



The perception and fears of sharing personal digital data in digital public space

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Authorship declaration

I hereby declare that:

This thesis is the result of my own work and includes nothing, which is the outcome of work done in collaboration except where specifically indicated in the text and bibliography.

This thesis is not substantially the same as any that I have submitted, or that is being concurrently submitted, for a degree or diploma or other qualification at Lancaster University or any other University or similar institution.

That my thesis does not exceed the length prescribed in the regulations of the PhD examination for which I am a candidate.

I have read, and adhered to, the University's policy on plagiarism.

The length of my dissertation is: 80,168 (including quotes and appendices).

Signed:

Date:

The perception and fears of sharing personal digital data in digital public space

Abstract

This thesis provides a critical and practice based investigation of personal fears of sharing personal digital data. In it, I explore the fears and growing tensions between the requirements to share personal information while maintaining the need to control and protect personal privacy. The emphasis of this study was to develop research through a series of multi-disciplinary, practice-based projects alongside external industry partners.

I begin by exploring the rise in surveillance methods, from the Panopticon to the rise of social network sites and examine the consequences of sharing personal information online. Data sharing has been made easier through the proliferation of internet connected, mobile devices and wearable technologies that has led to a growing reciprocal trade in personal information in return for online services. In a world of 'digital narcissism' and perpetual life-logging brought about by the volume of shared data, modern surveillance is an increasingly manifestation of consumer activity. However, since the Snowden revelations in 2013 which revealed the National Security Agency (NSA) was spying on US citizens, the consequence of sharing personal information has led to a proliferation of leaks, thefts, and growing anxieties amongst the public, resulting in a greater awareness of privacy concerns and wariness about divulging personal information.

My research focused upon those that obstruct, withhold information, and avoid contributing to sharing personal data. Therefore, my research was designed to identify the strategies available to designers working with shared data to combat fears of data surveillance and exploitation. The outcome of my research has shown, through a series of case studies, how individuals perceive the physical environment and the proximity to their data, and how data will be shared.

My research was part of the innovative Creative Exchange programme, one of four Doctoral Training Centre knowledge exchange hubs funded by the Arts and Humanities Research Council. The aim was to develop research using multidisciplinary, practice based research projects alongside external industry partners, utilising a variety of research methods and co-design approaches to investigate concepts around the emergent subject of digital public space.

Dedication

This PhD thesis is dedicated to my partner Posie. Thank you for your patience, understanding, and encouragement during the past 4 years. I could not have achieved this without you.

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1 Introduction

In 2009, I took part in an exhibition at Manchester's Cornerhouse Gallery during which I became aware of the level of fear relating to the sharing of personal data. I had previously worked on developing a series of artworks that combined both technology and photography, to explore the nature of hidden data. The aim of the exhibition in Manchester, entitled *POI: Moving, Mapping, Memory*, was to 'investigate our shifting existences, both physical and digital, and the ways we perceive, shape and interweave the environments we inhabit.' (The Cornerhouse, 2009). The artwork I designed, *Ubiquitous Interactivity*, used radio frequency identification (RFID) card technology to generate images based on hidden card data. RFID is based upon a contactless chip, that uses electromagnetic fields to power it, read the data from it, and to use the number to identify or track its movements. At that time RFID was becoming commonplace for public transport, such as the Oyster card on the London Underground, for financial transactions using contactless credit and debit cards. In 2006, this technology had subsequently been introduced into all British passports, known as biometric passports, or e-passport.

The design of my exhibition was to demonstrate how the visualisation of hidden information could make it less threatening. I created the reader, built with an Arduino microcontroller¹, to control additional electronics linked to a personal computer and a screen to display the output. Passing an RFID card across the reader sent the signal from the microcontroller back to the personal computer, which

¹ Arduino is an open-source electronics platform based on easy-to-use hardware and software. It is intended for anyone making interactive projects. (www.arduino.cc)

generated a unique image based upon the hidden values stored on the chip. The British biometric passport spawned a new number each time it was used which I found useful to demonstrate how the system worked. As I passed my newly acquired passport across the reader, it created a newly constructed image that was displayed on the gallery wall. During the private view, an irate individual approached me. He was not only angry that I was able to read the passport chip, but was irritated that when he had to order a new passport it would conceal an RFID microchip. In conversation, he argued that he would be requesting a passport without a chip and, when I stated that this was not negotiable and all new passports would contain RFID, he was adamant he would object. The events at the time of the exhibition coincided with the proposed trial of an identity card around the Greater Manchester area. The identity card debate divided opinions and the trial was later scrapped. However, the concept of storing personal data on a card created a fear of the unknown for many people.

1.1 Context

The passport incident at the gallery led me to consider how fear of data sharing is an evolving concern, not only restricted to the passport data, but all personal data that is digital and shared online. My investigation into personal fears of data sharing has led me to investigate and reveal a complex relationship between personal data, privacy, trust, ownership, control, and the reciprocal trade in personal information.

My research interest addresses the fears of sharing personal data. The significance of this research affects everyone who exchanges information online. This not only has implications for what you choose to disclose about yourself, personal repercussions

also include what others say or disclose about you. This is exacerbated by the growing trend to the self-disclosure of personal information, which has created a growing tension between the appeals to share personal information with the need to protect individual privacy. While studies have shown that users acknowledge the reciprocal trade in personal information, there are growing accounts of a loss of personal control over private information. In extreme cases, the threat to personal privacy has led individuals to withdraw from the online world, a last resort in protecting personal privacy. In order to understand how fears of data sharing occur, my research investigates fear of data sharing through a series of practice-based projects.

1.2 Background

The background to this study relates to the ever-shifting position in which people exist in both a digital and physical world. The technological shift from the infancy of the internet, which was reliant upon static web pages (defined as web 1.0), later migrated to a more user focused space (web 2.0) that is prevalent today. By tracing the swing from a passive to an interactive space, I will demonstrate how the implications for personal data sharing to be misused have increased exponentially as the reliance on digital information increases.

1.3 Online anonymity

As early as 1993, the anonymity of the web was emphasised by the famous illustration in the New Yorker by Peter Steiner that highlighted the image of a dog at the desk of a computer with the caption below, 'On the internet, nobody knows you are a dog' (Steiner, 1993, p.14). This reinforced the anonymity of individual profiles

that allowed people to express themselves in a number of ways, while occupying multiple identities, when participating within a global online community.



Figure 1. Peter Steiner, *The New Yorker* (1993)

In 1996, the vision of the digital future was 'anti-spatial' (Mitchell 1996) allowing everyone to live and work anywhere. In the anti-spatial virtual city the old parameters and rules had gone; the streets, quarters and squares that once defined the use of the city had been reconfigured and adjusted to a new online space. The freedom of the online presence with the rise of the online communities meant that while the rules of space had changed so had the relationship with the self. Anonymity allowed anyone anywhere to become free of the physical boundaries that defined him or her and gave way to the element of play. The early

days of the digital space could be likened to the attributes of a playground, giving rise to the possibilities of dressing-up, role-play, creating new identities, and acting out fantasies within the confines of an online world.

Digital technology has created the ability to interact globally in real-time, transforming the concept of locality; and yet, at the same time, it has created new anxieties and fears about how to control personal privacy (Baym 2010; Morley 2010). Just as television 'transcends the division of the public and private as to make it unnecessary to actually go anywhere any more' (Morley 2010, p.4); digital space became mobile, transforming the understanding of the physical space. McCarthy uses the term 'slipperiness' to suggest that television cannot be considered the same technological object of a private environment, as soon as television entered the public sphere it became a 'media object in social space' (McCarthy 2001, p. 3). The technology of the internet metamorphosed in the same way, as ownership and control affected an understanding of communication within a digital public space (Morley 2010; McCarthy 2001).

By 1999, the emergence of the term Web 2.0, highlighted a shift in emphasis toward user-generated content from static content, and systems migrated to a user-defined environment. The arrival of MySpace in 2003, alongside other social networking such as Facebook (2004) and Twitter (2006) moved the emphasis away from anonymity to an environment of personal engagement and immediacy. Coupled with the introduction of the iPhone in 2007, this created a platform of instant mobile communication and a system for consensual surveillance. The illustration below

(How the hell does Facebook know I'm a dog, Cottingham, p.16) mimics the Peter Steiner cartoon from 1993 and reinforces the current mindset that replaces the anonymity that nobody knows who you are online, to the situation today in which social networks know exactly who you are.



How the hell does Facebook know I'm a dog?

Figure 2. Rob Cottingham Illustration, (Date unknown) (robcottingham.ca)

The disappearance of having an anonymous secondary identity can be identified as the result of the rise of the quantified self within social networks, coupled with locative media that tracks and traces individuals. The drive to identify individuals has been established by commercial enterprises, which utilise tracking methods in order to provide recommendations for future online purchases and is increasingly adopted by governments in the form of state surveillance.

David Lyon (2003) describes the rise in technological remote surveillance as a reaction to the disappearance of physical connection and face-to-face relationships. This is a consequence of card readers, online access, mobile communication, and email, all of which require 'tokens of trust' and hence the need for advanced personalised identification, such as photo ID and biometrics, as a way of maintaining personal security. As human beings are abstracted and reduced to a system of data flows, social networks and commercial systems are developing ever more sophisticated Customer Relationship Management (CRM)² tools in order to take advantage of the way in which people interact, consume, and pay for goods (Lyon, 2003). Social networks such as Facebook do not allow aliases for this reason.

Mark Zuckerberg, CEO and creator of Facebook has stated that 'having two identities for yourself is an example of a lack of integrity' (Kirkpatrick 2011; Donath 2014). Social online spaces have resulted in the demise of the secondary self as spaces have adapted to fulfil the requirements and concerns of a more publicly aware self as the networks focus upon the individual. This has resulted in systems that are predicated upon the individual continuously being asked the following questions: Who am I?, where am I?, who am I friends with?, where have I been?, and where am I going? All of these questions return to the issue of location, in both the spiritual as well as physical sense. Location is now connected to everything.

² Customer Relationship Management (CRM) is an approach to managing a company's interaction with current and potential future customers that tries to analyse data about customers' history with a company and to improve business relationships with customers, specifically focusing on customer retention and ultimately driving sales growth (Management Tools - Customer Relationship Management - Bain & Company". www.bain.com. Accessed[1-2-2017)

Judith Donath (2014) argues that the removal of secondary identities within social networks oversimplifies the relationship between human relations. This argument supports the increasing backlash to the Facebook ethos in which online commentators have indicated that there are instances where a second anonymous identity is needed; e.g. when personal beliefs and practices may leave individuals vulnerable to attack if their identity was known. Donath identifies the changing attitudes to personal data sharing and how the online and offline environment plays an important role in the dissemination of personal information. This has been demonstrated to have life changing, and even devastating effects on individuals in cases of their personal information being made public. Examples include an individual's sexuality, political or religious beliefs, being revealed to a wider public which had not been previously disclosed to their family, or wider community.

Whilst Lyon (2003) has identified that consumers do not know how their personal data is being stored, nor how it is being used (Lyon 2003, p.92), my research will investigate personal fears of data sharing. Just as this journey began with an individual in a gallery refusing to accept the need to have a biometric passport, I will examine how shared personal data is perceived, not only for personal and commercial purposes but also increasingly as a form of surveillance.

1.4 Research objectives: A new type of PhD

The approach to this PhD research was non-traditional and utilised a collection of methods to explore new areas of investigation through a series of case studies. My PhD at Lancaster University was part of the innovative Creative Exchange

programme, one of the four Doctoral Training Centre knowledge exchange hubs funded by the Arts and Humanities Research Council. Here, the emphasis is to further develop research using multidisciplinary, practice-based research projects, alongside external industry partners, utilising a variety of mixed methods and co-design approaches to explore concepts around the subject of Digital Public Space.

The term Digital Public Space (DPS) was first defined by Tony Ageh at the BBC in 2012, and refers to an environment in which 'it will be vital to guarantee that everyone has access to this digital environment. And when it's all brought together, the resulting Digital – Public – Space will ensure that the benefits of digital technologies are well and truly shared and appreciated by everyone' (Ageh 2012). The concept of a Digital Public Space has subsequently been reworded by the Creative Exchange to engage within a wider context that spans a multitude of digital and physical spaces. The term encompasses a wide remit where it is designed to 'empower anyone, anywhere to access, explore and create with the newly accessible collections of media, public information and personal data trails which form the digital public space' (The Creative Exchange, 2012).

My research considers both the physical and digital impact of data sharing practices within digital public space, as well as considering how attitudes to communication and personal activities are increasingly directed through digital devices. I began by creating a series of exploratory questions based upon my interest in contemporary issues of sharing personal data. This was based upon the issue of connective memory; which expands on collective memory research and investigates how online

memories are collectively shared within social networks. This area of enquiry contributed to and expanded my previous research through the investigation into the perceptions of personal hidden data and how personal fears of sharing manifest.

The research investigated how the public is collectively implicit in sharing personal data through the practice of life-logging as a method of self-disclosure through personal communication, made easier through the utilisation of internet connected personal mobile devices. As a result my research question was designed to identify what strategies are available to designers working with shared data to combat fears of data surveillance and exploitation.

1.5 Scalability of the research

My research explored the concepts of fears of data sharing through a series of four practice-based projects. Each project was intended to develop over a period of 3 to 6 months in collaboration with external partners and academic colleagues. However this was not always feasible due to the time available from industry partners, and the available time from the academic parties. Academic schedules of teaching obligations, term dates, and conference deadlines from academic staff created challenges. Both academic and industrial partners were financially supported. For the academic sector this was to buy staff time to conduct research, while industrial partners costs were based upon the number of hours the project required. For projects such as Open Planning, this cost was underestimated and the company involved, Red Ninja, offered additional time in kind so that the project could be completed. The schedule subsequently was extended to 12 months from the original

6-month timescale. Red Ninja continued to support the project beyond the allotted time as the project represented both a financial benefit for developing further work with the other parties involved, as well as the kudos of working with an academic institution.

1.6 Expectations

Expectations varied among the combination of external partners, the Creative Exchange, academic Principle Investigators (PI) responsible for the academic direction of the project, and PhD researchers. For the industrial partner, the design of the project was predicated on building a final product (e.g. the Open Planning app designed by Red Ninja in collaboration with Liverpool City Council) that represented the collaboration and outcome of the research. For the partners, this culmination of work represented 3-6 months of the project, whereas the promotion of the process through blogging and tweeting, combined with a document of the progress of the project, was an important aspect for the Creative Exchange. For the researcher, the outcome often represented something different. In many cases, the process could not always be publicised as it did not reflect a positive message. On some occasions the discord between groups, or the rejection of an aspect of the project, had a greater value for the research than a successful outcome. On reflection, the expectation to deliver a successful project would often conflict with the PhD process, as the PhD research was not dependent on the success of delivering a final product or a positive outcome.

1.7 Thesis outline

The next chapter (Literature, Chapter Two) introduces the subject of fear whilst identifying an increasing dependence of online data sharing between individuals and organisations. The reference to fear constitutes a subject that exceeds the scope of this thesis; in this context, fear is used to identify the perceived threats that cause a change in behaviour as a result of technology (Taipale 2004). Chapter three defines the thesis structure, methodology of the research, and the research methods used across a series of practice-based projects. Practice-based research methods were used to investigate sharing practices and explore what is understood to constitute fears of sharing personal data. The research aim was to investigate, through a series of projects, how fear of sharing online personal information is perceived with the aim of assisting designers to utilise this knowledge to ascertain what causes fears of sharing personal data. This is followed in chapter four by four case studies investigating how online data sharing contributes to personal fears and is perceived to lead to a loss of control of personal information. The case studies reveal four different approaches, utilising a mixed methods approach to the research. The projects are Chattr, Open Planning, Physical Playlist, and TILO.

Chattr was an investigation into the ethical use of personal data and a play on the terms and conditions of the social network. Chattr created the environment of a social network and invited users to interact within the social space in return for the right to record, transcribe and make public all conversations that took place within the physical space. Open Planning was an investigation of current limitations when engaging the public in the urban planning process. The project objective was to look

at the feasibility of developing new systems using narrative processes with an aim to improve transparency, public engagement, impact and communication. Physical Playlist aimed to investigate the relationship between physical objects and digital content using the concept of the 'mix tape' as the basis for exploring the subject of sharing, trust, and value by embedding digital content into physical objects. And finally, TILO was an interactive screen-based technology designed to research visitors' willingness to exchange personal data as part of the interactive experience. TILO aimed to create a dialogue between the arts organisation, the building and its visitors, and allowed artists to carry out their own interventions.

Chapter five analyses the findings of the case studies and reveals how a perception of control, awareness, acceptance, ownership, and trust contributes to concerns of sharing personal information online. Chapter six concludes by bringing together the causal factors that are the basis for personal fears of sharing data in digital public space.

2 Literature

2.1 Introduction

The field of research relating to personal data sharing is a complex combination of commerce, computer security, networked mobile technologies, and social behaviour. This chapter presents an exploration and analysis of the literature relating to fears of sharing personal information online.

Fear of technology has always been present in the modern world. Zygmunt Bauman describes a fear through a lack of knowledge as 'derivative fear', from which there is a steady and systematic susceptibility to the perceived fear of the world (Bauman 2006, p.3). This personalised externalising of fear is not confined to any specific subject, and often 'acquires a self propelling capacity' (Bauman 2006, p.3). That is to say, fear knows no boundaries; it can migrate from a society's fear of an unknown disease to one of identity theft within the same week. The 20th century is littered with fears that have either been parked or have disappeared from the collective memory (Bourke 2005). The fear of contracting rabies in the UK after the opening the Channel Tunnel (1994), asteroids hitting earth in 2001, the Millennium bug (or Y2K) in 1999, including the fear of planes turning upside down at the stroke of midnight are all fears from the past 25 years. As Joanna Bourke suggests, the reason modern fears are more frightening is because they are invisible and global while being 'impossible to manage or avoid' (Bourke 2005, p.273). It is the perception of fear, a lack of control and sometimes false knowledge that connects them. As Bourke and Bauman have demonstrated, the relationship between fears of the unknown

creates a climate of concern and anxiety, which is amplified through a perceived lack of control.

