-model. In some instances, the latter became the focus of the design process in itself, rather than a means of working by proxy: some students lacked an understanding of the scale-model as a representational device that communicates merely *some aspects* of the object of design that might be complemented by other modes of representation, such as visuals and diagrams, and instead treated the model as the final designed object.

While the student projects and workshops are not framed as a key part of the research discussed here, they have been useful in highlighting a range of challenges the research has had to deal with. In the early stages of the research, conversations with designers through student projects, members of the public through workshops, and fellow researchers through seminars and at conferences, highlighted the lack of a clear understanding of the relationship between architecture and digital spaces; this helped to shape the review of literature in the field. In addition to this, the student projects furthered the research in highlighting the lack of a coherent foundation for design to engage with the challenges of the digital, and serve as evidence thereof.

The observed challenges around conceptually engaging with scale-representation in design processes in the last student project were useful in articulating the framework of architectural representation emerging form the research presented here, and to identify what architectural practices of representation can bring to communication design.

8 LIST OF REFERENCES

Alexander, C., Ishikawa, S., & Silverstein, M. (1977). *A pattern language: Towns, buildings, construction*. New York: Oxford University Press.

Allen, J. (2000). On Georg Simmel: Proximity, distance and movement. In M. Crang, & N. Thrift (Eds.), *Thinking space* (pp. 54-70). London, New York: Routledge.

Allen, S. (2009). *Practice: Architecture technique + representation* (expanded 2. ed.). Abingdon: Routledge.

Angelidakis, A. (2010). Can architecture save us from facebook fatigue. In D. Hauptmann, & W. Neidich (Eds.), *In cognitive architecture: From biopolitics to noopolitics. architecture and mind in the age of communication and information* (pp. 284-301). Rotterdam: 010 Press.

Angelidakis, A. (2011, Mar 8). An abbreviated manifesto [blog post]. Retrieved from http://andreasangelidakis.blogspot.co.uk/2011/03/abbreviated-manifesto.html

Applin, S., Fischer, M., & Walker, K. (2012). Visualising PolySocial reality (revised). *Just-in-Time Sociology: Understanding Social Phenomena as they Unfold,* Retrieved from http://jitso.org/2012/12/03/visualising-polysocial-reality-revised/

Araujo, A., & Spankie, R. (2011). Modelling the domestic: Revisiting the doll's house. In E. Hollis, A. Milligan, F. Hay, D. Plunkett & J. Fleming (Eds.), *Interior tools interior tactics: Debates in interiors theory and practice* (pp. 149-158). Faringdon, Oxfordshire: Libri.

Attiwill, S. (2008). Exhibition as research. In L. Basso, I. Forino, G. Postiglione & F. Scullica (Eds.), *Places and themes of interiors contemporary research worldwide* (pp. 45-52). Milan: FrancoAngeli.

Augé, M. (2008). *Non-places* (J. Howe Trans.). London: Verso. (Original work published 1992)

Bachelard, G. (1994). *The poetics of space: The classic look at how we experience intimate places* (M. Jolas Trans.). Boston Mass.: Beacon Press. (Original work published 1958)

Ban cyberspace. (1997). *The Economist, 343*(8022), R12. Retrieved from http://www.economist.com/node/597446

Banham, R. (1972). Alternative networks for the alternative culture? In N. Cross (Ed.), *Design participation: Proceedings of the design research society's conference* (pp. 15-18). London: Academy Editions.

Bartlett, V., & Muller, L. (2017). Curating/containing: Exhibiting digital art about mental health. *ISEA2017: 16th International Image Festival,* Manizales. 279-288.

Baudrillard, J. (1988). In Lotringer S. (Ed.), *The ecstasy of communication* (B. Schutze, C. Schutze Trans.). Brooklyn N.Y.: Semiotext(e).

Baudrillard, J. (1994). *Simulacra and simulation* (S. F. Glaser Trans.). Ann Arbor: University of Michigan Press. (Original work published 1981).

Benjamin, W., & Lacis, A. (1978). Naples. In P. Demetz (Ed.), *Reflections : Essays, aphorisms, autobiographical writings* (E. Jephcott Trans.). (pp. 163-173). New York/London: Harcourt Brace Jovanovich.

Bernie, V. C. (2011). Field/work techniques. In S. Ewing, J. M. McGowan, C. Speed & V. C. Bernie (Eds.), *Architecture and field/work* (pp. 115-117). Abingdon: Routledge.

Blair, K. (2012). *Form and faith in victorian poetry and religion*. Oxford : Oxford University Press, 2012.