Fear in the context of this thesis is defined across a range of literature from anxiety and depression of online lives (Campbell et al. 2006), internet trolling and fear of misinformation (World Economic Forum 2013; Chaffee & Metzger 2001; Buckels et al. 2014), technological fears (Altheide 2013; Rubinstein & Sluis 2008; Taipale 2004; Fang 2017), including Cyber-terrorism (McCarthy 2016; Stohl 2006; Weimann 2005), online privacy (Taipale 2004; Elahi 2009; Simpson 2011; Cho & Filippova 2016; Bergström 2015; Thomas et al. 2010; Olivero & Lunt 2004), identity theft (Lopucki 2003), spam, malware, spyware, bots and spiders (Fehr et al. 2016), and a fear of misinformation (World Economic Forum 2013; Kioussis 2001). There is also a state of detachment brought about by a lack of awareness of how personal information is shared (Dinev & Hart 2006; Roosendaal 2011; Lampinen et al. 2011). This is supported by examples of indifference (Sofsky 2008) and an acceptance that personal data, when shared online, can be used for commercial and political purposes. What the literature highlights is that sharing personal information is affected by knowledge of how social networks operate, levels of trust, control, and a need to protect personal privacy.

The focus of this study centers on the ubiquity of sharing personal information through social networks and how it can lead to fears of sharing personal data online. To address these issues I contextualise the legacy of public surveillance, through closed circuit television (CCTV) and the use of social networks to research the

increase in self-disclosure brought about by the rise of mobile phone and wearable technologies. I investigate the relationship between individual online behaviours and actions within physical space and identify how sharing personal information and photographs has become commoditised.

2.2 From the Panopticon, super-Panopticon, to the social network (SNSs)

In order to understand contemporary fears of online surveillance and the erosion of trust in the reciprocal trade of personal information, it is important to recognise how the relationship to electronic surveillance in the 21st century shifted from one of manual observation and control to a system of remote cameras and observers.

In *Discipline and Punish*, Foucault (1977) describes panopticism, a system of surveillance through centralised social control. He describes the state of being an object of information as a main cause of fear borne out of a system of control in which knowledge is used as a method of containment. Foucault writes about a medieval town consumed by plague that is under the control of the local authority. Guards are posted to observe and manage the population by keeping a strict record of those who continue to be seen to be alive and well. Each day, a roll call is enacted, describing a state of control in which, 'everyone locked up in his cage, everyone at his window, answering his name and showing himself when asked' (Foucault 1977, p.196). It is the thoroughness of the authorities that creates a state of fear through mechanisms of 'surveillance based on a system of permanent registration' (Foucault 1977, p.196). Foucault uses these analogies to later describe the Panopticon, a tower

designed by Jeremy Bentham, which was described as an efficient prison complex that relied on the perception of being observed from a central tower.

Unlike the system of containment of the plague town discussed earlier, Foucault's Panopticon, based upon Bentham's architectural design relied on an open framework and was viewed as more efficient due to the reliance on a perceived fear of control. The design of a circular tower, with a series of cells radiating from a central hub, created a system of observation in which a supervisor could observe all the cells from the central position. All the cells had windows facing outwards from the central spine, and the supervisor was able to see any movement within the cell. In contrast, the supervisor's environment was shielded by a series of blinds that allowed the individual to move freely within the space without compromising the illusion of a permanent state of surveillance. The Panopticon demonstrates its effectiveness whether the guard is in the tower or not. As Foucault suggests, 'visibility is a trap ... he is seen, but he does not see; he is the object of information, never a subject of communication' (Foucault 1977, p.200). The state of surveillance relies on order and control, in which the prisoner, worker, or patient is controlled through a strict environment. Foucault states that 'society is one not of spectacle, but of surveillance' (Foucault: 1977, 217), suggesting that the power of social control is through a centralised accumulation of knowledge (Foucault: 1977, 217). In defining the system of centralised and social control, Foucault also acknowledges a state of control and power in which there is a distinct master and slave relationship. Thus, a centralised control is based on a historical perspective that reflects the world-view of an analogue 20th Century.

Just as Foucault suggests the prisoner in his jail cell has no way of knowing if he is being observed, so too the physical presence of modern cameras in the city or the factory suggests a method of control through surveillance that is faceless (Koskela 2000). However, the Panopticon was designed by Bentham as a mechanism of control over the prisoner and the workforce; modern forms of surveillance are portrayed by governments, public and private institutions as systems of policing for the benefit of the public. The perceived view of surveillance has shifted from a central position of authoritative containment and restraint to one of alleged authoritative altruism for the public good.

Tensions between information sharing and control

Authorities in the digital age continue to identify the social benefits of shared information through the mechanisms of surveillance such as the shared use of personal information for the benefit of 'medical research and protection against terrorism' (Steeves 2002, p.193). The rhetoric of the benefits of surveillance now manifest in the everyday, from the train company that pipes an automated audio message for the benefit of its commuters, stating 'CCTV is in operation for your safety and security', to the graphic symbol of a camera printed on the walls of the London underground to suggest that cameras are watching for security purposes. The representation of surveillance is ingrained within modern social practices. The similarities remain between both negative and positive connotations of surveillance, insofar as perpetual observations described in the Panopticon still exist in electronic form. Cameras now replace the guard in the tower, so that just as it was not known

whether the guard was watching, the presence of a camera conceals the knowledge of whether there is an observer or not.

The rise in digital technologies has increased the volume of surveillance methods. Surveillance today exists in both physical and digital space; the physical surveillance of CCTV represents the guard in the panoptic tower, whereas surveillance in digital public space represents a more open and public manifestation. Richard Chalfen (2002) indicates that the number of surveillance methods is likely to increase, and 'foster new Orwellian distress'. However, the suggestion that surveillance has led to an Orwellian state opens up the debate that we are living through an era less controlled by the state but closer to a socially maintained Huxleyan existence, controlled by a drug induced fantasy world of consumption and leisure.

Five-stepping with the other four hundred round and round Westminster Abbey, Lenina and Henry were yet dancing in another world, the richly coloured, the infinitely friendly world of soma holiday. How kind, how good looking, how delightfully amusing every one was! 'Bottle of mine, it's you I've always wanted.' But Lenina and Henry had what they wanted. They were inside, here and now safely inside with the fine weather, the perennially blue sky. (Huxley 1932, p.69)

In the soma induced world described by Huxley, people are willingly seduced and compliant to authoritative power just as individuals today share personal information and are 'seduced to conform by the pleasures of consuming the goods that corporate power has to offer' (Shearing & Stenning 1997, p.304).

David Lyon suggests that we 'already inhabit societies where personal data are commodities' (Lyon 1994, p.188) to describe the trade in personal information in exchange for discounted consumer goods. Just as in Alan Westin's 1990 survey on privacy in which people are categorised into a series of groups, Westin divides people as 'privacy fundamentalists', those who advocate a zero tolerance on sharing information, the 'greatly concerned', who have an awareness but still share personal information, and the 'unconcerned', who do not consider publishing personal as a threat to personal privacy (Lyon 1994). Although Westin could not identify why individuals might trade privacy for consumer benefits, Westin proposed that the consumer would ultimately decide whether personal information was considered tradable (Lyon 1994).

2.3 Super-Panopticon

With the introduction of the networked database the need for cameras and observers has been superseded. Consumer data and online environments have created new situations for data to be shared. However, the automation within networked environments has also created fears of sharing personal data. Poster (1996) puts forward a case for the super-Panopticon, in which the database has replaced the need for cameras and observers. The argument identifies that, with the increase in the trade of personal consumer information, the 'private act, [while purchasing goods] becomes part of a public record' (Poster 1996, p.183) as transactional data becomes a public form of surveillance data. Poster (1996) identifies that 'the one being surveilled provides information necessary for the

surveillance' (Poster 1996, p.184). Surveillance, in this instance, is associated with financial transactions that can only be circumvented by using cash to protect anonymity, whereas Social Network Sites (SNS) have increased the trade in personal information in exchange for access to online services. The reciprocal exchange of personal information for 'consumer benefits' (Lyon 1994; Shearing & Stenning 1997) has not only become market orientated, but driven through the commodification of surveillance by 'self-disclosure' (Taddicken 2014) within virtual and social networks. As Wall (2006) suggests, 'privacy is becoming a tradable commodity' (Wall 2006, p.357).

2.4 Hegemonic exchange

Through the commodification of the self (and quantified self), as Jean Baudrillard suggests, 'we are [now] hostages far more than slaves' (Baudrillard 2010, 34), by implying that the demise of a dominant state of surveillance and a perceived fear of central control (Foucault 1977) has given rise to one of hegemonic exchange. This shift away from the panoptic view and a fear of observation has been overthrown and replaced by a dispersal of power beyond the super-Panopticon. Baudrillard (2010) describes a paradigm shift from one of governance and domination to a hegemonic state in which 'servitude' has been substituted with one of a voluntary nature. Power has been inverted and we are, 'caught in a vast Stockholm syndrome, the alienation, the oppressed and the colonised are siding with the system' (Baudrillard 2010, p.37). With the disappearance of a dominant power, the economic shift from one of production to a state of consumption has created multiple networks in which there is no longer centralised state control.

The networks described by Baudrillard are the interconnected computers that create the internet. As Benkler (2006) states, these networks are a 'communications environment built on cheap processors with high computation capabilities, interconnected in a pervasive network' (p.3). Networked digital spaces require simultaneous access that does not reflect physical space; thus, the portrayal of surveillance described by Foucault or Poster cannot be associated with the remote, disparate spaces described by Baudrillard. When one enters physical space, there is a sense of presence through proximity that can be surveyed; in virtual networked spaces, it is unknown whether the space is already occupied, being viewed simultaneously, or whether the viewer is known or unknown (Mitchell 1996; Foucault 1977; Foucault 1984). As Mitchell suggests, 'we meet in places that cannot be found on city maps' (p.36). Benkler (2006) suggests that the 'networked public sphere', which emerged from the origins of the internet, prior to web 2.0 and the emergence of social networks, has been the result of a growing freedom from the origins of the 'mass-mediated public sphere'. Early objections to democratising the internet included fears of a system out of control. Benkler (2006) calls this the 'Babel objection', suggesting that when 'everyone can speak, no one can be heard, and we devolve either to a cacophony or to the reemergence of money as the distinguishing factor from obscurity' (p.10). Despite this view, Benkler paints a picture of a democratic and free world in which individuals narrate their lives through a form of coordinated, online 'information production':

By making it possible for many more diversely motivated and organised individuals and groups to communicate with each other, the emerging model of information production provides individuals with radically different sources and types of stories, out of which we can work to author our own lives. (Benkler 2006, p.175)

This argument identifies that while the internet offers new opportunities and platforms for democratic choices, it also offers political freedoms that reside outside of the traditional economic structures, borders and time zones. While this does hold true in specific cases, such as the revolutionary methods that contributed to protests during the Egyptian uprising (Ghonim 2012), the suggestion that we 'author our own lives' (Benkler, 2006), is not strictly accurate. Benkler describes a positive democratic perspective of the networks, which Baudrillard does not share. Baudrillard (2010) describes these networks as a 'virtual catastrophe', free of market control, outside of capital constraints, which will eventually lead 'to the dictatorship of forced exchange, [in which] no one will escape' (p.44). The outcome of free access to networked environments has resulted in giving the individual responsibility to manage content through a cloud-based solution, while at the same time, reversing the concerns over data loss and reducing anxiety in the online environment. However, the ubiquity and automation of personal content that is redistributed across networks has created new risks when sharing personal data online.

2.5 Lifelogging

The increase in personal data gathering through the use of wearable computer devices has led to the term 'lifelogging', in which individuals distribute photographs, gather personal data to monitor their health, and share this data through mobile applications and social networks. The expression 'quantified self', a result of 'lifelogging', refers to using personal devices to record a range of data that represent an individual's movements and biological signals (e.g. heart-rate, skin connectivity, sleep patterns etc). Examples of wearable technology include devices such as the Pebble watch, Apple's iWatch, wristbands by Fitbit, Jawbone, and Nike's Fuelband that register physical movement, as well as Memoto and Autographer which capture and organise photographs by time, date and GPS location. All of these examples encourage personal data sharing. Data is increasingly including video, with GoPro cameras becoming popular amongst extreme sports enthusiasts, who wish to share personal experiences online, and road cyclists and commuters in support of insurance and legal claims in the event of an accident.

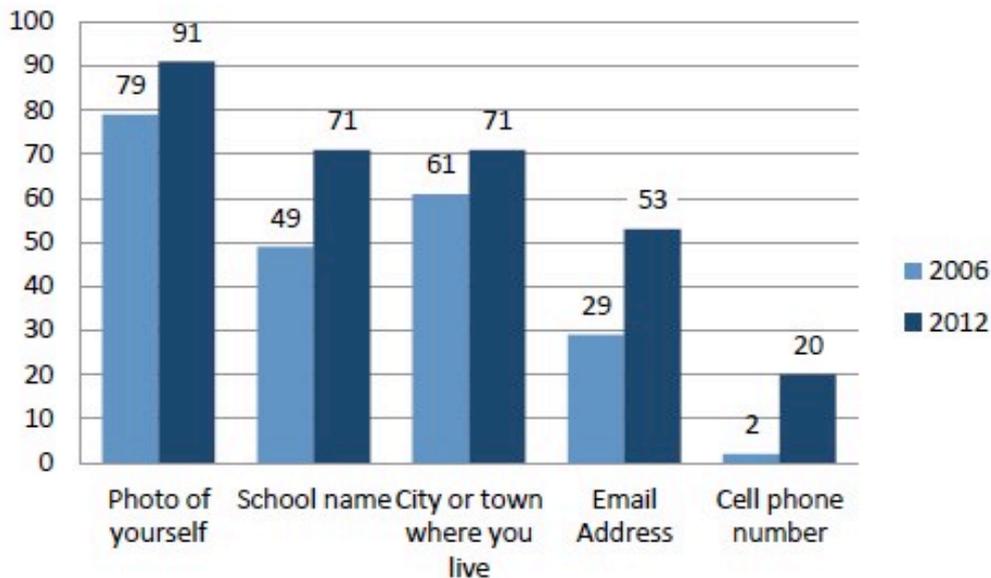
Data is shared for personal, political, and competitive sporting activities where individuals share personal bests, fastest times, and longest distances with online communities. An example of this is making a cycle route public: GPS technology links the time and location recorded by satellite and plots the speeds of each marker on a journey. The process of sharing creates the opportunity to compete virtually and time independently with other cyclists who also can plot their own personal information against each competitor. Data can then be visualised and shared through a number of online applications. The European Network and Information

Security Agency (enisa) suggest that benefits of lifelogging include 'networking opportunities, building social bonds through enhanced communication and reduce isolation and a greater awareness of personal health' (Enisa 2011, p.6). This data can be as innocuous as the number of steps walked in a day or a visual record of the route taken to work.

However, publishing data of a regular route to work or school has the potential to be abused and lead to acts of cyber-stalking, malicious attacks or online grooming (Enisa 2011). The enisa report indicates the top risks are, 'threat to privacy, loss of control leading to financial fraud, psychological damage, and a risk of erosion of social values' (Enisa 2011, p.8). However, many users are not aware or inhibited in engaging in sharing personal information while the commercial profitability of personal data suggests that, whoever has control over this data, would have a 'competitive advantage' (Enisa 2011, p.7).

While personal data sharing has increased with the rise in mobile technologies and wearable computers, the risks of aggregated personal data sharing are not fully understood. The graph below (See Figure 3) from the Pew Institute survey on teenage privacy (Institute Pew Research 2013) demonstrates the increase in personal data sharing between teenagers between 2006-2012. The increase in low cost devices, as well as the integration of data logging in mobile phones suggests that many individuals do not perceive an increased risk or lack of control when shared with other personal information (Skatova et al. 2013).

Social media profiles: What teens post – 2006 vs. 2012



Source: Pew Internet Parent/Teen Privacy Survey, July 26-September 30, 2012. n=802 teens ages 12-17. Interviews were conducted in English and Spanish and on landline and cell phones. Margin of error for results based on teen social media users is +/- 5.1 percentage points. Comparison data for 2006 comes from the Pew Internet Parents & Teens Survey, October 23-November 19, 2006. n=487 teens with a profile online. Margin of error is +/- 5.2 percentage points.

Figure 3. Pew internet Parent/Teen Privacy Survey. Source: <http://www.pewresearch.org>

This example demonstrates the ease in which photographs can be sent in real time across virtual networks. This is the result of not only a technological advance but also a sociological change through the methods of storytelling. Whereas photography was once used as means of narrating with the aid of an image, the digital image through the technology of the 'mobile phone images have become a kind of visual speech – an immediate, intimate form of communication that replaces writing' (Rubinstein & Sluis 2008, p.18). The shift in photography from analogue to digital replaces the traditional method of verbal storytelling whereby photographs were

shown in a physical space by the author to participants who would be told oral stories around the images and not 'by the image' (Miller & Edwards 2007). Mobile phone photography is not only digital, but it has also become a 'currency for social interaction' (Van Dijck 2008, p.62). Van House & Davis (2005) support this in that images taken on a mobile phone are shared for 'their communicative value, often highly transitory, indexical images used as messages' (House & Davis 2005, p.2); Van Dijck (2008) signifies the use of photography as a form of visual speech; an alternative to physically meeting, a way of 'touching base: "Picture this, here! Picture me, now!"' (van Dijck 2008a).

2.6 Post-photography

The focus on the appropriation of photography within this chapter highlights the ubiquity of the digital image, and the shift of the analogue photographic image as an aid to storytelling to a digital method of identification and tracking. The 21st century has witnessed a progressive, yet subtle, threefold shift in methods of surveillance. From the physical observer to the electronic camera; from a perceived negative connotation of physical control to a position of altruistic good; from closed circuit television (in the context of a contained environment within CCTV) to a public and digital form of 'self-disclosure' (Taddicken 2014) through the publication of personal photography and self regulation of social networks.

As the camera shifted from analogue to digital, the photograph, like the instant message, became quantifiable. The 'networked imaging devices, contextual meta-data, online image sharing, and re-use of digital content are making image creation

and use an increasingly collaborative activity'. (House & Davis 2005, p.1). As a result, post-photography (Lister 1995) represents contextual information linked to the commodification of the image that is built upon technological access to identification and location data, and less about the narrative of events that surround the image.

It is the demise of the author that has created the position of 'post photography' (Lister 1995). In the same way the mobile phone liberated communication, the mobile device has become the tool of choice for the post-photography generation. The rise in the publication of images through social media sites (SNS) allows the publisher to publish whatever and whenever. This arbitrariness is both carefree and careless. It does not discriminate, but not in the same way that William Eggleston (1989) defined his style of photography as 'democratic'. In Eggleston's world, everything has its own value, a place where there is no hierarchy in the depiction of events or objects:

What have you been photographing here today, Eggleston?