Borgdorff, H. (2011). The production of knowledge in artistic research. In M. Biggs, & H. Karlsson (Eds.), *The Routledge companion to research in the arts* (pp. 44-63). London: Routledge.
Borgdorff, H. (2012). *The conflict of the faculties: Perspectives on artistic research and academia*. (n.p.): Leiden University Press.
boyd, d. (2011). Social network sites as networked publics: Affordances, dynamics, and implications. In Z. Papacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites* (pp. 39-58). London: Routledge.
boyd, d. (2014). *It's complicated: The social lives of networked teens*. New Haven: Yale University Press.
boyd, d. m., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), 210-230. doi:10.1111/j.1083-6101.2007.00393.x
Branger_Briz. (2012). *A charge for privacy* [video]. Retrieved from https://vimeo.com/34575655
Colletti, M. (2010). Exuberance and digital virtuosity. *Architectural Design, 80*(2), 8-15. doi:10.1002/ad.1036
Colomina, B. (1992). The split wall: Domestic voyeurism. In B. Colomina (Ed.), *Sexuality & space* (pp. 73-130). Princeton: Princeton Papers on Architecture.
Colomina, B. (1996). *Privacy and publicity: Modern architecture as mass media*. Cambridge Mass., London: MIT Press.
Cook, P. (2008). *Drawing: The motive force of architecture*. Chichester: John Wiley & Sons.
Cooper, R. (2016). Design research - no boundaries. In G. Joost, K. Bredies, M. Christensen, F. Conradi & A. Unteidig (Eds.), *Design as research: Positions, arguments, perspectives* (pp. 131-136). Basel: Birkhäuser.
Coyne, R. (1995). *Designing information technology in the postmodern age: From method to metaphor*. Cambridge Mass., London: MIT Press.
Coyne, R. (2005). *Cornucopia limited : Design and dissent on the internet*. Cambridge Mass., London: MIT Press.
Coyne, R. (2010). *The tuning of place: Sociable spaces and pervasive digital media*. Cambridge Mass., London: MIT Press.
Coyne, R. (2016). *Mood and mobility : Navigating the emotional spaces of digital social networks*. Cambridge Mass.: MIT Press.
Cross, N. (1999). Design research: A disciplined conversation. *Design Issues, 15*(2), 5-10.
Cross, N. (2001). Designerly ways of knowing: Design discipline versus design science. *Design Issues, 17*(3), 49-55. doi:10.1162/074793601750357196
Cross, N. (2004). Expertise in design: An overview. *Design Studies, 25*(5), 427-441. doi:10.1016/j.destud.2004.06.002
Dade-Robertson, M. (2011). *The architecture of information: Architecture, interaction design and the patterning of digital information*. London: Routledge.
Dalton, B., Simmons, T., & Triggs, T. (2017). Knowledge exchange through the design PhD. In L. Vaughan (Ed.), *Practice-based design research* (pp. 65-76). London, New York: Bloomsbury Academic.
Davis, M. (2010). Maintaining the abstract critical facility in post-digital drawing practice. *Interstices, 11*, 82-91. Retrieved from http://interstices.aut.ac.nz/ijara/index.php/ijara/article/view/16
de Caters, A., Ferré, R., Colomina, B., Quignard, M., Esteve, P., Cifuentes, E. F., . . . Koolhaas, R. (2016). *1000m2 de deseo / 1000m2 of desire*. Barcelona: CCCB and Direcció de Comunicació de la Diputació de Barcelona.
De Cristofaro, E., & Murdoch, Steven J (Eds.). (2014). *Privacy enhancing technologies. 14th International Symposium, PETS 2014, Amsterdam. .* Cham: Springer.
Dercon, C. (2001). Speed-space. In J. Armitage (Ed.), *Virilio live: Selected interviews* (D. Miller Trans.). (pp. 69-81). London: Sage Publications.
Design Council. (2007). *Eleven lessons: Managing design in eleven global brands A study of the design process*. Retrieved from http://www.designcouncil.org.uk/resources/report/11-lessons-managing-design-global-brands

100 greatest toys. Devonshire, A. (Director). (2010). [TV documentary] Channel 4.
Dijck, v., José. (2013). *The culture of connectivity: A critical history of social media*. Oxford: Oxford University Press.
Dunne, A., & Raby, F. (2013). *Speculative everything: Design, fiction, and social dreaming*. Cambridge Mass.: MIT Press.
Emmons, P. (2007). Drawn to scale: The imaginative inhabitation of architectural drawings. In M. Frascari, J. Hale & B. Starkey (Eds.), *From models to drawings* (pp. 64-78). Abingdon: Routledge.
Emmons, P. (2011). Drawing sites : : Site drawings. In S. Ewing, J. M. McGowan, C. Speed & V. C. Bernie (Eds.), *Architecture and field/work* (pp. 119-128). London: Routledge.
Enserink, M., & Chin, G. (2015, Jan 30). The end of privacy. *Science, 347*, 490-491. doi:10.1126/science.347.6221.490
Erickson, T., & Kellogg, W. A. (2003). Social translucence: Using minimalist visualisations of social activity to support collective interaction. In K. Höök, D. Benyon & A. J. Munro (Eds.), *Designing information spaces: The social navigation approach. computer supported cooperative work* (pp. 17-41). London: Springer.
Evans, R. (1989). Architectural projection. In E. Blau, & E. Kaufman (Eds.), *Architecture and its image: Four centuries of representation. Works from the collection of the Canadian Centre for Architecture* (pp. 19-35). Montreal: Canadian Centre for Architecture Documents of Contemporary Architecture.
Evans, R. (1995). *The projective cast: Architecture and its three geometries*. Cambridge Mass.: MIT Press.
Evans, R. (1997). *Translations from drawing to building and other essays*. London: Architectural Association.
Ewenstein, B., & Whyte, J. (2009). Knowledge practices in design: The role of visual representations as epistemic objects. *Organization Studies, 30*(1), 7-30. doi:10.1177/0170840608083014
Feast, L., & Melles, G. (2010). Epistemological positions in design research: A brief review of the literature. *Connected 2010 – 2nd International Conference on Design Education,* Sydney.
Findeli, A., Brouillet, D., Martin, S., Moineau, C., & Tarrago, R. (2008). Research through design and transdisciplinarity: A tentative contribution to the methodology of design research. *Swiss Design Network Symposium 2008,* Mount Gurten, Berne, Switzerland. 67-94.
Floridi, L. (2014). *The fourth revolution: How the infosphere is reshaping human reality*. Oxford: Oxford University Press.
Flusser, V. (2002). In Ströhl A. (Ed.), *Writings* (E. Eisel Trans.). Minneapolis, Minn./ London: University of Minnesota Press.
Foucault, M. (1984). Of other spaces: Utopias and heterotopias. *Architecture / Mouvement/ Continuité,* Retrieved from http://web.mit.edu/allanmc/www/foucault1.pdf (Original work published March 1967)
Frankel, L., & Racine, M. (2010). The complex field of research: For design, through design, and about design. *DRS2010,* Montreal.
Frayling, C. (1993/4). Research in art and design. *Royal College of Art Research Papers, 1*(1), 1-5.
Friedberg, A. (2006). *The virtual window : From Alberti to Microsoft*. Cambridge Mass., London: MIT Press.
Friedman, K. (2003). Theory construction in design research: Criteria: Approaches, and methods. *Design Studies, 24*(6), 507-522. doi:10.1016/S0142-694X(03)00039-5
Friedman, K. (2008). Research into, by and for design. *Journal of Visual Arts Practice, 7*(2), 153-160. doi:10.1386/jvap.7.2.153/1
Fuchs, C. (2014). *Social media: A critical introduction*. London: SAGE.
Furtherfield Gallery. (2015). *Beyond the interface London*. Retrieved from http://www.furtherfield.org/gallery-files/BIL-PR-web.pdf
Gage, M. F. (2016). A hospice for parametricism. *Architectural Design, 86*(2), 128-133. doi:10.1002/ad.2034