Well, I've been photographing democratically, I replied.

But what have you been taking pictures of?

I've been outdoors, nowhere, in nothing.

What do you mean?

Well, just woods and dirt, a little asphalt here and there.

I was treating things democratically, which of course didn't mean a thing to the people I was talking to.

(Eggleston 1989, p.171)

Photographs in SNS are perceived to be democratic and hold meaning and memory for the individuals that post them to a wider audience. These images are tagged with

a message that attempts to define or anchor it with further meaning, although this often relies on social groups to tag and to describe images to give it meaning to a collective audience (Garde-hanson 2014). The changes that have occurred as a result of the transition in photography from analogue to digital, as well as the integration with a networked society, has led to consequences for communication and privacy, both of which are yet to be defined.

2.7 Collective narrativisation

The virtual networks that Baudrillard described as hegemonic and voluntary have infiltrated social life as a tool for communication that integrates social and collective storytelling. The plurality of the storyteller (Benjamin 1970) has shifted to that of a collective notion of narration through democratic narrativisation (Jansen 2009). The cumulative sharing of personal events and information begins to change the way the environment is perceived, as 'we are prone to misattribute – to think we remember something that, in fact, hasn't happened' (Mayer-Schonberger 2011, p.20). The structure of the social network is designed to reflect a form of episodic memory store that depicts a linear narrative of one's life in a visual form where the public view is of a 'past that is continuously narrativised so as to create and maintain an ongoing, meaningful 'thread of life'' (Jansen 2009, p.50).

Not only is this a time of collective narrativisation, but one of ubiquitous banality, where the everyday mundane is recorded and distributed like never before. The amount of photographs uploaded to Facebook every day is in excess of 300 million while the amount deposited on Flickr is 1.8 million per day. By August 2011, Flickr

had exceeded 6 billion photographs on the site. The image-maker records the closest detail of the world around him or her; the image-maker is on the train, documenting their way to work, from photographing their lunch to what they are wearing. Baroness Susan Greenfield, referring to the way smart phones document everything, described photographing the banal as a method of self-promotion during an interview on BBC Radio 4's Today programme:

Taking a picture of your chocolate cake, you are not creative! The way you live your life is to impress others with the chocolate cake, rather than to enjoy the chocolate cake. (Greenfield 2013)

Depicting the banal to highlight the conditions of decrepitude locations was once a specialist role of the documentary photographer; whereas the everyday is no longer the preserve of the flâneur and the masses (Baudelaire 1964; Benjamin 1970). This is now presented as a perpetual round robin in the form of Facebook and Twitter. The demise of the edited highlights of seasons past is offered up a constant flow of unmediated photo-effluent. The mobile device has become the tool and mediator through which content is collated within social media. This generates a form of narrativised 'digital narcissism' (Watts 2013) through 'information bricolage' (Mayer-Schonberger 2011). Consciously or not, the tools themselves have begun to determine a new perspective on the way the world is perceived. As Van Dijck (2010) writes, 'Individuals articulate their identities as social beings by uploading photographs to document their lives; they appear to become part of a social

community through photographic exchanges and this, in turn, shapes how they watch the world' (p.2).

Not only does post-photography introduce a new form of image creation and exchange, manipulation occurs within the device that predetermines how and what is photographed. This determining factor has now become the vocation of the device and the networks that Van Dijck (2011) refers to as 'engineered sociality' (p.3). The shift in the image creation from analogue to digital affects the understanding of how photography and past events are represented. This 'caused shared digital information to become de- and re-contextualised within the control of the author' (Mayer-Schonberger 2011). The strength of photography was in the power of a single image to communicate a story. However, images are no longer singular. They can form a stream where the act of photographing and the motion to shoot (Sontag 1979) has been replaced with the inclination to scan. Even the power of aiming has become arbitrary, as panning dominates proceedings while the device scours the faces at the wedding, the landscape or party. The latest Nikon takes a series of images before the user has the opportunity to consciously think about taking a photograph. The outcome of this advance in technology is twofold. First, a moment is never lost as the image is taken in a synchronised burst of activity within the device. Nikon describes this as a 'living image' (Nikon.com, 2013) where the technology 'begins to capture the image before you even take the shot, and continues after you've done' (Nikon One camera publicity, Nikon.com, 2013). Second, the best image can be selected from a multiple stream of images that were shot before and after the shutter was released as the camera recommends shots

based on factors such as facial expression. The combination of camera and online technology has indirectly influenced collective storytelling. The amalgamation of camera features of 'living image' technology (Nikon, 2013) combined with the ability to upload to social media sites directly from the camera creates a network has the potential to instinctively narrate the image.

Social networks are designed to collectively narrate memories through the photographs and stories that are uploaded. Each post, whether a photograph or message, is defined in the abstract as numbers and values that relate to personal information, in which the photograph has become an unknown commodity in the field of data exchange. As the photographic image has moved from an analogue form to a digital one, the image is no longer made up of grain but numbers. The technological shift has moved to a point where the online algorithms are now sophisticated enough to identify individuals within a series of images. Facebook uses a system known as 'Tag suggest' where it engages facial recognition technology to speed up the process of labeling or tagging friends and acquaintances that appear in photographs posted on the network. Other online services such as Google+ have similar processes for identifying individuals through the process of image recognition.

What this identifies is that personal data is no longer based upon financial transactions and personal disclosures but a combination of data. As information is gathered or mined in the digital space, aggregation and secondary use of personal data is known to undermine privacy (Solove 2007). The process of data mining is

defined by the process of storing data and extracting information from large data sets for further use. Aggregation of data in this context allows for many systems to converse and to bring multiple sources together to build further analytical perspectives on users' habits and behaviour: 'by combining pieces of information we might not care to conceal, the government can glean information about us that we might really want to conceal' (Solove 2007,p.18).

The secondary use of personal data is often applied where patterns emerge to identify and build a user profile that can be commoditised and an individual directly targeted. Aggregation raises concerns of data capture of individual information where the user has no knowledge that data is being stored or reused, (Roosendaal (2011), uses the term 'exclusion' to describe this phenomenon). One result is an erosion of trust between individuals and organisations, such as the relationship between commercial services and banks who control online transactions in which identity theft and credit card fraud have been categorised as the main cause of a breakdown in trust linked to online behavioural change (Dinev & Hart 2006). In studies, up to 80% of the public indicate that they perceive to have lost control of how their personal information is circulated and used by companies (Milne & Boza 1999; Dinev & Hart 2006).

The instant the technologies intersected, the mobile phone became a global broadcasting tool. Messages and images can be indexed, identified and connected via networks to an individual, or group, based upon the author. Just as messages contain text, images are made of pixels, all of which can be machine read. The

reference to both mobile technologies and the photographic image here are not accidental; the implication of smart-phone technology that combines a digital camera with the ability to post to SNS highlights the subtle but significant shift from the original use of an image to one of communication and commodification. This also reveals how the transition from analogue to digital has resulted in the use of images as a method of self-regulated surveillance. As Lyon (1994) has previously suggested, the ability for systems to share personal information creates divisions between the 'privacy fundamentalists' and the 'unconcerned' (Lyon 1994), which also can be applied to the way photography is appropriated throughout SNS. This has resulted in both mistrust and indifference as soon as photography became digital and could be duplicated and shared through networks, resulting in the ability to be tracked and traced.

While users of networks maintain personal information online, the content is co-curated within the framework of the networked infrastructure. Shared content is often mediated between individuals and SNS, such as Facebook, in which SNS 'can restructure, at will, how your life is organised' (Garde-hansen 2003, p.136). Jose Van Dijck argues that social networks transform the public sphere by creating an 'engineered sociality' (van Dijck 2011, p.3); Bucher (2012) calls this 'programmed sociality' to describe a 'system of production and occlusion of information that can be programmed' (p.490) that is far removed from the traditional notions of how friendships naturally occur. Both Van Dijck and Bucher support Baudrillard's argument that social engagement through networks leads to becoming hostage to the system, in that 'friendships become attached to users' digital personae, which

they cannot escape' (Bucher 2012, p.490). For many users the fear of missing out (or FOMO) stops them from leaving social networks. As Lovink (2016) has intimated, individuals are 'half logged into the participatory culture, its silent nightmare of presence' (Lovink 2016, p.54), illustrating the pervasiveness of the social network on contemporary society.

2.8 'Real-time' responsiveness leads to a lack of fear

The immediacy of the instant message that was made possible by the mobilisation of technologies has enabled individuals to engage in and broadcast global events using only the everyday devices that are carried on the body. The tools that are used also affect the choices that are made in this shifting global environment (Virilio 2012). It is this shift, which has been brought on by the 'real-time' perspective of the computer age:

Real time is the time of the now, of the 'taking place' of events – it is specifically opposed to the subsequent, the 'after'. Ideally in real time, there would be no gap between the phenomenon and its analysis. Current definitions of real time tend to emphasise speed of response or reaction time, suggesting that interactivity, or the aspiration to interactivity is what distinguishes computer real time from film and television. (Doane 2006)

As Doane (2006) suggests, society today is living at a pace of the instant message, that only knows of 'real-time' responsiveness. The asynchronous communication or 'disruptive spatiality' (Harvey 1990) relates to the collapse of time and space due to

the fragmentation of information and communication becoming global. Through the latest technological innovations of instant global communication and internet relayed chat (IRC), all of which negates the traditional forms of travel and communication, the individual has access to and perceives a world through the lens of a personalised 'real-time' communication channel.

The technologies that support access to the networks, including devices on the periphery, such as cameras, televisions, audio and video devices are creating new connective interactions. During the infancy of online interactions, before WIFI, 3G, and 4G mobile connectivity, all online connections relied upon dial-up access in which an individual entered and conversed online from the confines of their home or office. With the introduction in mobile internet access, interactions occur instantaneously within public places, which have increased with the emergence of connective mobile technologies and social networks. The increase in the speed of data alongside the rise of mobile interactivity (such as individual location from GPS data) has enabled people to connect in situ to services, which are free at the point of delivery. There is little formality in this form of trade, often concealed within the technology of the mobile device. The ability to communicate and share information instantly has contributed to a lack of awareness of data sharing. Just as the rise of the personal computer demonstrated a rise in networked environment and a loss of personal control, the proximity of mobile devices contributes to a perception of being in control that forms levels of trust.

2.9 Trust and control

Trust relates to the relationship between individuals and the use of social media services as a communication medium. Existing literature has identified that protecting personal privacy is closely related to trust in safeguarding social interactions online (Dinev & Hart 2006; Seigneur & Jensen 2004; Erlich et al. 2014; Henderson & Gilding 2004; Taddei & Contena 2013; Lampinen et al. 2011). In a number of studies, trust is associated with online financial transactions in which familiarity of the product encourages trust (Frye & Dornisch 2010; Bucher 2012; Skatova et al. 2013), just as regularity and frequency of interactions contribute to trust online (Longo et al. 2007). Studies have identified that trust has a close affinity with control when disclosing personal information. As one study suggests 'young people do not have a detrimental fear for their privacy that determines their online behaviour, but that control and trust are crucial and more able to influence their effective disclosure behaviour' (Taddei & Contena 2013, p.825). This is supported by Zimmer (2010) who suggests that an increase in trust causes a reduction in the perception of the risk connected with privacy. It is trust that 'facilitates cooperative behaviour' as users are more likely to participate online if they receive assurances that they are interacting in a trusting relationship (Shneiderman 2000). Other studies have designed and put forward the case for trust models to be integrated in social networks in order to manage trust relations in environments where there are currently none (Liu, L. ; Xiong 2004; Seigneur & Jensen 2004; Longo et al. 2007).

In a study on perceived risks of personal data sharing, Skatova et al (2013) suggested that individuals perceive bank information to have the highest priority and were

willing to pay the highest premium to protect it, whereas social media was rated as a medium risk. The study also highlighted that participants underestimated the relationship and risk between combined data types, with new data potentially being created that reveals more than sum of its parts. While this directly corresponds to online financial transactions, personal online interactions are also highlighted to suggest that users, uncomfortable with specific companies, will remove information if they consider their personal information is threatened or they lose trust with a specific organisation (Son 2008). A contradiction to this is suggested where a 'cost benefit analysis' takes place (e.g. accepting free offers in exchange for personal information) (Son 2008). This is often in exchange for access to services in which 'users are willing to give up information in return for customised information to fulfil a need to seek information, communicate, interact, or complete a transaction' (Hazari & Brown 2014, p.32).

2.10 Trust and control lead to reciprocal trade

For many users, the detail of what will be shared is provided during the signing up process whereby the user agrees to the terms of service before access is granted. Services such as teleconferencing, digital storage, email accounts and related facilities are often offered in return for access to the data behind the utility. However in the pursuit of better disclosure and less opacity, the UK Government Science and Technology Committee report, Responsible Use of Data (HM Government 2014), identified that there was a tension between the data generated by individuals and how control was orchestrated between organisations. The report continued to identify, 'We have not been convinced that the users of social media

platforms are fully aware of how their data might be used and what redress they may, or may not have if they disagree with how an organisation exploits that data' (UK Government Science and Technology Committee report, 2014).

When participants of the Skatova study were questioned about personal data, it is evident that data is perceived as an abstract concept that only can be identified as a physical entity such as bank information and a physical address. When it is suggested that this information is the annexing of multiple data types, the process of addressing what this looks like and how best to protect it becomes more difficult.

What the Skatova et al. (2013) study and the UK Government Science and Technology Committee report (HM Government 2014) do not identify are the intricacies of social network data that separates geo-spatial information from SNS. Often these are linked as the increasing access to social networks has become mobilised. Geo-location tracking is used to optimise the relationship between individuals and the social networks that encourage the individual to post and tag with location data as part of the service. For the SNS service, this can build a more accurate picture of an individual and offer better services such as localised transport information, restaurant guides, and finding a friend within a physical space who is part of an individual's online community.

2.11 Reciprocity

The reciprocal trade in personal information is increasingly linked to trust when disclosing personal information (Luo 2002; Liao et al. 2011; Frye & Dornisch 2010;

Taddei & Contena 2013; Henderson & Gilding 2004) as 'Trust is the willingness to take some risk in relation to other individuals on the expectation that the others will reciprocate' (Walker & Ostrom 2003, p.382). In this context, reciprocity occurs through the exchange of personal information and what is offered in return. For many people, this is often the ability to freely communicate in real time between friends and colleagues; for others, a reciprocal trade is predicated on the awareness of what content is being harvested at the time of the exchange, which can also lead to disengagement. However, it is also the same trusting relationship, or friendship, that SNS use for commercial gain as 'a social relation implies trustworthiness, friends can be used for commercial purposes. The perceived commercial value of friends and their relations have been put at the very center of Facebook's engineering efforts' (Bucher 2012, p.488). This is countered by the consequence that time spent online affects trust, as the more literate the individual there is less trusting of online transactions (Liao et al. 2011).

The following table (table 1), based upon the example in Liao and Liu's (2011) study, identifies the relationship in the current literature in relation to trust:

Table 1 – Concepts of trust

Trust concept	Measures of trust	Authors
Disclosing personal information when using e-commerce systems	Trust, e-commerce, self-disclosure	(Frye & Dornisch, 2010)
Peer-to-peer reputation based trust, recommendations for automated trust credibility checks on file sharing.	Trust model, reputation based P2P	(Liu, L. ; Xiong 2004)
Personal privacy protection, technological control mechanisms for trust without privacy loss.	Trust model, privacy, risk management, e-commerce	(Seigneur & Jensen 2004)
Temporal factors, timely interactions used as an evidence of an entity's trustworthiness.	Temporary trust model, time based interactions	(Longo et al. 2007)
Trust in medical research, de-identification in protecting large scale data in genetic research.	Trust, identity protection	(Erlich et al. 2014)
Investigation of uncertainty, how interpersonal trust impacts on knowledge sharing.	Interpersonal trust, knowledge exchange	(Hsu & Chang 2014)
How familiarity in e-commerce environments encourages trust.	e-commerce, familiarity	(Frye & Dornisch 2010)
Why consumers read or don't read privacy notices	Trust, privacy and risk, e-commerce	(Milne & Culnan 2004)
Positive experiences and reputation contribute towards trust in organisations	e-commerce, reputation based trust model	(Milne & Boza 1999)
'pre-commitment' and a leap of faith definition in trusting online environments.	Self-disclosure, leap-of-faith trust model.	(Henderson & Gilding 2004)
Cultural differences affect trust in privacy concerns in disclosing personal information.	Self-disclosure, Cultural difference	(Wu et al. 2012)
Levels of trust affect privacy concerns, an increase in trust causes a reduction in the perception of risk.	Self-disclosure, Trust, privacy, and risk	(Taddei & Contena 2013)
Information relevance influences trust	Self-disclosure, trust and risk	(Zimmer et al. 2010)
Friendship is linked to trustworthiness, which can be used for commercial purposes.	Friendship, self-disclosure, e-commerce	(Bucher 2012)
Trust is implemented in sharing	Photo-sharing, P2P trust	(Cho & Filippova

photographs by social norms, limiting and controlling access	model, control	2016)
Sharing online is based on trust in managing the boundaries of privacy and publicness	Trust, privacy, boundary regulation, self-disclosure.	(Lampinen et al. 2011)
Internet literacy affects trust, the more literate the less trusting of online transactions.	Internet literacy, trust, e-commerce	(Liao et al. 2011)
Trust and reciprocity, psychological methods in evolutionary focus of trust	Reciprocal trust, game theory	(Walker & Ostrom 2003)

2.12 Awareness of personal data

The consequence of sharing personal information has led to a proliferation of leaks, thefts, and growing anxieties amongst the public, resulting in a greater awareness of privacy concerns and wariness about divulging information (Elahi 2009). Whereas for others, the volume of public and online surveillance has led to indifference and privacy apathy (Sofsky 2008). What this identifies is trust is bound in a complex relationship between awareness and the risks associated with data exchanges in the reciprocal trade in return for services or goods. What is evident in the literature is that, while there is an understanding that users engage with online services for personal rewards, there is a lack of knowledge of what constitutes personal data and how service providers make use of it.

An example of a lack of data awareness is a recent study of credit card meta-data, combined with photographs of celebrities arriving at sponsored events. The analysis revealed the lack of anonymity of individuals' physical movements by identifying the correlation between the times photographs of celebrities were taken with the times they arrived by taxi and the price they paid for the fare. Despite names being

omitted from the taxi firm's dataset, the individual could be linked via the time-stamp of the photograph and the data cross-referenced with the fares paid. The study of taxi fares indicated that while one set of data on first inspection appears innocuous, combining data sources can lead to correlation attacks (Bohannon 2015; De Montjoye et al. 2013). Correlation attacks can be associated with secondary use of personal data as personal data is mined and reused. Amore (2011) takes the argument further to imply that 'new forms of inferential reasoning' (Lyon 2014, p.6) creates data derivatives (Amore 2011) which can be used to compare data sources for predicting individual movements. This example highlights the concerns for exclusion, in which data is collected without the users' awareness (Roosendaal 2011). In the example of Facebook, the collection and use of personal data is generated such that 'every site that includes some kind of Facebook content will initiate an interaction with the Facebook servers, therewith disclosing information about the visited web site together with the cookie' (Roosendaal 2011, p.7). This disclosure is done without the users' knowledge and the details are passed back to Facebook whether the user is a member of Facebook or not.

The representation of what constitutes data, and the theft of personal data, is often portrayed through media reports as concerns rising over online surveillance. An example of this was interpreted across a range of tabloid and online news outlets in 2014, when Facebook was accused of snooping on customers by installing an audio listening feature within its popular mobile application. Facebook described this as a feature as providing customised services based upon the customers' television and music preferences. In an attempt to identify how news media represents stories

about data sharing, I analysed over 30 news reports with a view to counterbalancing and identifying what constitutes personal data. The result identified a series of disparities across the reports in which a range of terms was used to describe how data was gathered. The media representation stated that data obtained from recording personal audio through a mobile application was to be used for a range of purposes. These reports ranged between, 'Facebook wants to "listen" to your music and TV' (BBC 2014), to 'Facebook knows what you're watching & listening to' (Channel 4 2014), and 'Passive listening will soon be a feature for Facebook app during status updates' (Ars Technica 2014). Across the range of news reporting platforms that represented the single story on 22 May 2014, no media outlet had concluded what constituted personal data in relation to the specific recording of ambient sounds within private spaces, especially when associated with access to the microphone within an individual mobile phone. Many news stories reported contradictory accounts of data concerns. Some suggested that the sounds heard by the microphone were recorded; others suggested Facebook does not store whatever data is collected as sound. Terms such as capture, gather, harvest, collect, store, keep, archive, aggregate, and mine was used to describe how personal information is obtained. However, Facebook suggested that it had intentions to archive the data that was obtained from the listening tool, which has implications for data security, and how personal data is shared.

2.13 Technological fears

The increasing use of the personal computer in the 1990s introduced concerns over 'computer anxiety' (Stewart et al. 2002; Korzaan et al. 2009) whereby individuals are

prone to concerns over data mismanagement and loss of shared personal data. Earlier studies of computer anxiety (Stewart et al. 2002; Korzaan et al. 2009) investigated why individuals were fearful 'about current or future use of computers' (Stewart et al. 2002, p.44) that identified tensions between sharing and the ability to control personal information. Smith et al. (1996) suggest that individuals believe that private companies store too much data, inaccurate data, use data for undisclosed purposes or fail to protect access to personal information. Stewart et al. (2014) also states that individual anxieties are supported when there is a lack of personal control over managing personal data between third party organisations. Whereas computer anxiety was concerned with mismanagement and control of data, contemporary fears are linked with personal intrusion and data theft (Elahi 2009; Simpson 2011). This has been brought about by a technological shift in communication from multimedia messaging services (MMS) to Mobile Social Networking Applications (MSNAs) (Fang 2017). As Lessig suggests, 'the code, software and hardware that constitutes cyberspace, can either produce a place where freedom prevails, or one of oppressive control' (Lessig 1999).

In 2013 *The Guardian* newspaper (UK) published the first insight of leaked data from Edward Snowden, a former Central Intelligence Agency (CIA) employee, who exposed both American and British governments' involvement in surveillance practices through access to public telephone and internet records. Snowden revealed that information was obtained through telecommunications organisations in order to provide government agencies direct access to data servers owned by organisations such as Google, Apple, and Facebook. The full extent of this

surveillance demonstrated how both US and British intelligence could circumvent the online encryption provided to customers at a national level. Both the National Security Agency (NSA) in the United States and the General Communications Headquarters (GCHQ) in the United Kingdom had access to all phone calls and internet traffic being transmitted in and out of the country. Not only did this reveal the potential for large-scale communications tracking but also the acknowledgement that private organisations collaborated in sharing what was considered personal information with government agencies (Lyon 2014). The result of these revelations into data misuse triggered public apprehensions surrounding personal data, leading to growing fears of sharing data and a breakdown in trust with the organisations that shared it.

The Snowden files revealed how technological integration of computer networks and personal data had been appropriated and redefined within contemporary modes of communication. While this created new ways of perceiving the world, new technologies that create opportunities in one direction and have the opportunity of shaping the fabric of new social engagements, at the same time cannot be totally predictable or, as Furedi (2006) suggests, 'new technological hazards have given risk a boundless character' (Furedi 2006, p.16). As the *boundless* possibilities grow from recent developments there is unease about how the mechanisms of communication and information distribution will be controlled when it falls outside of the remit of any single government, corporation or institution. Furedi (2006) argues that technology and the anxieties over social change emerge where fears of change are that 'the outcome is not knowable' (p.16).

It is this technological shift from 'the knowable' production of systems, where there is a strong correlation between the mechanisms and the understanding of how a system works, to one where the system has become so complex that it is no longer feasible to predict the longer-term outcome of that system. The reliance on technology has begun to work with even larger data, termed as 'big data'; this is data that is so large it is not humanly computational, formed from large scale data which is accumulated and analysed from a variety of sources and formats, ' – from structured, numeric data in traditional databases to unstructured text documents, email, video, audio, stock ticker data, and financial transactions' (SAS Institute Inc 2017). Big data is data on the scale of a country's population and, in turn, this data is being aggregated, conjoined with other data to make new data (meta-data), the outcome of which is unknown. Snowden revealed that meta-data held by large corporations could be used as a form of surveillance, and subsequently introduced the concept of 'unknown' big data to a wider public audience (Schneier 2012).

Where personal data has been acquired and can be identified without the user's knowledge, it is clear that no agreement could have been made, and the process could be seen to infringe the user's rights by secondary data procurement. During a time in which government agencies, local authorities, and private businesses continue to positively emphasise the use of data surveillance in promoting anti-terrorism, security, and crime prevention measures, it was Snowden who introduced fears that personal information could be used to track individuals by organisations without their consent. Terms such as 'Dataveillance' (van Dijck 2014), and

'datafication' (Bertolucci 2013) highlight the proximity between 'data' and 'surveillance', and 'data' and 'identification', both of which project negative associations with sharing digital data as collections of personal information amassed through commoditisation. However, the terms and conditions for access to social media services supplied by companies such as Facebook often invoke the rights to secondary data as a condition of use (Roosendaal 2011; Milne & Culnan 2004).

Cho (2016) suggests that these anxieties are a consequence of increased personal information being co-owned and co-managed within SNS such as Facebook. Altheide (2013) supports this argument, suggesting it is the rise in mobile technologies, such as smart phones and social media as an application for surveillance that have increased levels of 'mediated social control' and promoted fear (Altheide 2013). Altheide (2013) identifies that the growth in communication technologies has expanded the range of surveillance beyond the realms of the super-Panopticon (Poster 1996), which is a technological solution for keeping us safe but has also become integral in 'preventing and constructing fear' (Altheide 2013, p.228).

The technology of the internet has created new forms of fear. Overuse of, and addiction to, online services have led to fears of stress and depression (Campbell et al. 2006), whereas the act of trolling in the form of deceptive and destructive behaviour, including personal bullying through online communication, has led to additional anxieties and fears (Buckels et al. 2014). Fears of technology itself has also led to online privacy fears. A recent study in the USA has identified 'the number one

privacy fear is that the government will use people's personal data against them in some way' (Worldgroup McCann 2014).

A consequence of sharing information with organisations and individuals online has been identified to cause context collapse (Marwick & Boyd 2011) which often leads to restricting access and boundary regulation (Lampinen, 2011). The issue of context collapse (Marwick & Boyd 2011) has been identified whereby private and public life is devolved and represented in a single online environment; this is the ability for multiple online encounters to overlap, which is equivalent to merging friends, family, and colleague relationships simultaneously. The issues surrounding privacy occur within SNS, as all individual encounters are identified as friends rather than addressing the complex relationship that occurs in real life, and 'these technologies make it difficult to distinguish between what is public and what is private' (Donath 2014, p.279). Boundary regulation (Lampinen, 2011; Wisniewski, 2012; Cho, 2016) is often the result of context collapse in which individuals use strategic withdrawal methods in order to protect personal privacy online. As a method of addressing context collapse, Cho (2016) suggests that individuals resort to boundary regulation as a way of corrective and preventative strategies in order to maintain control of personal information. Corrective and preventative coping strategies are often implemented when individuals lose control of shared information online. Users respond to this, and to the possibility of conflicts in social networks, by restricting access to both their online and offline lives. This is often undertaken by implementing security settings within SNS, deleting online content such as personal photographs, as well as adapting personal behaviour offline in order to protect

privacy online; an example of this is avoiding being photographed in order to circumvent being tagged and identified online (Lampinen et al. 2011).

Both Lampinen (2011) and Wisniewski (2012) point out that users manage personal boundaries when the audience of a SNS such as Facebook is unknown. They suggest this is to combat emotional distress and to maintain a level of self-disclosure to present them in a positive light. For many people, managing an online profile is perceived to provide greater control over the impression they are able to provide in an offline environment (Lampinen, 2011). Coping mechanisms affect how information is shared, resulting in negative consequences for personal online interactions. Lampinen et al. suggest that this 'can be defined by behavioural vs. mental, individual vs. collaborative, and preventative vs. corrective' coping mechanisms (Wisniewski et al. 2012). Previous research suggests boundary regulation (Lampinen 2011) is predicated upon a level of control and trust and represents an example of how '*coping strategies*' (Lampinen, 2011) are enacted.

Fang (2017) intimates that there is little empirical research in fear of data sharing in relation to personal encounters, specifically in social networks. Previous studies of technological fear concentrated on information security in relation to knowledge exchange, specifically in relation to conditions in the workplace (Fang 2017). Fear in this context relates to issues of exploitation, contributing to both losing face and losing power; as Fang (2017) suggests this form of fear derives from a perceived fear, 'that sharing knowledge may cause the loss of power' (Fang 2017, p.4). Boss (2015) similarly investigates fears of data loss using protection motivation theory. The

psychological study measured responses in pop-up screen messages relating to imminent virus alerts within anti-malware software, as 'individuals were presented with a very sudden, unexpected, and potentially catastrophic fear appeal threatening that all of their data might be lost' (Boss et al. 2015, p.51).

These fears are categorised within the table below, and are listed amongst the subset of technological fears from cyber-terrorism to misinformation. The table below (Table 2. Technological fears) demonstrates the complexities and divisions between these fears. An example of these manifested fears is cyber-terrorism (McCarthy 2016; Stohl 2006; Weimann 2005) that is often revealed through a level of technological fear that is often highly exaggerated. These fears are often elevated due to the amalgamation of two real-world anxieties, terrorism and technology. As Weimann (2005) states 'the fear of random, violent victimisation segues well with the distrust and outright fear of technology. An unknown threat is perceived as more threatening than a known threat ... the most destructive forces working against an understanding of the actual threat of cyber-terrorism are a fear of the unknown and a lack of information, or, worse, too much information' (Weimann 2005, p.131). It is the fear of the unknown, and the rise in too much information, that has shaped recent concerns over data sharing leading to an erosion of trust.

Table 2. Technological fears

Technological fears	Description	Authors
Computer anxiety	Fear of current & future computer use	(Stewart et al. 2002; Korzaan et al. 2009)
Data anxiety	Cloud solutions replace computer anxiety with fears of personal data loss	(Rubinstein & Sluis 2008; Boss et al. 2015)
Trolling	Online destructive behavior	(Buckels et al. 2014)
Cyber-Stalking, grooming, Cyber-bullying	The ability to track individuals movements online	(Future Journalism Project Media Lab 2011; Enisa 2011)
Cyberterrorism	Fears by large organisations of terrorist attempts to infiltrate and damage national infrastructures such as water, gas, and electrical supplies.	(Weimann 2005; Stohl 2006; McCarthy 2016)
Identity regulation & identify theft	Fears of personal identity theft in order to access personal information such as bank or business information	(Lopucki 2003; Marwick & Boyd 2011)
Spam, spyware, bot, and spiders	Fear of computer viruses and computer damage	(Gurung et al. 2009; Fehr et al. 2016)
Misinformation	Fear of false information such as news events	(World Economic Forum 2013; World Economic Forum & Boston Consulting Group 2012; Enisa 2011; Chaffee & Metzger 2001)
Privacy fears (also linked with trust)	Fear of intrusion into private life, e.g. issues such as context collapse as public and private information merges.	(Solove 2007; Such & Criado 2015; Dinev & Hart 2006; Steeves 2002; Thomas et al. 2010; Milne & Culnan 2004; Taipale 2004; Elahi 2009; Simpson 2011; Cho & Filippova 2016; Bergström 2015; Olivero & Lunt 2004; Worldgroup McCann 2014)
Privacy fears relating to wearable tech	Perceptions of privacy of sharing data from wearable devices.	(Motti & Caine 2009; Reading 2009; Nguyen et al. 2008)

2.14 Misinformation contributes to fears of data sharing

The shift between 'computer anxiety' (Korzaan et al. 2009; Stewart et al. 2002) and 'data anxiety' (Rubinstein & Sluis 2008) is made possible in part by a redefinition of personal data: as personal data migrates from private to public control and the link between the physical computer and digital communication has dissolved. This has been assisted by the integration of the personal computer, mobile phone, and digital camera into one device. In the interim state between analogue and digital, managing digital content was the responsibility of the individual, and data would be backed up to digital audio tape (DAT), Zip drives, compact disc (CD), and portable hard drives (HDD). 'Data anxiety' (Rubinstein & Sluis 2008; Boss et al. 2015) relates to the fears of losing personal photographs, data and other digital objects that was a problem that was ostensibly resolved with the introduction of cloud storage solutions. Rarely is there a requirement to log in to a device as the passwords to accounts are locked into the machine, hidden from view. All communication appears seamless, without walls or barriers, as it begins to mimic the physical space of synchronous communication.

The World Economic Forum (WEF) has identified how information can lead to global fears through dissemination of data through social networks. In 2013, the WEF warned of a 'global risk of massive digital misinformation, ranging from terrorism to cyber-attacks and the failure of global governance'. It continued to state how, through online systems, 'it is easy for misinformation in its various guises to spread like "digital wildfire", wreaking havoc in the real world' (World Economic Forum 2013).

Personal information plays a big role in the spreading of digital wildfires. However, we currently do not know enough about what constitutes personal information, nor do we understand the implications of how information sharing within social networks affects decisions made in the real world. While there are examples of the benefits of categorising shared data (e.g., the 'Google Flu Trends' project that aggregates search data to estimate flu activity, acting as an early warning system to a flu pandemic), the ubiquity of information, whether text, an image, or video, suggests that all information is public. Some have argued that once information is online, and 'once one has shared information, one has essentially lost control over it' (Mayer-Schonberger 2011, p.85). Social communication is designed to be one-to-one, or one-to-many, whereby the social networks sees communication as many-to-many, which causes discrepancy in the system as it breaks the relationship between the original interactions. The dangers and repercussions of wildfires can be drawn from the case of Hurricane Sandy, where the generation of misinformation spread across the Eastern Seaboard through the misuse of personal Twitter accounts:

As Hurricane Sandy battered New York in October 2012, an anonymous Twitter user tweeted that the New York Stock Exchange trading floor was flooded by three feet of water. Other Twitter users quickly corrected the false rumour, though not before it was reported on CNN. (World Economic Forum & Boston Consulting Group 2012)

The online content was not only restricted to text-based posts, as images began to

appear immediately after the hurricane was reported; many of the images posted satirised the online comments. Images recreated using film stills from the disaster movie *The Day After Tomorrow* showed the Statue of Liberty hit by tidal floodwaters as the storm surge battered the Manhattan skyline. The concerns raised by the World Economic Forum link the rise of misinformation, generated through social networks, to the dangers of false rumours affecting stock market prices that lead to digital wildfires (World Economic Forum 2013). Stock markets rely on news events to fulfil predictions for commodity trades and misinformation can have a direct effect on global economics. This, almost instantaneous, information is fed directly into other computers which trade on the news (Van Duyn 2007). Misinformation has the ability to spiral out of control as the latest systems not only rely on the news but also generate it. This is particularly pertinent in light of the fact that '72% of online adults get news online, and as of December 2009, 68% of online adults get news or information online that is specifically about politics' (Lenhart et al. 2010, p.29). The introduction of the superimposed image has the potential to add to the fear and panic within the local population.

The reason for the posting of a manipulated image during a time of crisis is not clear; internet trolling is one suggestion, in which individuals gain amusement from other people's misfortune. As Buckles *et al.* (2014) suggest: 'Much like the Joker, trolls operate as agents of chaos on the internet, exploiting "hot-button issues" to make users appear overly emotional or foolish in some manner. If an unfortunate person falls into their trap, trolling intensifies for further, merciless amusement' (p.1). In the case of Hurricane Sandy, the images posted during the natural disaster suggest more

a sense of irony and humour than one of maliciousness where the images appear to mimic the similarities of the Hollywood movie. Whether the original image was repurposed for either comedic or malicious purposes, the absence of the author creates a tension in understanding the combination of image and text that is being presented. In Jencks' words: 'Images become infinitely malleable once freed from their original context' (Jenks 1995, p.9) as the original text accompanying an image is often adapted, repackaged and reposted across the social networks.

In the example of the spoofed Hurricane Sandy imagery, subsequent viewers within the social networks frequently commented on the image as the message continued to gain momentum, while the meaning given to the image by the original post was discarded. As Rubinstein and Sluis (2008) suggest, 'within a photo-sharing platform, the viewing of photographs is now constructed as a creative pursuit, involving remixing, captioning and commenting upon images' (p. 18). An example of this loss of meaning can be seen in the tweets that link a single image to the hurricane devastation of Sandy in the attempt to create a narrative. A single film still from *Flooded McDonalds*, created in 2009 by the Danish artist collective *Superflex*, depicting a replica of a McDonald's restaurant slowly filling up with water was linked to a tweet stating that the McDonald's in Virginia Beach was flooded. In the context of the original tweet, there is an implied referential relationship between the image and the text; however, once the image was separated from the text and re-tweeted, it lost its original meaning. As Baudrillard (1983) suggests, 'Disneyland is presented as imaginary in order to make us believe that the rest is real' (p.12); so too the events that exist within social networks take on a similar, simulated existence.