Garcia, M. (2010). *The diagrams of architecture*. Chichester: Wiley.
Garner, S. (2008). Towards a critical discourse in drawing research. In S. Garner (Ed.), *Writing on drawing: Essays on drawing practice and research* (pp. 15-26). Bristol: Intellect Books.
Gaver, W. (2012). What should we expect from research through design? *CHI 2012,* Austin, Texas. 937-946. doi:10.1145/2207676.2208538
Giddens, A. (1990). *The consequences of modernity*. Cambridge: Polity in association with Blackwell.
Gill, V. (video journalist) (2015). Welcome to the designer asylum [video]. Retrieved from http://www.bbc.co.uk/news/av/health-32035911/welcome-to-the-designer-asylum
Goffman, E. (1966). *Behavior in public places: Notes of the social organization of gatherings*. New York: The Free Press.
Goffman, E. (1971). *The presentation of self in everyday life*. London: Penguin Books. (Original work published 1959)
Gough, T. (2016). Are we so sure it's not architecture? *Architecture and Culture, 4*(1), 9-29. doi:10.1080/20507828.2015.1089057
Grafe, C., & Bollerey, F. (2007). *Cafés and bars: The architecture of public display*. Abingdon: Routledge.
Greenaway, P. (1994). *The stairs: Geneva, the location.* London: Merrell Holberton.
Groat, L. N., & Wang, D. (2013). *Architectural research methods* (2nd ed.). Hoboken: Wiley.
Guldi, J. (n.d.). The spatial turn in architecture. [website] Retrieved from http://spatial.scholarslab.org/spatial-turn/the-spatial-turn-and-architecture/index.html
Hall, E. T. (1969). *The hidden dimension*. New York: Anchor Books.
Hamm, M. (2006). Reclaiming virtual and physical spaces: Indymedia London at the Halloween critical mass. *Open, 11*(Hybrid Space), 96-111.
Harries, K. (1982). Building and the terror of time. *Perspecta, 19*, 59-69.
Harries, K. (1998). *The ethical function of architecture*. Cambridge Mass., London: MIT Press.
Harvey, D. (1990). *The condition of postmodernity: An enquiry into the origins of culture change*. Oxford: Blackwell.
Hirst, P. (1993). Foucault and architecture. *AA Files,* (26), 52-60.
Hohenadel, K. (2015a). 11 modest designs that made the world a better place in 2015. Retrieved from http://www.slate.com/blogs/the_eye/2015/12/22/modest_designs_made_the_world_a_better_place_in_2015.html
Hohenadel, K. (2015b). This is what a psychiatric ward designed by patients looks like. Retrieved from http://www.slate.com/blogs/the_eye/2015/03/19/madlove_a_designer_asylum_from_james_leadbitter_the_vacuum_cleaner_is_a.html
Höök, K., Benyon, D., & Munro, A. J. (2003). *Designing information spaces: The social navigation approach*. London: Springer.
Hornecker, E. (2017). The tangible interaction framework. [website] Retrieved from http://www.ehornecker.de/TangiblesFramework.html
Hornecker, E., & Buur, J. (2006). Getting a grip on tangible interaction. *SIGCHI Conference on Human Factors in Computing Systems,* Montréal. 437-446. doi:10.1145/1124772.1124838
Jenkins, A. (2015). *Annie's 1000 plays*. (n.p.): Shakespeare in Shoreditch.
Johnson, J. H. (2011). *Venice incognito: Masks in the serene republic*. Berkeley, California; London: University of California Press.
Keen, A. (2012). *Digital vertigo: How today's online social revolution is dividing, diminishing, and disorienting us*. London: Constable.
Kholeif, O. (2016). *Electronic superhighway: From experiments in art and technology to art after the internet*. London: The Whitechapel Gallery.
Kivisto, P., & Pittman, D. (2013). Goffman's dramaturgical sociology: Personal sales and service in a commodified world. *Illuminating social life: Classical and contemporary theory revisited* (6th ed., pp. 297-318). Thousand Oaks, CA: SAGE Publications. doi:10.4135/9781506335483.n13