During the events of Hurricane Sandy, the image from *Flooded McDonalds* was re-tweeted 1,112 times as participants on Twitter continued to question the authenticity of the image while reposting the photograph. In the subsequent tweets, the majority queried the quality of the image while others considered how the photograph could have been taken if the space was flooded. The nature of the questioning through the Twitter platform raised awareness and the condition of the hurricane in the attempt to make sense of the unfolding events, but did not quantify the nature of the original post as the original author was absent throughout the process.

The aggregation and distribution of unmediated digital content, or bricolage (Schonberger, 2011), causes information to become destabilised, becoming 'de- and re-contextualised within the control of the author' (Mayer-Schonberger, 2011). As Squicciarini et al. (2009) highlights in the case of sharing photographs online,

Pictures, or in the more general case data, are usually controlled and managed by single users who are not the actual or sole stakeholders, raising serious privacy concerns. Even when the stakeholders are aware of the fact that their data is posted and controlled by other users, they have limited control over it and cannot influence the privacy settings applied to this data (Squicciarini et al. 2009, p.521).

It is considered that once information is online, 'one has essentially lost control of it' (Mayer-Schonberger, 2011, p.85), the result of which has repercussions long after

the event. The system does not discriminate between speculative, factual, or malicious postings and continues to re-post according to the conditions of the environment, which identifies participants and sends out requests to engage. It is within the hidden algorithms of the social networks that comments and images posted indiscriminately in an environment, originally considered innocuous, create the potential for misinformation to spread. It is the social network participant who often is unaware of the dangers of a system that is predicated on the objective to build and connect as many individual profiles as possible.

Sharing photographs, liking things that friends publish, and adding comments on personal profile spaces in the example of Hurricane Sandy demonstrated a lack of awareness of the implications related to data security. However, there are growing fears relating to a lack of control and ownership of personal information. As users become more aware of how personal data is being aggregated and sold to third parties, there is an increasing withdrawal from using these services. This has led to a growing trend for virtual identity suicide in which users have removed themselves from online services. The Quit Facebook Day on May 31 2010, has also given rise to websites such as suppukoo.com and suicidemachine.org, which promote and automate the process of removing a user's online identity. Facebook reacted to this by issuing both companies with cease and desist notices claiming they infringe their terms and conditions by sharing passwords with a third party in the act of removing

a user's profile³. Identifying that the main reason for users wishing to remove an SNS account was 'privacy concerns' (48%), followed by a general dissatisfaction with the social networking website (14%), negative aspects regarding social network friends (13%) and the feeling of getting addicted to the social networking website (6%)' (Stieger et al. 2013). The instantaneous nature of sharing data has changed the perception of personal data; making information visible has the ability to empower individuals to understand processes and affect personal choices. However the ubiquity of sharing personal information challenges perceived levels of trust.

2.15 Conclusion

This study of the literature has identified there are tensions between sharing personal information and how it is controlled. The rise of personal technology has led to contradictions when personal data is shared. What has been acknowledged is that:

- There is a lack of awareness of what constitutes personal data.
- Users are willing to exchange personal information in return for online services.
- A perceived level of control and trust is based upon the type of data, and levels of self-disclosure between individuals.
- The more literate, the less trusting of online transactions.

³ Facebook does allow user profiles to be deactivated but does not remove completely the users account. Ironically the Facebook page 'How to permanently delete your Facebook account' has 10,992 members.

What has been identified is there is often a lack of awareness and indifference in the knowledge of what constitutes personal data that is based up the perceived ability to control personal information. The proliferation of lifelogging has created new outlets for personal data to be shared as well as levels of trust when data is shared. This can be seen across a multitude of data sharing practices from financial transactions to online communications in which familiarity has been demonstrated to encourage trust (Taddei & Contena 2013). It is this form of trust in online systems that promotes reciprocal trade in personal information in order to access online services and goods. The lack of fear is based upon the type of data and the level of self-disclosure between individuals.

However, the consequence of sharing personal information has led to cases of personal data leaks and thefts which have been recorded in the media. The revelation by Edward Snowden highlighted the scale of public surveillance using personal data and brought about a public awareness of how governments utilise personal information, such as online transactional data and mobile communications to amass information about the general public. What this has revealed is a fear of sharing as a consequence of privacy breaches. A recent example being Dropbox, the cloud storage company, who announced that 68 million customers passwords had been hacked in 2012 (Gibbs 2012) which led to concerns over continued data security. In addition, fears over context collapse (Marwick & Boyd 2011) have led to individuals becoming wary of sharing personal information online.

As Baudrillard (2010) identifies, 'we' have become hostages to the 'networked public sphere' described by Benkler (2006), in which fears have been identified in the guise of misinformation created by the automation of networked devices. The fears identified by the World Economic Forum have highlighted that data sharing has the ability to cause global fears through misinformation spreading across social networks. It is these global fears that are driven by the possibilities of machine events, which as Furedi (2006) suggests, are neither predictable nor calculable. With automation, there are new emergent concerns and fears and like any technology, such concerns are considered after the event.

Today, this revolution is social media. The example here is Facebook, an online business with over 1.2 billion users that sells advertising based on an aggregation of personal profiles, data and relationships through lives that are lived out online.

For many users of social networks, the production of information continues to represent a way of sharing life stories and events through freely available technologies. However, the networks have automatically begun to narrate our online lives through the connections that are made, through personal associations and who our associates know. The social media networks become an edited simulation of how the public wishes to be represented, through personal tagging and identification. What is shared online is increasingly in the control of the devices, networks and systems we encounter.

The consequence of sharing personal information has led to increased fears and greater awareness about sharing personal information online (Elahi 2009). The rise in identity theft, invasions of personal privacy and, in extreme cases, correlation attacks (Bohannon 2015), has shown there are many forms of data that can be linked and traced. The question raised here is whether users understand that social networks are designed for social engagement and generate knowledge that is commercially motivated (Bucher 2012). After the Snowden revelations, concerns and fears of sharing personal data focused upon personal information such as personal financial, communications data from mobile phone and internet providers. What has not been explored is how personal fears of data sharing are a consequence of not just what individuals publish but the 'datafication' (Bertolucci 2013) of combined personal data sources, such as photo and video content that is frequently shared through social media interactions.

3 Methodology

Research is intended to address problems. This may be stating the obvious, but I am not always sure that researchers understand this important fact.

(Creswell 2015, p.13)

The purpose of this chapter is to define the methodology I used within the practice-based projects of the Creative Exchange. A case study methodology was employed with each of the four projects I undertook. The research questions were defined and refined during the designing of, and participation in, the practice-based projects, and a mixed methods approach was used within each case study. The use of case studies, as opposed to any other methodology, was chosen as a way of binding each project as a specific entity that can be seen in isolation or collectively analysed. Mixed methods were used because they allowed for greater flexibility in responding to the research problems and questions. Each project had a unique proposition and relationship with multiple partners and academics, and the project themes varied between ranges of subjects. Projects were diverse, researching government planning policy, embedding digital content into physical objects and introducing interactive screens within art organisations. The projects also had specific time frames that created boundaries, lending themselves to the structure of case studies as a methodology.

This chapter begins by defining the relationship between my personal research perspective and the objectives of the Creative Exchange programme. This is followed

by defining case studies as well as the limitations and advantages of the methodology. Next, the methods used within each case study are discussed, following the mixed methods and practice-based approach within the framework of the bounded environment. The methods applied are described within the context of each case; this includes the use of structured and semi-structured interviews, observation, and visual research practices. The chapter concludes with an exploration of the methods of data analysis to be used for this thesis, including the use of Nvivo software as a coding tool.

3.1 Personal perspective

While I used a case study methodology and a mixed methods approach to data gathering, my ontological perspective drew from my previous experiences of visual discourse, which is closely aligned with symbolic interactionism (SI). The link between visual theory and SI draws comparisons with the new photography movement of the early 1970s (Berger 1972). To quote Berger's (1972) *Ways of Seeing*, a seminal text that introduced a paradigm shift on the way photography is perceived, suggests that 'we are always looking at the relation between things and ourselves' (Berger 1972, p.19). This approach has close relationships with Blumer (1969), who believed that individuals create social reality through collective and individual action (Morrione 1988). For example, Blumer state: 'Human beings act towards things on a basis of the meaning that the things have for them' (Blumer 1994, p.2).

By combining symbolic interactionism, semiotics and visual theory (Jenks 1995; Rose 2001; Berger 1972; Charon 1992), the relationship between interactions are based on the definition of the self, and the relation of the self to the objects one encounters. In this context, the methodological perspective is framed within the context of a philosophy as opposed to a method (Creswell) and, as both visual theories and SI suggest, all things are objects that change meaning depending how they are viewed. The implication is that while research projects are designed to be objective, all participation and interactions with objects associated with a specific research project changes perceptions through the lens of how they are encountered. Charon describes the relation between individuals as objects: 'when we act alone we usually engage in self-communication, when we are with others we engage in symbolic interaction, we give off meaning to others' (Charon 1992, p.57).

Based on this perspective, it was not possible to isolate a specific issue without considering the research environment in its entirety, whether this was through the complexity of space, or something linked but external that influenced the behavioural patterns of what was being investigated. In specific cases, the case studies were adapted to incorporate a range of research methods that cast a wider net around the topic area and to incorporate influencing aspects when considering what was being researched. This is in line with the mixed method approach that suggests it is 'common for the designs to emerge in a project rather than being pre-planned' (Creswell 2015, p.7).

3.2 Practice-based Research and the Creative Exchange

Being involved in practice was a key element of each project and subsequent case study. While case studies can be identified as the methodology I used for my PhD research, practice informed the research strategy of the Creative Exchange programme. The Creative Exchange challenged the traditional PhD structure as practice-based research was conducted during the early stages of the PhD process. Traditionally, research is undertaken after the research questions have been founded and when the literature and methodology has been established. The process of conducting PhD research begins with a topic and the formulation of a series of research questions in order to answer a research problem. This is followed by an extensive literature review to understand the research topic in-depth, which leads to a process of research design for the purpose of conducting research using specific methods. The difference between traditional PhD research and the practice-based projects within the Creative Exchange was that they were often initiated before and during the investigation of the literature review, and whilst my research questions were emerging. The programme initiated a range of research projects and invited researchers, academics, and creative sector partners to participate during the design of the projects through a series of creative labs.

The table below demonstrates the route in which PhD researchers were engaged in projects, how the project was initiated, and at what stage of the PhD they were invited to join.

Table 3 Creative Exchange (CX) project access

PROJECT	TIMESCALE	ACCESS TO PROJECT
Chattr	March 2013 (Future Everything) September 2013 (TodaysArt)	Invitation via FutureEverything (FE), via Drew Hemment director of FE, and lead PI, supervisor and academic from CX, and invitation from TodayArt organisers in the Hague.
Open Planning	January 2013 – October 2014 (project initiated before PhD students arrived)	Open call to creative partners. This project was initiated during the early stages of CX before student researchers arrived. Organised by CX.
Physical Playlist	June 2013- May 2014	Open call to interested partners to attend creative lab at Media City, Salford. Organised by CX.
TILO	June 2013 – October 2014	Invitation through department from academic partners and arts institution (FACT) to contribute to ongoing research project. Collaboration by CX, FACT, and NESTA funding body.

This process fostered a creative outlook and had a direct contribution to knowledge within the Creative Exchange, which can be attributed through a combination of design-led practice and a mixed methods approach to qualitative and quantitative research methods. It is the use of these methods that has influenced the research process and the outcomes as described within each case study (see chapter 4). As Niedderer (2007) has argued, the common issues that surround research within the creative industries are the uncertainties regarding the role of creative practices and the contribution to knowledge. The challenges in identifying how tacit knowledge, described as the process of knowledge exchange through non-verbal means or text based communication, is addressed and identified. For many of the projects,

individuals involved brought their own design skills and understanding of what constituted research and a range of methods. The Creative Exchange, as the title suggests, brought together individuals from a variety of creative disciplines and allowed the creative research processes to flourish. By engaging with external organisations and academic institutions, the exchange of knowledge was influenced by the hybrid environment that was established by the Creative Exchange.

The Creative Exchange brought practice to the fore, requiring an agile progression in the development of my research questions as the research proceeded. I applied to specific research projects based upon my earlier research at the Cornerhouse in Manchester (See Introduction 1.2) that investigated why visitors did not wish to engage in sharing personal information and the generation of fear. I selected specific projects based on the criteria where people and data would be exchanged. I was interested in the negative association of data sharing which led my research focus throughout my PhD to concentrate on non-participation. While other researchers were interested in participants' involvement within each project I focused upon those that obstructed, withheld information, and avoided contributing.

This was achieved through a practice-based approach, using the following range of mixed methods described within this chapter:

- Interviews and questionnaires (both qualitative and quantitative)
- Observation, diary and photo studies
- Wizard of Oz - prototyping
- Online studies
- Participatory design workshops

- Paper prototyping and 3D printing
- Time-lapse photography

The value of practice-based research is that it has the potential to address highly conceptual subject areas that are often conceived as problematic in a traditional research environment. Research that takes the nature of practice as its cultural focus is defined as 'practice-based'. This research methodology is associated with artists, designers and musicians who are practicing within a specific discipline. A practice-based approach also can be applied within any interactive, creative process as diverse as design and engineering (Candy 2013).

A practice-based approach also may have a reflective element to the study, as the process involved may have been based on previous works. The benefit of reflection is that the outcomes of less tangible subject areas create scope for new tools and design for knowledge exchange. Christopher Frayling's (1993) observations validate this practice-led approach: 'research is a practice, writing is a practice, doing science is a practice, doing design is a practice, making art is a practice.' He continues to argue that art research is no different from any other form of research, as 'the brain controls the hand, which informs the brain. To separate art and design from all other practices and to argue that they are alone in a different world is not only strange it might well be artecidel. (to use Stuart McDonalds words)' (Frayling 1993).

Jenks (1995) re-affirms this perspective when he states that method is not a servant to theory, it grounds it. Practice is depicted in the world as a 'coherent form' in line with the methods used (Jenks 1995, p.12). However, the view of practice is a polarised one, where opponents of practice-based research consider the subjective

nature of practice problematic in that the subject areas rely on perceptions and empathetic judgments in measuring the conceptual areas of research. With tactile and emotive subject areas, the researcher's empathy or perceptions of the subject could be seen to cloud the judgment of the research. The other issue surrounding the debate between practice and research is the distinction between producing works of practice and works that can be argued to be research. Cross suggests that which constitutes practice as research is when practice generates genuine knowledge exchange (Cross 2002).

3.3 Thesis structure

For my thesis, I have followed a non-linear process whereby the research design, data collection and literature has been in response to practice-based projects within the Creative Exchange, creating a fluidity to the process as each project evolves. The methodology that follows in this chapter has been adapted to display a more linear approach, but it is worth recognising that the use and timing of methods were not always linear within the case studies.

3.4 Challenges in conducting practice-based research

The challenge in conducting practice-based research involving multiple partners is identifying the problem itself (Creswell 2015). The aim of finding a solution to a problem is often bound within multiple agendas that, while bringing together new ways of thinking, also highlight different objectives. Both the outcome and the journey may hold different significance or value depending on those involved and the scope of the project. From a PhD researcher perspective, the objective is bound by the epistemological journey (Guba 1990) through the record of the design process

whilst appealing the remit of the original proposal. On other levels, the partners involved within the project may operate within a different timescale due to commercial pressures and bias which can have an impact on the outcomes. Each project can result in processes that are as diverse as the creation of a physical object or a toolkit for knowledge exchange. Within the scope of my thesis, the challenges within the practice-based approach to each project are depicted within each case study, and the process of evaluating the success of each project is highlighted by the comparison between the initial proposal and the outcome of the project.

3.5 Challenges and constraints within the Creative Exchange

The challenges for conducting practice-based research were specific to each project as these evolved from lab designs, and prototyping to artist's interventions. The projects were often constrained by a range of factors such as institutional ethical constraints or commercial timescales. This often resulted in changes to the initial project proposal or affected the methods used during the research. The following section describes a range of constraints that arose during each project.

3.5.1 Chattr

The Chattr project was inhibited by the ethical constraints set by Lancaster University. Chattr challenged the ethics of conducting research within higher education. While the lead artist of the initial project proposed to conduct research without informed consent, the University's ethics committee affected the project to the extent it had to be redesigned. This led to the lead artist Kyle McDonald withdrawing his interest in the research. The project continued without his presence despite being remodeled. Chattr was successful despite being originally perceived as

a constrained project due to being bound by the ethical position of the University. The results of the project after considerable redesign did not overtly affect the outcome of the project. This was achieved after careful reshaping of the project to accommodate the concerns of the University as the research took a more measured and calculated approach to individual concerns over data access. This supported both the University and the research outcomes. However, considerable preparatory design work had to be achieved to fulfil the ethics such as workflow diagrams to demonstrate how individuals would be cared for within the system, see Figure 39. Chattr flow diagram designed for FutureEverything.

3.5.2 Open Planning

Open Planning was constrained by the objectives of multiple partners consisting of Liverpool City Council; Liverpool University; Red Ninja (design agency); Engage Liverpool (community group); and the Creative Exchange. The initial design brief to 'investigate current limitations when engaging the public in the urban planning process and to improve transparency, public engagement, impact and communication' (see Open Planning 4.2.1) did not fulfil all the partners' requirements. Liverpool City Council showed little concern for local community engagement, and the initiation of an application design company did not show interest in the outcome of the research that revealed solutions which were not appropriate. Bringing multiple partners together revealed that a client-led process lost focus as the project had differing agendas and requirements that did not transition well with the academic research objectives. Within the project there were public, commercial, and research objectives competing for attention. The Council wanted a

solution to a problem, something tangible they could demonstrate to the public; whereas the application designers at Red Ninja considered the project from a commercial perspective; the Creative Exchange wanted to demonstrate its research agenda and involvement across private and public sector organisations, while the PhD researchers were addressing personal research objectives.