Kolarevic, B. (2003). *Architecture in the digital age: Design and manufacturing*. London: Spon.
Koolhaas, R., & McGetrick, B. (2004). *Content: Triumph of realization*. Köln: Taschen.
Koslowski, B. (2014). Screenscapes: Of theatre, audiences and social media. *International Festival of Art, New Media and Cybercultures,* Lisbon. 128-137.
Koslowski, B. (2015a). The house of lies: Dreamscapes, virtuality and (re)presentations of the subjective. In S. Haslam, & P. LeCouteur (Eds.), *Why would I lie? RCA research biennial 2015* (pp. 107-109). London: Royal College of Art.
Koslowski, B. (2015b). Mental health in a digital age: Lessons from architectural design practice. In V. Bartlett (Ed.), *Group therapy: Mental distress in a digital age [A user guide]* (pp. 104-111). Liverpool: Liverpool University Press.
Koslowski, B. (2016). The mediating city: Towards a mise-en-scène for interaction online. In M. Guaralda, E. M. Clift & A. Mattes (Eds.), *Filming the city: Urban documents, design practices and social criticism through the lens* (pp. 223-243). Bristol: Intellect Books.
Koslowski, B., & West, J. (2014). Workscapes for mental health: A creative approach to healthcare environments. *World Health Design: Architecture, Culture, Technology, 7*(4), 42-49.
Krämer, N. C., & Haferkamp, N. (2011). Online self-presentation: Balancing privacy concerns and impression construction on social networking sites. In S. Trepte, & L. Reinecke (Eds.), *Privacy online: Perspectives on privacy and self-disclosure in the social web* (pp. 127-141). Berlin, Heidelberg: Springer. doi:10.1007/978-3-642-21521-6_10
Lakoff, G., & Johnson, M. (1980). *Metaphors we live by*. Chicago ; London: University of Chicago Press.
Latham, J. R. (2017). Research methods framework. [website] Retrieved from http://johnlatham.me/frameworks/research-methods-framework/
Laurel, B. (2014). *Computers as theatre* (2nd ed.). Upper Saddle River, NJ: Addison-Wesley. (Original work published 1991)
Leach, N. (2009). Digital cities. *Architectural Design, 79*(4), 6-13. doi:10.1002/ad.911
Lind, M. (2010, Mar 11). The boring age. *Time,* Retrieved from http://content.time.com/time/specials/packages/article/0,28804,1971133_1971110_1971120,00.html
Liu, C. (2011). The wall, the window and the alcove: Visualizing privacy. *Surveillance & Society, 9*(1/2), 203-214.
Lovink, G. (2011). *Networks without a cause: A critique of social media*. Cambridge: Polity Press.
Lovink, G. (2015). What is the social in social media? *The internet does not exist* (pp. 162-183). Berlin: Sternberg Press.
Lucas, R. (2016). *Research methods for architecture*. London: Laurence King Publishing.
Lukasz Stanek. (2012). Architecture as space, again? Notes on the 'spatial turn'. *Le Journal Spéciale'Z, 4*, 48-53.
Lynch, K. (1960). *The image of the city*. Cambridge Mass., London: MIT Press.
Maglio, P. P., & Matlock, T. (2003). The conceptual structure of information space. In K. Höök, D. Benyon & A. J. Munro (Eds.), *Designing information spaces: The social navigation approach. computer supported cooperative work* (pp. 385-403). London: Springer.
Manovich, L. (2001). *The language of new media*. Cambridge Mass., London: MIT Press.
Massey, D. (2005). *For space*. Los Angeles: Sage.
Matlock, T., Castro, S. C., Fleming, M., Gann, T. M., & Maglio, P. P. (2014). Spatial metaphors of web use. *Spatial Cognition & Computation, 14*(4), 306-320. doi:10.1080/13875868.2014.945587
McArthur, J. A. (2016). *Digital proxemics: How technology shapes the ways we move*. New York: Peter Lang.
McArthur, J. A., & White, A. F. (2016a). Twitter chats as third places: Conceptualizing a digital gathering site. *Social Media + Society, 2*(3), 1-9. doi:10.1177/2056305116665857

McCullough, M. (2005). *Digital ground: Architecture, pervasive computing, and environmental knowing*. Cambridge Mass.: MIT Press.
McIntosh, P. (2010). *Action research and reflective practice: Creative and visual methods to facilitate reflection and learning*. London, New York: Routledge.
Mills, C. B. (2011). *Designing with models: A studio guide to architectural process models* (3rd ed.). Hoboken N.J., Chichester: Wiley.
Mims, C. (2017, Oct 22). How facebook's master algorithm powers the social network; the algorithm behind facebook's news feed, a "modular layered cake," extracts meaning from every post and photo. *Wall Street Journal Online,* Retrieved from https://www.wsj.com/articles/how-facebooks-master-algorithm-powers-the-social-network-1508673600
Morris, M. (2006). *Models : Architecture and the miniature*. Chichester: Wiley-Academy.
Morse, M. (1999). Body and screen. *Wide Angle, 21*(1), 63-75.
Mulvey, L. (1989). *Visual and other pleasures*. Basingstoke: Macmillan.
Myerson, J. (2015). Considering digital public space. *Symposium to Consider the Digital Public Space,* Digital Catapult, London. Retrieved from http://thecreativeexchange.org/sites/default/files considering_digital_public_space_by_jeremy_myerson.pdf
Myerson, J. (2016). Scaling down: Why designers need to reverse their thinking. *She Ji: The Journal of Design, Economics, and Innovation, 2*(4), 288-299. doi://doi.org/10.1016/j.sheji.2017.06.001
Negroponte, N. (1996). *Being digital*. New York: Vintage Books.
Nissenbaum, H. (2010). *Privacy in context: Technology, policy, and the integrity of social life*. Stanford, Calif.: Stanford Law Books.
Novak, M. (1991). Liquid architectures of cyberspace. In M. Benedikt (Ed.), *Cyberspace: First steps* (pp. 225-254). Cambridge Mass., London: MIT Press.
Palen, L., & Dourish, P. (2003). Unpacking "privacy" for a networked world. *SIGCHI Conference on human factors in computing systems*, Fort Lauderdale. 129-136. doi:10.1145/642611.642635
Pallasmaa, J. (1998). The space of time. *Oz, 20*, 54-57. doi:10.4148/2378-5853.1324
Pallasmaa, J. (2001). *The architecture of image: Existential space in cinema*. Helsinki: Rakennustieto oy Helsinki.
Pallasmaa, J. (2005). *The eyes of the skin: Architecture and the senses*. Chichester: Wiley-Academy.
Pallasmaa, J. (2011). *The embodied image: Imagination and imagery in architecture*. Chichester: Wiley.
Paolucci, P. (2003). Review: Designing information spaces: The social navigation approach. *Journal of Educational Technology & Society, 6*(4), 166-168.
Papacharissi, Z. (2009). The virtual geographies of social networks: A comparative analysis of facebook, LinkedIn and ASmallWorld. *New Media & Society, 11*(1-2), 199-220. doi:10.1177/1461444808099577
Papacharissi, Z. (2011). A networked self. In Z. Papacharissi (Ed.), *A networked self: Identity, community, and culture on social network sites* (pp. 304-318). London: Routledge.
Papacharissi, Z. (2012). Without you, I'm nothing: Performances of the self on twitter. *International Journal of Communication, 6*, 1989-2006.
Papacharissi, Z., & Gibson, P. L. (2011). Fifteen minutes of privacy: Privacy, sociality, and publicity on social network sites. In S. Trepte, & L. Reinecke (Eds.), *Privacy online: Perspectives on privacy and self-disclosure in the social web* (pp. 75-89). Berlin, Heidelberg: Springer Berlin Heidelberg. doi:10.1007/978-3-642-21521-6_7
Patternlanguage.com. (2017). [website] Retrieved from https://www.patternlanguage.com/
Perec, G. (1999). *Species of spaces and other pieces* (J. Sturrock Trans.). London: Penguin Books. (Original work published 1974)
Pérez-Gómez, A., & Pelletier, L. (2000). *Architectural representation and the perspective hinge*. Cambridge Mass., London: MIT Press.

Petherbridge, D. (2008). Nailing the liminal: The difficulties of defining drawing. In S. Garner (Ed.), *Writing on drawing: Essays on drawing practice and research* (pp. 27-41). Bristol: Intellect Books.
Picon, A. (2003). Architecture, science, technology and the virtual realm. In A. Picon, & A. Ponte (Eds.), *Architecture and the sciences: Exchanging metaphors* (pp. 292-313). New York: Princeton Architectural Press.
Picon, A., & Ponte, A. (Eds.). (2003). *Architecture and the sciences: Exchanging metaphors*. New York: Princeton Architectural Press.
Pope, A. (2014). *Ladders*. Houston Tex., New York: Rice University School of Architecture & Princeton Architectural Press. (Original work published 1996).
Prestinenza Puglisi, L. (2015). We are witnessing a mummification process. *Flaneur Magazine,* (4 - Rome), 26-27.
Rand, A. (2007). *The fountainhead*. London: Penguin Books. (Original work published 1943)
Rawes, P. (2007). Acts of imagination and reflection in architectural design. In M. Frascari, J. Hale & B. Starkey (Eds.), *From models to drawings* (pp. 261-269). Abingdon: Routledge.
Raymond Wacks. (2010). *Privacy: A very short introduction*. Oxford: Oxford University Press.
Reiser, J., & Umemoto, N. (2006). *Atlas of novel tectonics*. New York: Princeton Architectural Press.
Rendell, J. (2004). Architectural research and disciplinarity. *Arq: Architectural Research Quarterly, 8*(2), 141-147. doi:10.1017/S135913550400017X
Rendell, J. (2007). Some notes on architecture and design research. *RIBA Research Symposium 2007: Reflections on Practice: Capturing Innovation and Creativity*, 1-4.
Rendell, J. (2011). Afterword: Working (through) the field : /. In S. Ewing, M. McGowan, C. Speed & V. C. Bernie (Eds.), *Architecture and field/work* (pp. 172-177). London: Routledge.
Rendell, J. (2013). Working between and across: Some psychic dimensions of architecture's inter- and transdisciplinarity. *Architecture and Culture, 1*(1), 128-141. doi:10.2752/175145213X13756908698685
Robson, C. (2002). *Real world research: A resource for social scientists and practitioner-researchers* (2nd ed.). Oxford: Blackwell Publishing.
Rocker, I. M. (2006). When code matters. *Architectural Design, 76*(4), 16-25. doi:10.1002/ad.289
Ronson, J. (2015a). Jon Ronson: How the online hate mob set its sights on me. Retrieved from https://www.theguardian.com/media/2015/dec/20/social-media-twitter-online-shame
Ronson, J. (2015b). *So you've been publicly shamed*. London: Picador.
Roozenburg, N. F. M., & Dorst, K. (1998). Describing design as a reflective practice: Observations on Schön's theory of practice. In E. Frankenberger, H. Birkhofer & P. Badke-Schaub (Eds.), *Designers: The key to successful product development* (pp. 29-41). London: Springer London. doi:10.1007/978-1-4471-1268-6_3
Rourke, J. (Dir.). (2014). *Privacy: A new play by James Graham*. London: Donmar Warehouse.
Rust, C., Mottram, J., & Till, J. (2007). *AHRC research review practice-led research in art, design and architecture.* Retrieved from http://arts.brighton.ac.uk/__data/assets/pdf_file/0018/43065/Practice-Led_Review_Nov07.pdf
Sanders, E. B.-N. (2016). Where are we going? an aspirational map. In G. Joost, K. Bredies, M. Christensen, F. Conradi & A. Unteidig (Eds.), *Design as research: Positions, arguments, perspectives* (pp. 17-21). Basel: Birkhäuser.
Schodek, D. L., Bechthold, M., Griggs, K., Kao, K. M., & Steinberg, M. (2005). *Digital design and manufacturing: CAD/CAM applications in architecture and design*. Hoboken: John Wiley & Sons.
Schön, D. A. (1988). Designing: Rules, types and worlds. *Design Studies, 9*(3), 181-190.
Schön, D. A. (1991). *The reflective practitioner: How professionals think in action*. London: Ashgate. (Original work published 1983)