3.5.3 Physical Playlist

The Physical Playlist project had the fewest constraints because the project began with an established association between the Creative Exchange and BBC Research and Development. The advantage of an existing relationship with the BBC combined with a project designed during a creative lab event meant that the project grew out of a mutual interest in combining digital and physical environments. Digital Public Space was a concept that emerged from previous BBC lab events and the Physical Playlist combined the interests of the Creative Exchange and the BBC in to a single process. In addition, BBC Research and Development worked in a similar way to the Creative Exchange, through practice-based research, and therefore the objectives to investigate the concept of personal data embedded in physical objects was not a model that was unfamiliar to both partners. In establishing the project aims, initial meetings set out the direction of the project as well as identifying personal goals. Physical Playlist was the first to identify individual aims as well as addressing the project objectives. The only constraint was the request from the BBC that media content was obtained from the BBC collection. As a partner, they were interested to investigate how individuals would utilise content from BBC archives. However, a final

compromise was established that provided media from BBC iPlayer, alongside music and video content from Spotify and YouTube.

3.5.4 TILO

The research during the TILO project had to consider both the ongoing research that was being conducted by a separate research team and the reputation of FACT as an arts institution based in Liverpool. These created constraints around the type of methods that could be used as the earlier researchers had established and installed sensors and tools to monitor visitor movements within the public space. An outcome of these constraints involved liaisons with the project lead to establish the research that would be conducted on behalf of the Creative Exchange. In addition, the challenge for researchers was to also obtain permission from the FACT management and curatorial team when proposing interactions with visitors within the gallery space.

A proposal to use the public screens within the gallery space was submitted and discussed with the curators at FACT, this could not be implemented until the curatorial team approved it. The rationale for approval was based upon FACT's established position as a 'forward thinking all inclusive creative technology institution'⁴ in which the management team were careful to protect the organisations reputation and its ethical stance on interacting with visitors within the space. The research proposals were approved following a series of meeting between the curators, in which the types of questions that would be asked were agreed. The TILO project faced organisational constraints as FACT challenged the research

⁴ <http://www.fact.co.uk/about.aspx>

methods, and as the curatorial team did not wish to alienate the public or denigrate the reputation of the artists exhibiting within the same space in which the research was being conducted. Both the research and the exhibition had to co-exist within a safe environment.

Overall, the constraints of the research were more apparent when projects had multiple partners. Open Planning and TILO demonstrate the complexities of addressing individual and organisational needs. Whereas TILO and Chattr demonstrate how the ethics of working with artists and the public required consensual agreements. One identifiable issue was that while project outlines identified the aims of the project, they often did not consider the requirements of the individual partner within the project outline. Physical Playlist was the first project to identify personal objectives that had not been considered during previous project proposals. Physical Playlists success can be attributed to the supportive partnership and clear set of objectives.

While each project does not share the same subject area (see Chapter 4 Case studies for more details), the research aim was to investigate the experiences and fears of personal and collective data sharing. Fear is present throughout the projects in multiple guises; the fear of sharing personal data is a simple concept although, once bound within the context of a series of projects, the knowledge of why fear is present becomes apparent and complex. It is the use of case studies that allow these projects to be collectively addressed as well as interrogated individually.

3.6 Case studies: Definitions

Case study research excels at bringing us to an understanding of a complex issue or object and can extend experience or add strength to what is already known through previous research. (Taylor et al. 2006, p.25)

A case can be defined as an individual object, a person, and a group of people such as a family or even a group of work colleagues. A case study is therefore the investigation of a series of cases that are reviewed based on the evidence that is defined and based on an investigation or study as the outcome of a specific research question (Yin 2004; Stake 1994; Creswell 2007).

The researcher creates a framework by identifying a research topic and, within that, a series of research questions that rely on the focus of a specific study to address. The researcher engages with a particular study using a series of data gathering methods to investigate the subject in depth. The case study is the result of the evaluation and analysis obtained from the data gathering exercise. The case study is bounded by the parameters of the initial framework of the study. While the case can be used as the final report, it is often a method of containing the study and can be 'the focus of interest in its own right', which can be commented on and revised (Bryman 2008, p.53).

The initial steps in case study research are the definition of the object or subject being studied. This is followed with the process of defining the research questions, usually defined by a series of 'how' or 'why' questions that fulfil a series of relational questions that link the researcher's literature to the subject being studied. The

process of collecting data is often seen as one of the strengths of the case study methodology, as this involves the ability to use multiple data gathering techniques or mixed methods. The data collection process is predominantly qualitative but also can be quantitative, and often a combination of both qualitative and quantitative data is presented that allows data to be considered from multiple sources. Analysing the types of data obtained from multiple sources relies on a range of analytical tools. While multiple sources of information create robustness for the research, the ability to access and interpret the range of data can be problematic. The researcher is required to have a good knowledge and ability to be able to analyse quantitative and qualitative data. The form of this data can be as diverse as a photographic image or numeric data from a questionnaire.

3.7 Case studies: Advantages

The main advantage of case studies is that, although they may appear ambiguous due to their lack of definition compared with a laboratory experiment, they have flexibility. The ability for mixed research methods to be used across individual case studies creates a fluid approach to data collection and analysis. This creates a structure in which, through a process of inductive reasoning, multiple cases can be queried and conceptual ideas can emerge from the data. Another advantage of case studies is their clear boundary. From Creswell (2007):

The advantage of a case is when there is a clear and definable boundary that can be studied. The definition of the boundaries, or 'bounded system' are

often restrained by 'time and place' ... 'it also has interrelated parts that form a whole' (p.244).

In summarising the path of case study research, I will be following Creswell's (2007) definition in which case study research follows 'a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded system (cases) over time through detailed, in-depth data collection involving multiple sources of information (e.g. observations, interviews, audio visual material and documents and reports', (Creswell 2007, p.73).

3.8 Case studies: Limitations

The case study relies on the relationship between cases where the variables can be quantified to show a pattern within the data. The process of examining and interpreting raw data to create linkages through a series of research questions is what defines a case study methodology (Yin 1984, p.23). In the following quotes about case studies by Yin (2003) and Stake (1994), it is evident that there are clear similarities while ambiguity remains:

A case may be simple or complex. It may be a child or a classroom of children [...] In any given study, we will concentrate on the one. The time we may spend concentrating our enquiry on the one may be long or short, but while we so concentrate, we are engaged in case study (Stake 1994, p.236).

The case study method allows investigators to retain the holistic and meaningful characteristics of real life events such as individual life cycles,

organisational and managerial processes, neighbourhood change, international relations and the maturation of industries (Yin 2004, p.2).

While Stake and Yin have defined in their own terms to describe what constitutes a case, Cambell and Stanley (as cited in Thomas, 2011) suggest that 'case studies have such a total absence of control as to be of almost not scientific value' (Thomas 2011, p.9). Yin (2004) argues there are ambiguities in the defining of what constitutes a case and suggests that there is currently no 'catalog' of research design (Yin 2004, p.19). To resolve this he has called for clearer guidelines. Positivists may see the merit of the case study methodology, as it follows a natural sciences perspective with an emphasis on using experimental methods of inquiry and deductive theories to test a hypothesis from an objective perspective that bases its reasoning on a viewpoint that everything can be scientifically measured. In contrast, non-positivists (e.g., constructivists) would have a different viewpoint: case studies take a more subjective view of the world, follow a participatory approach to understanding a phenomenon and use qualitative data to analyse a research problem. Ambiguity is part of the process, rather than something to be removed from it. The case study approach within this thesis will follow the latter: the research conducted within each case study was approached from a participatory perspective through practice-based methods (Lincoln 1990, p.67).

3.9 Research methods: mixed methods

According to Creswell (2015), mixed methods are defined as:

An approach to research in the social, behavioral, and health sciences in which the investigator gathers both quantitative (closed-ended) and qualitative (open-ended) data, integrates the two, and then draws interpretation based on the combined strengths of both sets of data to understand the research problem'. (Creswell 2015, p.2)

Creswell defines mixed methods as a method, rather than a methodology, and in this context, it creates a close association within the case study methodology. The debate surrounding the issue of combining both qualitative and quantitative research is embodied in the ontological argument that it is not possible to consider both positivist and constructivist paradigms collectively; rather the choice as to which method to use is intrinsically rooted within the process of data collection itself. Bryman (2008, p.605) suggests that although there is an argument that both research strategies cannot share the same ontological perspective, there is a practical argument for using mixed methods: the potential outcomes could lead to 'superior findings' as combining research methods can enhance output and opportunities through the process of triangulation (Bryman 2008, pp.605–611).

Within the structure of the practice-based projects lies a series of research problems that allow a combination of research methods to be designed and the outcomes triangulated (see 3.11, Triangulation of data from mixed methods). The data

obtained from a mixed method approach is integrated during the qualitative and quantitative processes as the data intersects. The sampling during a series of research processes creates either a mixed approach where the data is dissolved or remains independent (Creswell 2015, p.82).

3.10 Qualitative and quantitative research

The principle aim of qualitative research is to 'seek an understanding of social reality' (Bryman 2008, p.365) which is obtained through a process of experience and shared through methods such as observation and participation. The data collected from the researcher's understanding of the subject or environment is often a collection of texts and documents, which may be as diverse as audio files or photographs of which specific coding mechanisms are devised.

Quantitative research involves a more scientific approach and has an objective perspective on the view of social reality. An ontological, positivist perspective supposes that through scientific discovery, the true nature of reality can be explained (Guba 1990, p.19). The challenge for researchers using a mixed methods approach is in describing the use of both quantitative and qualitative methods to obtain a single ontological perspective.

3.11 Triangulation of data from mixed methods

Triangulation is the process of using 'more than one method or source of data in the study of a social phenomenon so that findings may be cross checked' (Bryman 2008, p.700). The purpose of triangulation is to corroborate findings from both qualitative and quantitative methods (p.609). The perspective that individual methods have specific strengths and that combining them 'offsets their weaknesses' (p.609) implies

that triangulation is both a process of equalising and balancing both qualitative and quantitative results. However, triangulation is a process that can be applied at different stages of the research. Triangulation can be applied at the design stage, during the research or during analysis. The process of triangulation can be used in a variety of ways: to illustrate quantitative findings with the use of qualitative data, to reflect the process of the research, and produce completeness by applying a comprehensive level of methods to a process (Bryman, 2008: 609).

For my PhD thesis, each case study was reliant on a series of mixed methods that included face-to-face interviews, focus groups, co-design workshops, photo studies, observational research and video production. Each method was selected for its appropriateness to the study and analysis, and could be cross-checked to triangulate the findings. The purpose of triangulation in this context was designed to add comprehensiveness during the analysis process, in order to present a holistic explanation from two different qualitative and quantitative research perspectives.

Table 4 demonstrates the relationship between each case, the methods used, the data obtained as a means of triangulating the results and the type of analysis used to provide a wider understanding of the research topic and answer the research questions. The following sections outline the mixed methods I used in my case studies, and includes examples of how I implemented methods within the practice-base projects.

Table 4. A mixed methods approach showing each case study, the methods used, the data collected and the approach to data analysis.

Case study/Project	Method	Data	Analysis
Chattr	Interview	Qualitative/quantitative responses	Content Analysis
	Observation	Photography	
	HCI (Human Computer Interaction) 'Wizard of Oz' prototyping	Observation/photography	
	Online	Tweets/text	
Open Planning	Participatory design workshops	Observation/photography/objects	Content Analysis
	Observation	Photographs/video	
	Prototyping	Photographs/objects	
TILO	Interviews & Questionnaire	Transcripts Quantitative/qualitative responses	Content/ Discourse Analysis
	Time-lapse photography	QuickTime video	
	HCI (Human Computer Interaction) 'Wizard of Oz' prototyping	Observational transcript	
	Observation	Photography/text	
Physical Playlist	Questionnaire	Transcripts	Content Analysis
	Observation	Photography/text	
	Prototyping	Object	
	Photo study	Photography	
	Observation	Photography/text	

3.12 Mixed methods: Qualitative interviews

A qualitative interview is defined by combining both structured and semi-structured interview processes (Rubin & Rubin 2002; Bryman 2008). A structured interview is designed to ask the same question to multiple participants over the duration of the research process. The researcher controls the questions asked in order to achieve a reliable response during the interviews. One main advantage of structured interviews is that it is less likely to create a deviation from the research subject, although it does not allow for serendipity and variations in the questions to emerge. A semi-structured interview may follow a guide or subject area that will initiate a series of topics, but will not follow a specific set of questions in the way a structured interview would follow. The main advantage of using semi-structured interviews is that they create a platform for alternative themes to emerge during the interview. However, this process can be difficult to code and analyse over many interviews as interviewees may not be answering the same question.

Unstructured interviews were not used because of the transient location in which the research was conducted, which was not conducive to allow for longer dialogue to take place. Interviews conducted within each case study comprised both structured and semi-structured formats. Interviews usually began with a structured interview format that used closed questions (i.e. yes or no, where the closed question was designed to limit the response to a single variable) to obtain quantitative research data. This format led to a semi-structured, secondary set of open questions (i.e. an open question allowed the respondent to reply in a way that they felt appropriate) that were informed by the responses from the initial,

structured questions. The purpose of the closed questions in the structured format was to create a controlled and bounded picture of the research participants' habits; the purpose of the open questions in the semi-structured format was to create a platform for the participant to respond to the answers of the closed questions.

An example of the use of qualitative interviews is within the Chattr project. The aims of my research on Chattr⁵ were to investigate the behavioural changes of visitors who physically entered the project space and how they attempted to subvert the space by altering their behaviour and language. The focus and interest for the practice-based project was to investigate visitors' perceptions and concerns about being recorded and broadcast; and visitors were questioned about their reluctance to enter and participate and be recorded outside of the space.

During the planning stages of the Chattr project, a quantitative questionnaire was devised to identify users' online habits; the questionnaire was later amended to incorporate multiple-choice responses into further qualitative questions. The qualitative format identified specific categories that would define the users' online social habits, how they conversed online and the types of content they shared and with whom they were willing to share. Using a qualitative interview method, which combined both qualitative and quantitative questions, the participants' responses to the interview process was often one of surprise when the data to the closed questions was repurposed in the form of an open question. An example of this is the

⁵ The Case Study chapter following Methodology discusses the Chattr project in greater detail. For the purposes of this chapter, a brief example is used.

case of a participant that was concerned with sharing personal information in a physical space but, when asked about his/her online habits, shared the same information in a similar online environment but had not considered the implications of the latter. The interview data, using a qualitative interview method, had allowed the research to explore the fears of the digital public space using a mixed methods qualitative process.

3.13 Literature review

The focus of the literature for the PhD thesis concentrates on the subject of fear of sharing personal data as the main topic, with references to subtopics including privacy, data sharing, computer security, networked mobile technologies, and social behaviour. Within each project, the literature is used to emphasise and support both a technical and literary depiction of the subject area. The reference to contemporary fiction, combined with academic texts, film, and popular culture are used to reflect the relationship between the subject and the responses provided during the research.

3.13.1 Literature: Example

In the case of Open Planning, the UK Government white paper on the current Planning Policy Framework was cited as the basis of understanding the current issues surrounding planning policy. However, the academic literature on space and place was used to understand how cities can empower citizens to shape the space around them. The work of Foucault (*Other Spaces*, 1984), Lefebvre (*The production of space*, 1974), Hosokawa (*The Walkman Effect*, 1984) and Harvey (*Between Space and Time*,

1990), to name a few, were used to critically reflect on the way public space is interpreted.

In the Walkman Effect (Hosokawa 1984), Hosokawa considers the introduction in 1981 of the Sony Walkman and argues that the introduction of technology creates is a disconnection between the self and the reality of the city (p.171); It is these considerations that have an impact on the design of the research and the relationship with the participants during the study.

An example where the influence of popular literature in the design of practice-based research methods can be demonstrated was the intervention at FACT in Liverpool in which the design team implied that the screen technology was intelligent. The process of implied intelligence was created using a process of pushing messages to the screen based upon observational responses within the physical space. The design of the interface and the language used was based upon science fiction references of perceived artificial intelligence such as HAL from 2001 by Arthur C. Clarke and the fears of the Great Oz from *The Wizard of Oz* by L. Frank Baum to the fear of surveillance within the work of George Orwell's *Nineteen Eighty-Four* to the social conditioning of Aldus Huxley's *Brave New World*.

The research design was underpinned by hidden references that were reflected in the research outcomes of the interview data. The interviews conducted during the screen interventions demonstrated visitors' responses to how they understand the world around them, and this has been reflected through the research methods. The

term 'big brother' was cited 10 times in 6 transcripts, while '1984' was seen twice, and 'Orwell' once despite the terms having no relation to the interview questions. The outcome of deep routed fear and concerns that were witnessed during the responses during the interview process can be attributed to how fiction, devised through the research methodology, influences the behaviour of visitors.

3.14 Photography: Visual analysis and time-lapse imagery

Photography was used as a research method to record an object, process, or action. This form of recording is designed as an exploratory method of understanding the 'world of users' (Martin & Hanington 2012) in the process of documenting the interactions and behavioural patterns of participants within a specific study (see Figure 23 Snapshots of user activity at 28 tables, FACT café, Liverpool. and Figure 24. Time-lapse photography taken at FACT, Liverpool documenting user access and movement). There is a suggestion that all photographers are intrinsically positivistic in their approach to research: 'for the positivist, photography represented a privileged means for understanding the "truth" about the world' (Robins 2005, p.34). In the context of my case study research, I have used photography and photographs as a recording or observational tool, rather than one of traditional documentary, or aesthetic representation.

3.14.1 Photography: Example

During the TILO research project, which was instrumental in investigating the interactions with screen-based technology within the public arts organisation at FACT in Liverpool, it was not possible to research the visitor experience without considering the complexities of the space. Thus, the research took into consideration

the relationship between the public, the space and FACT as the organisation that manages the space, gallery, café, and cinema complex. In the study of the space, the café and main concourse was observed as it was considered to affect the visitor experience. In the study of the public, the research focus was the engagement of visitors with the screen technologies. Therefore, the engagement of the services and the public within that space were critical factors in understanding what happened at FACT. By introducing a series of photographic methods (e.g. photographs, QuickTime video), the study recorded visitor behaviour and movement. Interviews also were critical in this mixed methods case study (See 4.4.2 TILO research methods). Figure 24 in the same study demonstrates an attempt to remain passive in observing and recording a space. The use of time-lapse photography can be viewed as an 'unobtrusive measure' (Bryman 2008, p.309) in the recording of a space. Installing a semi-hidden camera in the space allowed me to record movement without participants adapting their behaviour in response to seeing the hardware. The use of time-lapse processes documented the space in which a photograph was taken every 4 seconds and later compiled to create a video sequence that could be played back to reveal the movement of visitors over the course of a day. The result reduced the day into approximately nine minutes of movie time.

As objects, the photograph and the time-lapse film possess both quantitative and qualitative attributes: that is, people and objects in the images may be counted and/or described in order to answer research questions. Whether or not the meta-data contained within these objects are retained or discarded will be based on the notion of the 'logic linking the data' (Yin 2004) and how it will be reused in the process of triangulation.

3.15 Non-participant observation

The use of non-participation observation as a method was used within 50% of projects. Non-participation, in which the researcher does not actively get involved, was considered to be appropriate in understanding the space during each study. The process requires detailed recording of people, including behavioural interactions, in order to catalogue the environment being researched (Martin & Hanington 2012, p.120). Photographic methods were used in specific instances where observation could not be accomplished over a longer timeframe and concern over the introduction of recording equipment within the space was paramount in order to document it without altering the environment. In the case of TILO, the study of FACT in Liverpool incorporated the gallery, café, and cinema space; it was crucial in describing the complex environment as naturally as possible. Non-participation was used as a method to record the movement of visitors without manipulating the space; the aim was to avoid what is described as the Hawthorne Effect, in which workers at the Hawthorne Electric Works in the 1950's were aware of being monitored as part of a research process and changed their behaviour which, in turn, had a profound impact on productivity within the factory (Martin & Hanington 2012, p.90). The presence of researchers and recording devices (including audio Dictaphones, cameras, tablet technology) within each project environment was acknowledged for the potential impact it would have the environment being studied. This was taken into consideration during the design and analysis stages. An example of this is the observations made during the early stages of the TILO project (See 4.4.2 TILO research methods).

3.16 Analysis

The purpose of analysing field notes, transcripts, photographs and interview data is to find meaning from patterns within the research. Deciphering a wide range of data can be a baffling process (Lofland, 1971: 18) in which it can be difficult to assemble meaning on a specific topic. Lofland suggests a four step approach in which the first step is to 'self-consciously assemble all the material' (1), followed by 'teasing out the variations' (2), 'classify them into sets' (3), before 'presenting them in some ordered named and numbered way' (4) (Lofland, 1971:18). This process relates directly to the original research topic and reinforces the process of answering the 'how', 'what' and 'why' within research questions.

3.17 Nvivo as an analytical tool

The use of Nvivo, an analytical tool for qualitative analysis, was instrumental in the analysis of the data from each case study (see Figure 4). The purpose of the Nvivo software is to identify patterns, which I used together with the interview responses from each case study. The pattern matching ability allows users to query a bulk of text and return popular terms based on frequency. From this initial work, I was able to code and categorise the data to identify themes or patterns. Automatic coding generated rapid outlines that supported the early identification of themes, however machine processes could not identify the subtleties and inferences within conversations, such as irony or something said in jest. Although the software was able to filter and organise a proportion of the data, I was required to make the connection between data and meaning. To do this, I referenced the research topic of

each practice-based project as well as my own research questions for each case study and for the PhD thesis as a whole.

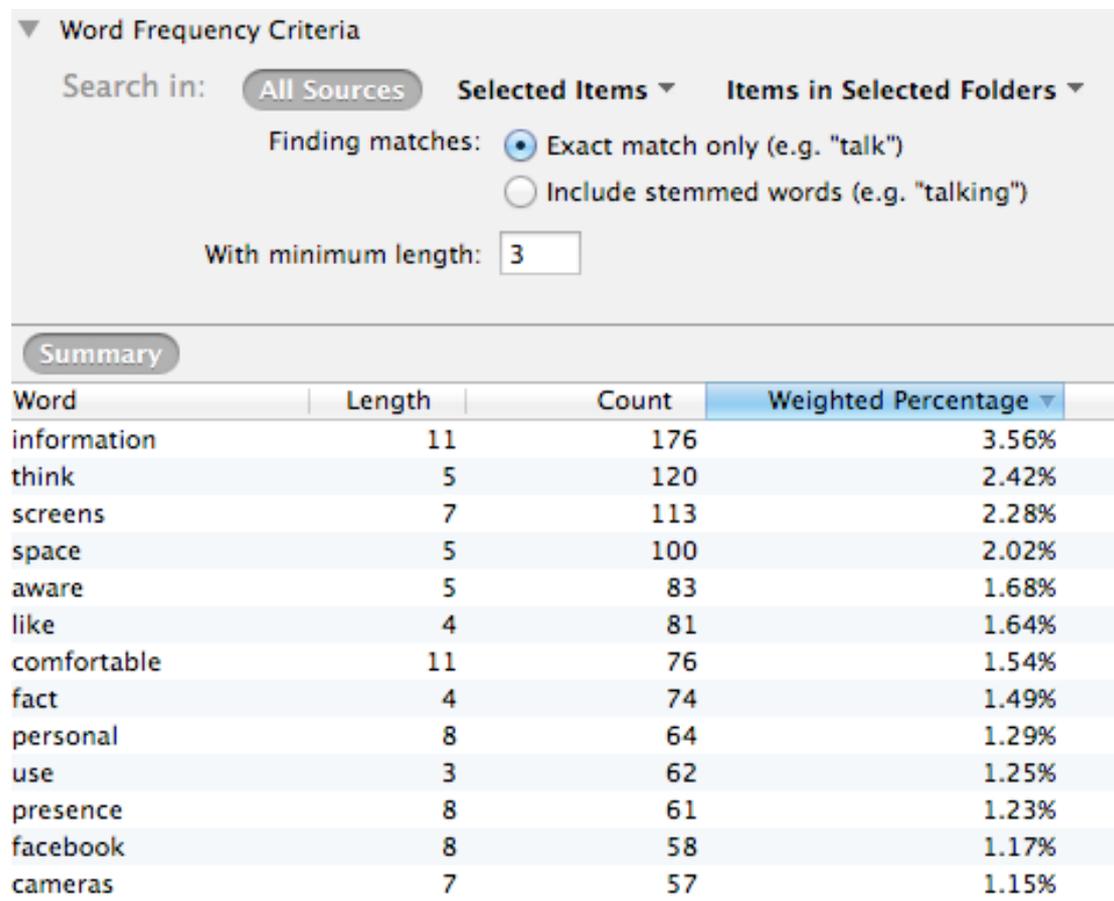


Figure 4. Frequencies of words used in the analysis of Interview data for the TILO project.

In addition to filtering and organising the data, Nvivo provided levels of pattern matching that could not be done by hand alone. By importing interview data, the ability to output regular expressions and word frequencies offered a useful tool for understanding language patterns during the analysis stages. The software also supported the ability to match similarities across multiple projects.

Specific questions can be assessed based on a single word. In the instance of the TILO face-to-face interviews, a single question can be highlighted and the respective responses can be seen in the context of an individual participant. The example in Figure 5 demonstrates similarities in response to the same question through the use of conjoined language choices.

Nvivo was also instrumental in building nested word tree structures (Figure 5), which create a visual representation of all the collective responses to a specific question or a single instance by word association. By harvesting all the responses in one place, the analysis can show a representation of how each participant has reacted to a specific question.

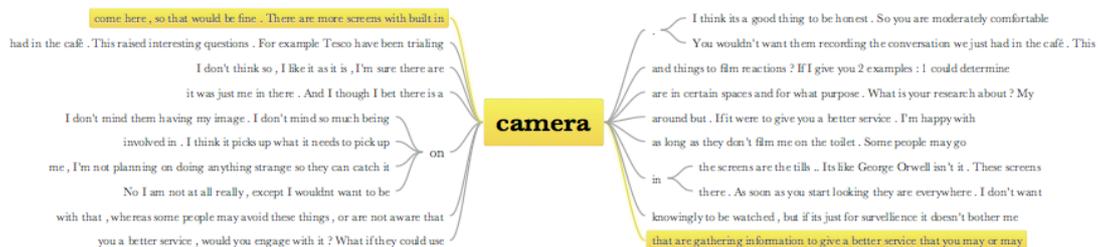


Figure 5. Nested tree structure in Nvivo

3.18 Coding and nodes

I coded the text using keywords that were relevant to my PhD research. The example of using transcribed conversational data in figures 4 and 5 demonstrate that each document can be coded using software to reveal patterns within the data. These words or phrases created a series of nodes, which are markers that are wrapped around a segment of text. Nodes can be reused to join similar text from the same document or other documents that have a similar subject. The purpose of the nodes

is to create a series of linked markers that can be brought together that can be recalled in the analysis stage to demonstrate the relationships within the original documents.

The ability to 'enhance the transparency of the process of conducting qualitative data analysis' (Bryman 2008, p.567) is one of the reasons for the introduction of an analytics tool as it is often not clear where to start the analysis of interview data. Where individual statements are often seen in context of a linear process, the ability to dig into a series of data objects in a non-linear way allows for new creative possibilities for report writing and analysis. The opportunity to structure data/text in a different way also lends robustness to the data analysis process.

An example of coding time-lapse images taken from the TILO project can be coded to indicate the movement of visitors within the space using quantitative reasoning. Each image was viewed and a number sequence is used to identify what was happening within the space over a period of time. For example, a value of 1 indicates an individual, 2 for a couple, 3 for a group, 4 for some running and 5 for someone with a walking stick. By creating a grid that corresponds to the time of day, a visual data map can be created to reflect in a graphical format the type of visitor to the space.

3.19 Content and discourse analysis

I used content analysis to transcribe conversation, images, processes, and text. However, a discourse analysis approach was applied as described by Hardy et al.

(2004) as they can be used complementarily despite the polarity that defines them (see Table 5). The positivistic values of content analysis suggests that measurement comes from statistical analysis, abstracted from its environment, whilst discourse analysis embraces a constructivist perspective which suggests that reality is constructed through 'meaningful interactions' (Hardy et al. 2004). The use of open coding techniques allowed themes to emerge, whilst coded variables created an order to the text, which identified frequencies of specific keywords and phrases. The combination of approaches additionally took into consideration the physical environment in which the interview took place, photographs and video footage, as well as observational data, which complimented the study. As Table 5 below demonstrates the combination of content and discourse analysis produce a complimentary mixed methods approach.

Table 5. Using Content Analysis within a Discourse Analytic Approach (Hardy 2004)

Dealing with Meaning	There is no inherent meaning in the text; meanings are constructed in a particular context; and the author, consumer, and researcher all play a role. There is no way to separate meaning from context and any attempt to count must deal with the precarious nature of meaning.
Dealing with Categories	Categories emerge from the data. However, existing empirical research and theoretical work provide ideas for what to look for and the research question provides an initial simple frame.
Dealing with Technique	The categories that emerge from the data allow for coding schemes involving counting occurrences of meanings in the text. Analysis is an interactive process of working back and forth between the texts and the categories.
Dealing with	The analysis must locate the meaning of the text in relation to a

Context	social context and to other texts and discourses.
Dealing with Reliability	The results are reliable to the degree that they are understandable and plausible to others i.e. does the researcher explain how s/he came up with the analysis in a way that the reader can make sense of?
Dealing with Validity	The results are valid to the degree that they show how patterns in the meaning of texts are constitutive of reality.
Dealing with Reflexivity	To what extent does the analysis take into account the role that the author plays in making meaning? Does the analysis show different ways in which this meaning might be consumed? Is the analysis sensitive to the way the patterns are identified and explained?

The analysis of language revealed how fears that affect both the physical and digital space impacted an individual's attitude to personal and socially constructed realities. Through a series of interviews across each project, conversations were transcribed and coded to investigate how the social construction of a digital environment was perceived.

This process highlighted the position between person and place and how the changing physical space impacted personal perceptions. In the example of the TILO project this was most apparent when participants were asked a series of questions that addressed the relationship between personal and private information. Responses to the issue of surveillance within the space returned terms such as 'Big Brother', and '1984', which suggested the issue of being observed and recorded was omnipresent in the minds of the participants. In this context, discourse analysis was implemented as it allowed the result of the many interviews to be explored through the meaning of semantics. This meant that the language used was considered in

context to the surroundings perceived by the participant. Alternatively, during the analysis of photographic data, content analysis was used to probe a series of images and to make meaning from the array of visual information. In the context of a photographic image, codes were defined for the purpose of understanding how participants interpreted the environment. This could later be reduced to a series of quantitative values and tested using statistical processes (Hardy et al. 2004). While content analysis is approached from a positivistic perspective, it was used to support the outcomes of the mixed methods approach.

3.20 Conclusion

The complexity of undertaking multiple projects within the Creative Exchange for my PhD benefits from a flexible model of research and analysis. On reflection, a bounded case study methodology in which data is obtained through practice-based projects, with the ability to reflect simultaneously on a series of cases during the analysis stage, was invaluable.

Each project presented different challenges in the assimilation of data due to the diverse nature of the projects. The Chattr and TILO projects were designed to provoke individual responses to public perceptions of surveillance, social networks, personal data sharing, and by what means information can be re-purposed. Chattr and TILO were constructed around aspects of science fiction, storytelling, and hearsay that drew upon public anxieties and fallacies; whereas Open Planning observed the relationship between Liverpool City Council's Planning Department, local communities and their relationship with sharing data between planning systems; Physical Playlist studied how digital content is shared by embedding digital

content into physical objects and recording the relationship between individuals, digital content, and personalised physical objects. While each project can be defined as a separate entity, the outcomes of each project relate to varying mechanisms of control. Interview data from each project was free coded and categorised using the initial terms: Acceptance, Perception and Control. All responses were given anonymous identifiers, such as TILO #value to denote an individual that was interviewed.

As an example of how this process worked, the Chattr project created an environment that emulated the terms and conditions of social networks, and the research explored the issues of privacy and the complexities of the terms of service of social spaces online. By recording, transcribing and broadcasting all that was spoken within the physical environment in exchange for comfortable seating and free coffee, Chattr evaluated people's reactions within the space as well as a reluctance to engage. The research methods were developed through a series of practice-based projects in order to initiate public reaction to traditional forms of surveillance. These ranged from investigating public perception of CCTV cameras to other more indirect questions that relate to self-disclosure and the use of portable technologies such as mobile phones, lifelogging devices, loyalty cards, and other forms of data capture. All of these technologies have implications for the way individuals understand their relationship between the physical and digital environment and their ability to control it. Interview methods were designed to query patterns within existing social networks through the use of supermarket loyalty schemes, and personal data sharing habits.

These methods continued during TILO, whereby the research instigated interview methods to ascertain how visitors perceived the organisation. This was performed in parallel whilst creating an environment that suggested the building at FACT was intelligent and the surveillance systems could read the visitors' digital footprint. TILO challenged visitors' understanding of technology while at the same time questioned visitors' willingness to interact. In this study, visitors were interviewed initially without the interactive TILO screens installed, and then again with the screens in situ. By suggesting that the screens were intelligent, the research process adopted *The Wizard of Oz* technique devised by John F. Kelley for the development of natural language programming (Kelley 1984). The technique is intended to imply that the participant is interacting with a computer but is engaging with a human being. This process was first used during Chattr and subsequently used again during the TILO study. In the TILO case, the research implied the computer systems behind the technology were autonomous whereas researchers placed messages on the screens manually in order to engage with visitors' behaviour patterns and responses. Physical Playlist presented participants with physical objects that could be embedded with digital content. By portraying the object as a new method for sharing digital information, participants were invited to reveal their present sharing habits and to identify with whom they would share in future if they had access to the physical playlist technology. Through these processes, I was able to be flexible, changing and accommodating a mixed methods approach as and when needed.

4 Case studies

This chapter presents the case studies of four projects conducted between October 2012 and July 2015. Each case reveals how the public responds to the concerns over shared personal data that have been instrumental in the pursuit of gaining a deeper understanding of the public perception of personal fears and concerns.

Each project involved a lead academic who acted as the project's Principle Investigator (PI) and included one or more PhD students from the Creative Exchange programme from Lancaster, Newcastle, and London. In addition, each project included one or more external partners from organisations external to Lancaster University. Each project was designed around a central proposition established prior to the start of each study and agreed in collaboration with the external partner with funding for 3-6 months. Each project used a mixed methods approach, see Table 4 in the previous Methodology chapter, that illustrates the diversity of methods adopted during each study, many of which gathered a combination of both qualitative and quantitative data that were later triangulated.

The following description offers a synopsis of each project and its relationship to my research:

Chattr

PI: Drew Hemment, University of Dundee (initially Lancaster University)

Partners: Kimchi and Chips (including Kyle McDonald); FutureEverything (Manchester); Mel Woods, Dundee University

Research PhD: Ben Dalton, Joel Porter, Lara Salinas

Chattr invited users to interact within the social space in return for the right to record, transcribe and make public all conversations that have taken place within the Chattr lounge. Initially piloted at FutureEverything in March 2013 and performed again at Today's Art in The Hague September 2013, the work was an investigation into the ethical use of personal data and a play on the terms and conditions of the social network. The perspective of social media suggests the aesthetics of the online space creates a framework for constructing a controllable, personal environment.

Open Planning

PI: Richard Koeck, University of Liverpool

Partners: Liverpool Vision; Red Ninja (Liverpool); Erin Walsh

Research PhD: Dan Burnett, Joel Porter, Lara Salinas, Sebastian Weise

Open Planning was an investigation of current limitations when engaging the public in the urban planning process, working with Liverpool City Council's planning department and Red Ninja, an application development company. The project objective was to look at the feasibility of developing new systems using narrative processes and digital technologies such as visualisation to better articulate and

understand design proposals. The aim was to improve transparency, public engagement, impact and communication.

Physical Playlist

PI: Paul Coulton, Lancaster University.

Partners: BBC R&D Salford

Research PhD: Dan Burnett, Adrian Gradinar, Joel Porter

Physical Playlist aimed to investigate the relationship between physical objects and digital content using the concept of the 'mix tape' as the basis for exploring the subject of sharing, trust, and value by embedding digital content into physical objects. Mix tapes were a thing of love, a physical object which people would share with significant others and friends around them that became popular between the 1980s and 1990s. They were naturally a social object and highly representative of a person's identity. The knowledge of effort involved by the giver in selecting the songs and having to sit through each one was also part of the symbolism for the receiver. Thus, the modern mix tape could become a linked series of small objects like lucky charms that are physically shareable in a form representing the tracks they contain. This is based on the idea that physical items often have great meaning to us as physical beings and add a level of exclusivity and personalisation to the sharing process. Physical Playlist worked with BBC Research and Development (Salford) in the development of the project.