Schön, D. A. (1992). Designing as reflective conversation with the materials of a design situation. *Research in Engineering Design, 3*(3), 131-147. doi:10.1007/BF01580516
Schön, D. A., & Wiggins, G. (1992). Kinds of seeing and their functions in designing. *Design Studies, 13*(2), 135-156. doi:10.1016/0142-694X(92)90268-F
Schumacher, P. (2011). *The autopoiesis of architecture*. Chichester: Wiley.
Schumacher, P. (2016). Parametricism 2.0: Gearing up to impact the global built environment. *Architectural Design, 86*(2), 8-17. doi:10.1002/ad.2018
Schumacher, P. (2017). Tectonism in architecture, design and fashion: Innovations in digital fabrication as stylistic drivers. *Architectural Design, 87*(6), 106-113. doi:10.1002/ad.2245
Science Gallery Dublin. (2015). Secret: Nothing to see here. [website] Retrieved from http://dublin.sciencegallery.com/secret/
Scott, L. (2015). *The four-dimensional human: Ways of being in the digital world*. London: Windmill Books.
Secret. (n.d.). Dublin: Science Gallery Dublin.
Senior, T. J. (2016). *Connecting to innovate: A preliminary report on the achievements of the AHRC knowledge exchange hubs for the creative economy*. Bristol: UWE. Retrieved from http://www.creativeworkslondon.org.uk/wp-content/uploads/2016/07/Connecting-to-Innovate-Final.pdf
Simmel, G. (1969). The metropolis and mental life. In R. Sennett (Ed.), *Classic essays on the culture of cities* (H. H. Gerth, C Wright Mills Trans.). (pp. 47-60). Englewood Cliffs, N.J: Prentice-Hall. (Original work published 1903)
Sinclair, M. (2016, Apr). Madlove: A designer asylum. *Creative Review, 36*, 54-57.
Sky Arts Ignition: Memory Palace. (2013). About the exhibition. [website] Retrieved from http://www.vam.ac.uk/content/exhibitions/exhibition-sky-arts-ignition-memory-palace/about-the-exhibition/
Smith, A. C. (2004). *Architectural model as machine : A new view of models from antiquity to the present day*. Oxford: Architectural Press.
Soja, E. W. (1989). *Postmodern geographies: The reassertion of space in critical social theory*. London, New York: Verso.
Solove, D. J. (2009). *Understanding privacy*. Cambridge Mass., London: Harvard University Press.
Spiller, N. (Ed.). (2002). *Cyber_reader*. London; New York: Phaidon.
Stevenson, A. (Ed.). (2010). *Oxford dictionary of english* (3rd ed.). Oxford: Oxford University Press.
Stewart, S. (1993). *On longing: Narratives of the miniature, the gigantic, the souvenir, the collection*. Durham, London: Duke University Press.
Stirling, E. (2016). 'I'm always on facebook!': Exploring facebook as a mainstream research tool and ethnographic site. In H. Snee, C. Hine, S. Roberts, Y. Morey & H. Watson (Eds.), *Digital methods for social science : An interdisciplinary guide to research innovation* (pp. 51-66). London: Palgrave Macmillan. doi:10.1057/9781137453662
Stirling, E. (2017). Crafting ethnographic experiences: Ways of knowing facebook - influences of a practice-based approach on research on everyday digital life. *Cumulus Hong Kong 2016,* Hong Kong.
Stoppani, T. (2007). Translucent and fluid: Piranesi's impossible plan. In M. Frascari, J. Hale & B. Starkey (Eds.), *From models to drawings* (pp. 99-108). Abingdon: Routledge.
StoryMap Liverpool. (2016). Retrieved from http://storymap.benjaminkoslowski.com/liverpool/
StoryMap Shoreditch. (2016). Retrieved from http://storymap.benjaminkoslowski.com/shoreditch/
Tadeo, M. (2014, Jan 27). Anton casey fired and flees singapore in economy class over "poor people" comments. *The Independent*, Retrieved from http://www.independent.co.uk/news/business/news/anton-casey-fired-and-flees-singapore-in-economy-class-over-poor-people-comments-9088199.html#
Tally Jr., R. T. (2013). *Spatiality*. London, New York: Routledge.

Thackara, J. (2005). *In the bubble : Designing in a complex world*. Cambridge Mass., London: MIT Press.
The Creative Exchange. (2015). *The Creative Exchange final report to the AHRC.* Retrieved from http://thecreativeexchange.org/#/outcomes
Trepte, S., & Reinecke, L. (2011). The social web as a shelter for privacy and authentic living. In S. Trepte, & L. Reinecke (Eds.), *Privacy online: Perspectives on privacy and self-disclosure in the social web* (pp. 61-73). Berlin, Heidelberg: Springer Berlin Heidelberg. doi:10.1007/978-3-642-21521-6_6
Triggs, T. (2015). Research notes: Communication design. *Communication Design, 3*(1), 1-5. doi:10.1080/20557132.2015.1085675
Troiani, I., & Ewing, S. (2014). Inside architecture from the outside: Architecture's disciplinary practices. *Architecture and Culture, 2*(2), 151-166. doi:10.2752/205078214X14030010182308
Tschumi, B. (1994). *The Manhattan transcripts*. London: Academy Editions. (Original work published 1981).
Tschumi, B. (1996). *Architecture and disjunction*. Cambridge Mass., London: MIT Press.
Tschumi, B. (2014). In Migayrou F. (Ed.), *Architecture: Concept & notation*. Paris: Centre Pompidou.
Tsjeng, Z. (2014, Oct 3). Artist causes outrage with public broadcast of Grindr PMs. *Dazed Digital*, Retrieved from http://www.dazeddigital.com/artsandculture/article/22063/1/artist-causes-outrage-with-public-broadcast-of-grindr-pms
Tuan, T. (1977). *Space and place: The perspective of experience*. Minneapolis Minn., London: University of Minnesota Press.
Turkle, S. (1997). *Life on the screen*. London: Phoenix.
van Schaik, L. (2008). *Spatial intelligence: New futures for architecture*. Hoboken N.J., Chichester: Wiley.
van Schaik, L. (2014). How can code be used to address spatiality in architecture? *Architectural Design, 84*(5), 136-141. doi:10.1002/ad.1820
Venturi, R., Scott Brown, D., & Izenour, S. (1977). *Learning from las vegas: The forgotten symbolism of architectural form* (revised ed.). Cambridge Mass., London: MIT Press.
Verhoeven, D. (n.d.). Wanna play? Retrieved from http://driesverhoeven.com/en/project/wanna-play/
Vidler, A. (2000). Diagrams of diagrams: Architectural abstraction and modern representation. *Representations,* (72), 1-20. doi:10.2307/2902906
Vidler, A. (2001). *Warped space: Art, architecture, and anxiety in modern culture*. Cambridge Mass., London: MIT Press.
Dogville. von Trier, L. (Director). (2003). [Video/DVD] Netherlands/Denmark/UK/France/Finland/Sweden/Germany/Italy/Norway: Zentropa Entertainments.
Whyte, W. H. (1988). The social life of small urban spaces [video]. Retrieved from https://archive.org/details/SmallUrbanSpaces
Wiberg, M. (2015, Mar). Interaction design meets architectural thinking. *Interactions, 22*, 60-63. doi:10.1145/2732936
Workshop: Digital Space Observatory. (2014) Retrieved from http://www.fact.co.uk/whats-on/archive/w/workshop-digital-space-observatory.aspx
Yates, F. A. (2014). *The art of memory*. London: The Bodley Head. (Original work published 1966)
Yee, J. S. R. (2010). Methodological innovation in practice-based design doctorates. *Journal of Research Practice, 6*(2)
Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). London: SAGE.

9 SELECT BIBLIOGRAPHY

Alavi, H., Churchill, E., Kirk, D., Nembrini, J., & Lalanne, D. (2016, Oct 26). Deconstructing human-building interaction. *Interactions, 23*, 60-62. doi:10.1145/2991897

Alex Seago, & Anthony Dunne. (1996). New methodologies in art and design research: The object as discourse. *Royal College of Art Research Papers, 2*(1), 1-5.

Archer, B. (1995). The nature of research. *Co-Design, Interdisciplinary Journal of Design,*6-13.

Aston, E., & Savona, G. (1991). *Theatre as sign-system: A semiotics of text and performance*. London: Routledge.

Beckmann, J. (Ed.). (1998). *The virtual dimension: Architecture, representation and crash culture*. New York: Princeton Architectural Press.

Beinart, K. (2014). Becoming and disappearing: Between art, architecture and research. *Arts and Humanities in Higher Education, 13*(3), 227-234. doi:10.1177/1474022213514557

Brin, D. (1996). The transparent society. *Wired.* Retrieved from http://archive.wired.com/wired/archive/4.12/fftransparent.html

Cairns, G. (2013). *The architecture of the screen: Essays in cinematographic space*. Bristol, Chicago: University of Chicago Press.

Cartwright, W. (2009). Applying the theatre metaphor to integrated media for depicting geography. *Cartographic Journal, The, 46*(1), 24-35. doi:10.1179/000870409X415561

Chapman, M., Ostwald, M. J., & Tucker, C. (2004). Semiotics, interpretation and political resistance in architecture. *The 38th International Conference of Architectural Science Association ANZAScA,* Launceston, Tasmania.

Cline, E. (2011). *Ready player one*. New York: Crown.

Coyne, R. (1999). *Technoromanticism : Digital narrative, holism, and the romance of the real*. Cambridge, Mass.: MIT Press.

Coyne, R., Rosenman, M. A., Radford, A. D., Balachandran, M., & Gero, J. S. (1990). *Knowledge-based design systems*. Reading Mass.: Addison-Wesley.

Coyne, R., & Snodgrass, A. (2006). *Interpretation in architecture: Design as a way of thinking*. London: Routledge.

de Certeau, M. (1984). *The practice of everyday life* (S. Rendall Trans.). Berkeley, Los Angeles, London: University of California Press.

Debord, G. (1983). *Society of the spectacle*. Detroit: Black & Red. (Original work published 1967)

Douglas, A., Gray, C., & Scopa, K. (2000). Research through practice: Positioning the practitioner as researcher. *Working Papers in Art and Design, 1*

Dyson, F. (1998). "Space," "Being," and other fictions in the domain of the virtual. In J. Beckmann (Ed.), *The virtual dimension: Architecture, representation, and crash culture* (pp. 26-45). New York: Princeton Architectural Press.

Eco, U. (1987). *Travels in hyperreality: Essays* (W. Weaver Trans.). London: Picador.

Eco, U. (1997). Function and sign: Semiotics of architecture. In N. Leach (Ed.), *Rethinking architecture: A reader in cultural theory* (pp. 173-193). London, New York: Routledge.

Elden, S. (2007). There is a politics of space because space is political: Henri lefebvre and the production of space. *Radical Philosophy Review, 10*(2), 101–116.

Forty, A. (2004). *Words and buildings: A vocabulary of modern architecture*. London: Thames & Hudson.

Friedman, K. (2016). New challenges for design. *She Ji: The Journal of Design, Economics, and Innovation, 2*(4), 271-274. doi://doi.org/10.1016/j.sheji.2017.07.001
Fuchs, C. (2007). Transnational space and the 'network society'. *Twenty-First Century Society, 2*(1), 49-78. doi:10.1080/17450140601101218
Gaines, E. (2006). Communication and the semiotics of space. *Journal of Creative Communications, 1*(2), 173-181. doi:10.1177/097325860600100203
Gerbaudo, P. (2012). *Tweets and the streets: Social media and contemporary activism*. London: Pluto Press.
Gibson, W. (1995). *Neuromancer*. London: Harper Collins. (Original work published 1984)
Gillette, F. (2013). Snapchat and the erasable future of social media. Retrieved from http://www.businessweek.com/articles/2013-02-07/snapchat-and-the-erasable-future-of-social-media#p1
Golding, C. (2017). Advice for writing a thesis (based on what examiners do). *Open Review of Educational Research, 4*(1), 46-60. doi:10.1080/23265507.2017.1300862
Gürses, S., & Diaz, C. (2013). Two tales of privacy in online social networks. *IEEE Security & Privacy, 11*(3), 29-37. doi:10.1109/MSP.2013.47
Hatleskog, E. K. (2014). Reflection, participation and production of ideas through architectural design practice. *Reflective Practice, 15*(2), 144-159. doi:10.1080/14623943.2014.883309
Hollis, E. (2013). The interior: Television, gaming and new media. In L. Weinthal, & G. Brooker (Eds.), *The handbook of interior architecture and design* (pp. 213-225). London: Bloomsbury.
Hubbard, P. (2012). *Thinking spaces, differently?* London, England: SAGE Publications. doi:10.1177/2043820611434863
Jacobs, J. (1992). *The death and life of great american cities*. New York: Vintage Books. (Original work published 1961)
Jacobs, S. (2011). The architecture of the gaze: Jeffries's apartment and courtyard. In L. Weinthal (Ed.), *Toward a new interior: An anthology in interior design theory* (pp. 546-558). Princeton: Princeton Architectural Press.
Kaminer, T., & Stanek, L. (2007). Trans-disciplinarity: The singularities and multiplicities of architecture. *Footprint,* (1), 1-5.
Kaur, P. (2011). Designing user centric online privacy. *Aalto University, Seminar on Network Security,*
Koolhaas, R. (1994). *Delirious New York*. New York: Monacelli Press.
Kress, G. (2006). 'Screen': Metaphors of display, partition, concealment and defence. *Visual Communication, 5*(2), 199-204. doi:10.1177/1470357206065335
Lefebvre, H. (1991). *The production of space* (D. Nicholson-Smith Trans.). Oxford: Blackwell.
Leung, L., & Waters, M. (2009). Architectures of the physical and virtual: Parallel design principles in built and digital environments. In L. Leung (Ed.), *Digital experience design: Ideas, industries, interaction* (pp. 93-99). Bristol; Chicago: Intellect.
Linzey, M. (2010). Architectural drawings do not represent. *Interstices, 11*, 31-39. Retrieved from http://interstices.aut.ac.nz/ijara/index.php/ijara/article/viewFile/10/70
Lister, M. (2005). Dangerous metaphors and meaning in immersive media. In J. Furby, & K. Randell (Eds.), *Screen methods: Comparative readings in film studies* (pp. 38-47). London: Wallflower.
Luck, R. (2012). 'Doing designing': On the practical analysis of design in practice. *Design Studies, 33*(6), 521-529. doi:10.1016/j.destud.2012.11.002
Luck, R. (2014). Seeing architecture in action: Designing, evoking, and depicting space and form in embodied interaction. *International Journal of Design Creativity and Innovation, 2*(3), 165-181. doi:10.1080/21650349.2013.875488
Machon, J. (2013). *Immersive theatres: Intimacy and immediacy in contemporary performance*. London, New York: Palgrave Macmillan.

Maki, F. (2008). In Mulligan M. (Ed.), *Nurturing dreams: Collected essays on architecture and the city*. Cambridge Mass., London: MIT Press.
Manovich, L. (2006). The poetics of augmented space. *Visual Communication, 5*(2), 219-240. doi:10.1177/1470357206065527
Mansell, R. (2012). *Imagining the internet: Communication, innovation, and governance*. Oxford: Oxford University Press.
Mayo, J. M. (2009). Introduction: Time and landscape. *Journal of Architectural and Planning Research, 26*(2), 91-94.
Mitchell, W. J. (1996). *City of bits: Space, place and the infobahn*. Cambridge Mass., London: MIT Press.
Mitchell, W. J. (2000). *E-topia: Urban life, jim - but not as we know it*. Cambridge Mass., London: MIT Press.
Mitchell, W. J. (2005). *Placing words: Symbols, space, and the city*. Cambridge Mass., London: MIT Press.
Moggridge, B. (2006). *Designing interactions*. Cambridge Mass., London: MIT Press.
Muller, L. (2011). Learning from experience – A reflective curatorial practice. In E. Edmonds, & L. Candy (Eds.), *Interacting: Art, research and the creative practitioner* (pp. 94-106). Faringdon, Oxfordshire: Libri.
Murrani, S. (2011). *Unstable territories of representation: Architectural experience and the behaviour of forms, spaces and the collective dynamic environment.* [Unpublished PhD thesis] Retrieved from https://pearl.plymouth.ac.uk/handle/10026.1/310?show=full
Niedderer, K., & Roworth-Stokes, S. (2007). The role and use of creative practice in research and its contribution to knowledge. *IASDR07,* Hong Kong Polytechnic University.
Payne, S. R., Mackrill, J., Cain, R., Strelitz, J., & Gate, L. (2015). Developing interior design briefs for health-care and well-being centres through public participation. *Architectural Engineering and Design Management, 11*(4), 264-279. doi:10.1080/17452007.2014.923288
Press, M. (2016). The resourceful social expert: Defining the future craft of design research. In G. Joost, K. Bredies, M. Christensen, F. Conradi & A. Unteidig (Eds.), *Design as research: Positions, arguments, perspectives* (pp. 22-27). Basel: Birkhäuser.
Rattenbury, K. (Ed.). (2002). *This is not architecture: Media constructions*. London: Routledge.
Rodgers, P., & Bremner, C. (2013). Exhausting discipline: Undisciplined and irresponsible design. *Architecture and Culture, 1*(1), 142-161. doi:10.2752/175145213X13756908698720
Rodgers, P., & Winton, E. (2010). Design thinking – A critical analysis. *12th International Conference on Engineering and Product Design Education, Norwegian University of Science and Technology,* Trondheim, Norway.
Sanders, E.-B. & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign, 4*(1), 5-18. doi:10.1080/15710880701875068
Seago, A. (1997). In Dunne A., Royal College of Art (Great Britain) (Eds.), *New methodologies in art and design research : The object as discourse* Royal College of Art, 1997.
Seago, A., & Dunne, A. (1997). New methodologies in art and design research: The object as discourse. *Royal College of Art Research Papers, 2*(1), 1-5.
Smyth, M. (2010). *Digital blur: Creative practice at the boundaries of architecture, design and art*. Faringdon, Oxfordshire: Libri Publishing.
Stanek, Ł. (2011). *Henri Lefebvre on space: Architecture, urban research, and the production of theory*. Minneapolis, Minn.: Univ. of Minnesota Press.
Taylor, M. (2000). Polly pocket: Domesticity, popular culture and the interior. In W. Busfield, & P. Richards (Eds.), *1997-1998 CHASA refereed design scheme* (pp. 41-47). Nedlands: University of Western Australia.
Troiani, I., Ewing, S., & Periton, D. (2013). Architecture and culture: Architecture's disciplinarity. *Architecture and Culture, 1*(1), 6-19. doi:10.2752/175145213X13760412749917

Tschumi, B. (2014). *Notations: Diagrams and sequences*. London: Artifice.
Turnbull, D., & Connell, M. (2011). Prototyping places: The museum. In E. Edmonds, & L. Candy (Eds.), *Interacting: Art, research and the creative practitioner* (pp. 79-93). Faringdon: Libri.
Turner, S. (1994). Improving the content and utility of design briefs. *Planning Practice & Research, 9*(3), 289-310. doi:10.1080/02697459408722935
Ullmer, B., & Ishii, H. (2000). Emerging frameworks for tangible user interfaces. *IBM Systems Journal, 39*(3/4), 915-931. doi:10.1147/sj.393.0915
Ursprung, P. (Ed.). (2002). *Herzog & de Meuron: Natural history* (F. Elliott, C Schelbert & N Saulter Trans.). Montréal: Canadian Centre for Architecture.
Visser, W. (2010). Schön: Design as a reflective practice. *Collection,* (2), 21-25.
Wacks, R. (2010). *Privacy: A very short introduction*. Oxford, New York: Oxford University Press.
Walther, J. B. (2011). Introduction to privacy online. In S. Trepte, & L. Reinecke (Eds.), *Privacy online: Perspectives on privacy and self-disclosure in the social web* (pp. 3-8). Berlin, Heidelberg: Springer Berlin Heidelberg. doi:10.1007/978-3-642-21521-6_1
Westin, A. F. (1970). *Privacy and freedom*. London, Sydney, Toronto: The Bodley Head.
White, G. (2013). *Audience participation in theatre: Aesthetics of the invitation*. London, New York: Palgrave Macmillan.

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