TILO

PI: Gareth Harvey, Glyndwr University North Wales / Andrew Quick, Lancaster University

Partners: Amaze; FACT Liverpool; MeYouAndUs

Research PhD: Naomi Jacobs, Joel Porter, Lara Salinas, Hannah Stewart

TILO was an interactive screen based technology designed to research visitors' willingness to exchange personal data as part of the interactive experience. TILO aimed to create a dialogue between the arts organisation, the building and its visitors, and allowed artists to carry out their own interventions. The system was piloted at FACT in Liverpool, one of the UK's leading media arts centre's.

4.1 Chattr

4.1.1 Introduction

Chattr was a provocative and confrontational arts and research project that investigated the ethical and privacy issues surrounding social media. The aim of Chattr was to examine the attitudes to privacy between digital and physical spaces. Chattr existed within a physical space and offered the user the exclusivity and comfort of a first class departure lounge with the aim of emulating an online virtual social space. Using similar terms and conditions as Web 2.0 services, Chattr invited users to interact within the social space in return for the right to record, transcribe and make public all conversations online that have taken place within the Chattr lounge. The lounge environment was designed to create a division between Chattr users who have luxury seating and non-users who have a more municipal experience. By signing up to Chattr, the users are offered additional bespoke seating and exclusive views of the city. The service was designed to replicate the additional benefits of an online social communication tool, such as Facebook, and to record the user reaction in the physical space.

This study examined the reluctance of some individuals to enter the Chattr space whilst comparing responses with those that agreed to participate in the project. Observational studies, photography, and interviews were implemented to note user behaviour within the space (See figures 6, 7, 8 and 9). The project was intended to challenge the notions of privacy in the physical space and to raise important questions that affect ethical decisions in the digital space.

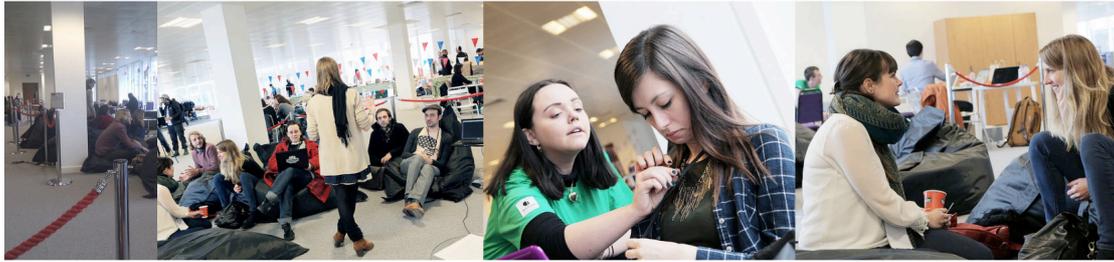


Figure 6. Chattr at FutureEverything, Manchester



Figure 7. Chattr at TodaysArt, The Hague

Chattr was a collaborative project involving Lancaster University and Royal College of Art as well as staff from Future Everything in Manchester, artist Kyle McDonald and academic staff at Dundee University. The initial project was funded by the Creative Exchange within LICA at Lancaster University and piloted at the FutureEverything conference in Manchester in March 2013 and at TodaysArt in The Hague, the Netherlands, in September 2013.

4.1.2 Background

The original focus of the Chattr project was linguistic style matching proposing the following question: 'How may linguistic style matching (LSM) be used to visualise in real-time the degree to which participants in a networked conversation are 'in sync' with one another and thereby generate novel interaction' (Creative Exchange Chattr proposal, Lancaster University: 2013). As the project progressed, however, it became apparent that LSM was not going to be realistically achievable in this setting because of technical limitations and the suitability of the type of conversations

possible in a public context. The project went through a series of iterative changes before the shift from LSM to its final form which concentrated on the issues of privacy of networked conversations and the consent around sharing personal data.

Kyle McDonald, who was originally the artistic lead on the project, withdrew after it was stated that ethical approval would have to be obtained through the university's ethics committee. McDonald disagreed with the process, suggesting 'safeguarding took all the impact out of the experiment, I think you have to make things provocative or even dangerous if you want people to pay attention,' (WIRED Magazine 23.04.14). However, McDonald continued to develop the idea and later created a similar project entitled Conversnitch with artist Brian House in 2014. The Conversnitch project was designed as a provocation that raises questions of privacy in which the artist designed and built an object, which substituted a standard light bulb with an audio recording device. Once installed in the place of the light bulb, the device recorded audio and broadcast from its location, sending the audio conversation via Wi-Fi to a service where it was transcribed and posted online via the twitter #conversnitch account. A film depicting the installation of the device in spaces such as public libraries, offices and fast food restaurants demonstrated the ubiquity of how prevalent devices are already surreptitiously logging our presence in the physical world and publishing them to the online world.

A subsequent interview with Kyle McDonald demonstrated that outside of an academic institution, McDonald and House could work without the constraints of an academic ethics committee. However, the conversation with Kyle McDonald

revealed that, despite the controversy of the Conversnitch project in the popular press, the work was not installed without the knowledge of the owners at the specific private locations:

Brian also was really keen on showing Conversnitch in a private space for the video we made, but I'm happy to say privately (i.e., in a more academic and less pop/news-oriented context) that we never actually installed Conversnitch in a private location unbeknownst to the people there. The risk of publishing something dangerous would be too high in that situation. The video was more about suggestion than documenting our actual performance.

(Email conversation between Kyle McDonald and Joel Porter 06.06.14)

In the case of the Conversnitch project, Kyle McDonald defined his own ethical and moral stance and the boundaries within which he was willing to work, in direct opposition to the ethical and moral stance of the universities that were involved in the Chattr project. In conversation with McDonald, he identified the boundaries of Conversnitch in which the line he was not going to cross was one that might put someone in danger:

Brian and I were aware of the fact that we might accidentally publish something that could severely infringe on an individual's privacy or put someone in danger. Every artist has a different understanding of where they need to put their boundaries when interacting with others, but for me, that's my boundary: I'm not going to put someone in danger for the sake of

sparking a discussion about privacy and surveillance. We knew this was a possibility, but within the constraints of the project (140 characters, 10 second intervals, a few thousand followers) we felt that it was such a limited possibility that we would be able to respond quickly in a way that would protect anyone that might accidentally be put in a compromised position.

(Email conversation between Kyle McDonald and Joel Porter 06.06.14)

4.1.3 Chattr redesigned

Chattr was subsequently redesigned on the recommendation of the ethics committee that requested that participants should be informed all conversations would be recorded.

As a researcher within the design team, I was involved during the original design process and as the project progressed I contributed to the redesign of the final project. I put forward a proposal to investigate visitors' reluctance to enter Chattr while also designing a questionnaire (see figure 38 Chattr decliners survey and 4.1.5 research methods) to investigate visitors' averseness. My research was informed by my previous work whilst exhibiting at the Cornerhouse in Manchester as described within chapter 1. I had previously explored personal reactions to sharing information through everyday technologies, such as Radio Frequency Identification (RFID) commonly found in contactless credit cards and identity cards often used in workplaces to access rooms and offices. I was curious to explore personal fears of sharing personal data through technologies that many people take for granted. My motivation during Chattr was to investigate whether visitors would decline to enter a

physical space that mimicked the digital environment of a social network, and whether this would prove to be contradictory, as many visitors would also be engaged in conversation online.

I initially designed the workflow diagram (see Figure 39. Chattr flow diagram designed for FutureEverything) to highlight the route visitors would follow within the space. This had two objectives, the first to satisfy the ethical requirements for participants to be able to withdraw from the research and secondly to identify the path of individuals that declined to enter the space. The design accommodated the ethical conditions to record visitors conversations in a private space (see Figure 39. Chattr flow diagram designed for FutureEverything) as the rights of the individual were required to fulfil the conditions of the project. The design allowed individuals the ability to opt out despite originally opting in to the recording process, as the project considered the ethical stance of vulnerability during participation. Paradoxically, while the design of the Chattr project adapted to accommodate the university ethics committee's 'informed consent', the ambition of the project was to mimic the environment of the social network and to have researchers remain anonymous. However, researchers remained visible during the process of obtaining consent while recording participants engaged in Chattr, despite the risk of undermining the credibility of the environment that was designed to simulate the online environment.

During FutureEverything in Manchester, participants were given a microphone and allowed access to a separate area with comfortable seating (See Figure 6. Chattr at

FutureEverything, Manchester). Later at TodaysArt in The Hague, microphones were integrated into terracotta guinea pigs, which reduced the visibility of the recording device (See Figure 9 User engagement with the recording device (Guinea Pig)). This change was based upon the feedback during FutureEverything in which participants were required to wear a microphone attached to their lapel applied by a member of the Chattr research team. This process was considered to make the process more visible and therefore had an impact on visitors' participation, whereas the guinea pig was considered to be less threatening and was embraced by visitors at TodaysArt.



Figure 8. Visitors embrace the guinea pig recording device at TodaysArt, The Hague.



Figure 9 User engagement with the recording device (Guinea Pig)

In both environments, the outcome was a series of anonymised, transcribed conversations obtained from participants who signed up to the terms and conditions of the Chattr agreement. All audio files containing conversations were destroyed as part of the ethical requirements of the project but the transcripts remain a testament to the work of the transcribing and were later coded and analysed to obtain further research findings. In addition, extracts of the conversations were displayed on public screens (See Figure 7. Chattr at TodaysArt, The Hague) and tweeted during the project to gauge reaction to the project in real time and to maintain the same environment as the Social Network Sites (SNS) while recording the process of engagement and behavioural change.

4.1.4 Research design

The research during Chattr was developed within a physical space during the investigation, this was important within the context of researching individual behaviour within digital public space. I was curious to investigate whether visitors perceived the physical space to differ from the online environment and I was also interested to identifying potential conflicts in visitor behaviour based on the premise

that many visitors would be communicating online through social media sites during the festival but may feel uncomfortable in entering the Chattr space.

This resulted in identifying visitors outside of the Chattr environment and inviting those that did not wish to engage to be interviewed for research purposes. This included questioning non-participants about their online habits as well as their reasons for not wishing to engage. The research also considered how the accumulation of collective and connective memory in social networks affects the ability to control personal information. Collective memory is the social aggregations of memories typically passed on through generations and often surrounds a specific event that has national or international significance where 'collective remembering is understood as a serial formation defined only by each member's relation to a definite event but not to each other' (Simon 2001, p.1). Connective memory is the aggregation of data built by emergent social media networks where the dissemination of knowledge of world events is built by the connection of tags, images and text in order to reflect a world-view designed by the user within the network: 'contemporary memory is not principally constituted through retrieval nor representation of some content of the past in the present, but, rather, it is distributed through our sociotechnical practices, including our everyday usage of the internet. This kind of memory operates in "run-time"' (Hoskins 2009, p.3) in which the references to the past alters every time it is accessed. This emergent view of connectivity conflicts with the concept of data as a fixed object as 'memory as documents, maps, literary text, letters, archaeological remains, bones, videos, films, CDs, all those items are supposedly resistant to change' (Taylor 2003, p.19).

The aim within the Chattr project was to query the perceived concerns that are present in social media networks where data mining, aggregation and secondary use of personal data is known to undermine privacy in the digital space. The process of data mining is defined by the process of storing data and extracting information from large data sets for further use. Aggregation of data in this context allows for many systems to converse and to bring multiple sources together to build further analytical perspectives on users' habits and behaviours: 'by combining pieces of information we might not care to conceal, the government can glean information about us that we might really want to conceal' (Solove 2007, p.18). The combination of the methods of data gathering often are used for secondary use where patterns emerge to identify and build a user profile that can be commoditised and an individual directly targeted. Aggregation raises concerns regarding capture of individuals' data where the user has no knowledge that data is being stored or reused, known as 'exclusion'. It is this form of data storage that is often cited as the main concern for users of social media tools. Chattr's terms and conditions (See appendix 8.1.3) were deliberately designed to highlight and mirror the use of the terms offered when accepting a social media tool's legal framework. Creating an environment for the conditions to be questioned in the physical space allowed exposure to various arguments that affect users' interaction in the online environment.

4.1.5 Research methods

The following methods were used during Chattr:

- Questionnaire
- Structured and semi-structured interviews
- Observation
- Photography

I designed a questionnaire consisting of a series of structured and semi-structured interview questions (see Figure 38 Chattr Decliners Survey). The questions were designed to be quantified and were followed by an open-ended question based upon the initial reaction. The aim of this was to investigate the contradictions in the responses. For example, if someone is already sharing personal information online through social media sites, what is the cause for not wishing to engage in the physical environment of Chattr?

I conducted a series of interviews to investigate visitors' reluctance to enter and participate in the Chattr space. The focus of the project was a study of visitors' perceptions and concerns in having their personal conversation broadcast online, including their reluctance to enter and participate in the recording process. I also recorded the visitors' experiences outside of the Chattr space. It is the visitors who declined the invitation to enter the Chattr space and who resided outside of the space who are the focus of this case study.

I devised a mixed methods approach that was designed to contrast the users' online data sharing habits through a series of qualitative and quantitative questionnaires while 'embedding one dataset within the other so that one type of data provides a

supporting role for the other dataset' (Creswell 2007, p.7). The first set of questions generated a subset of binary responses that were used to inform the final question that would create a quantitative response. I felt the original quantitative responses alone would not allow a deep enough understanding as to why visitors declined to enter the Chattr space. The combination and inclusion of further questioning would offer an additional set of responses that could be used during the interview. The qualitative format identified specific categories that would define visitors' online social habits, how they conversed online and the types of content they shared, and with whom they were willing to share content.

The initial question, 'Do you have an online account with any of the following online services?' identified the users' level of participation with social media tools. This was supported by a list of online sites that required the user to identify which accounts they used from a list of Facebook, Twitter, Flickr, Amazon and YouTube or none of the above.

The secondary question, 'Have you ever shared content or had a conversation online with someone that you do not know personally?' determined visitors' content-sharing habits, whether they shared personal conversations and content with friends and family online, or whether they would be willing to share personal content with someone that they did not know personally. I then asked what types of content were shared, whether photography, video, or text conversations.

Further questions asked whether the user shopped online and whether they owned a supermarket loyalty card. These questions were designed to highlight the connection between user data and the digital and public space before asking the final question 'why do you not wish to participate in Chattr?'. By embedding and

highlighting the initial set of quantitative answers given by visitors' online habits, I could query why they did not wish to participate in the physical space if the responses proved contradictory to visitors' existing participatory online behaviour. Photography and observation was also used as a method within the study and I documented the behaviour of visitors within the space that revealed a playful engagement with the guinea pigs that contained the recording device (See Figure 9 User engagement with the recording device (Guinea Pig)).

4.1.6 Key findings

A series of twenty-nine interviews were conducted that investigated visitors' reluctance to enter and participate in the Chattr space. Each visitor was interviewed to examine how social media, email, online and offline shopping experiences collectively contributed to personal data sharing. Each visitor was interviewed within sight of the Chattr space, allowing visitors either to participate or refrain at the point of contact with the interviewee. All twenty-nine people interviewed suggested that they were more relaxed online than in the physical environment of Chattr.

What the findings have identified is:

- Visitors felt safer online as they trusted and perceived to have control of their online space.
- The asynchronous communication offered within online Social Network Sites was considered trustworthy and more convenient.
- Visitors that declined to enter Chattr did not consider the trade in personal information to be reciprocally beneficial.

- Visitors that entered Chattr reinforced the existing online behavioural model of perceiving the space to be a risk free environment.

The findings during the interviews revealed that while visitors are reluctant to enter into a physical place, they already shared and distributed information and content about themselves in multiple virtual places, through online purchases and sharing lifestyle information via social media sites. Figure 10 below represent the social media usage from the interview data.

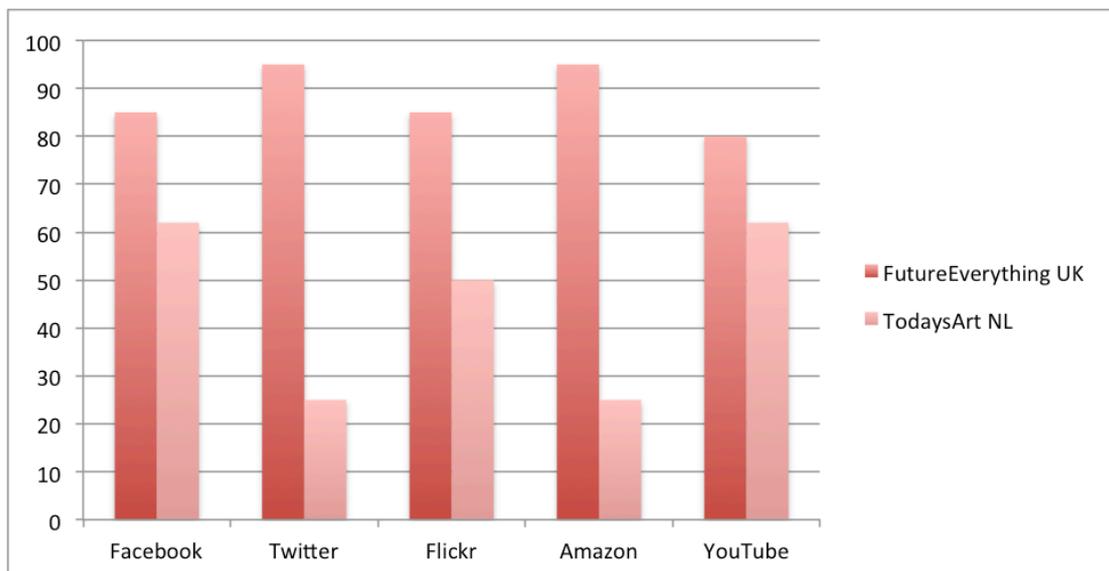


Figure 10. Percentage of Social Network usage between FutureEverything & TodaysArt

Overall, 79% of people interviewed had Facebook accounts, 75% had Twitter, Flickr, Amazon, and YouTube accounts respectively. 96% shopped online and 47% owned a supermarket loyalty card. Only 17% of those interviewed stated that they would not share online conversations with someone whom they did not know personally. Eighty percent of people interviewed stated that they used their personal account to converse with someone that they had never physically met and 61% said they use a separate work account to do so.

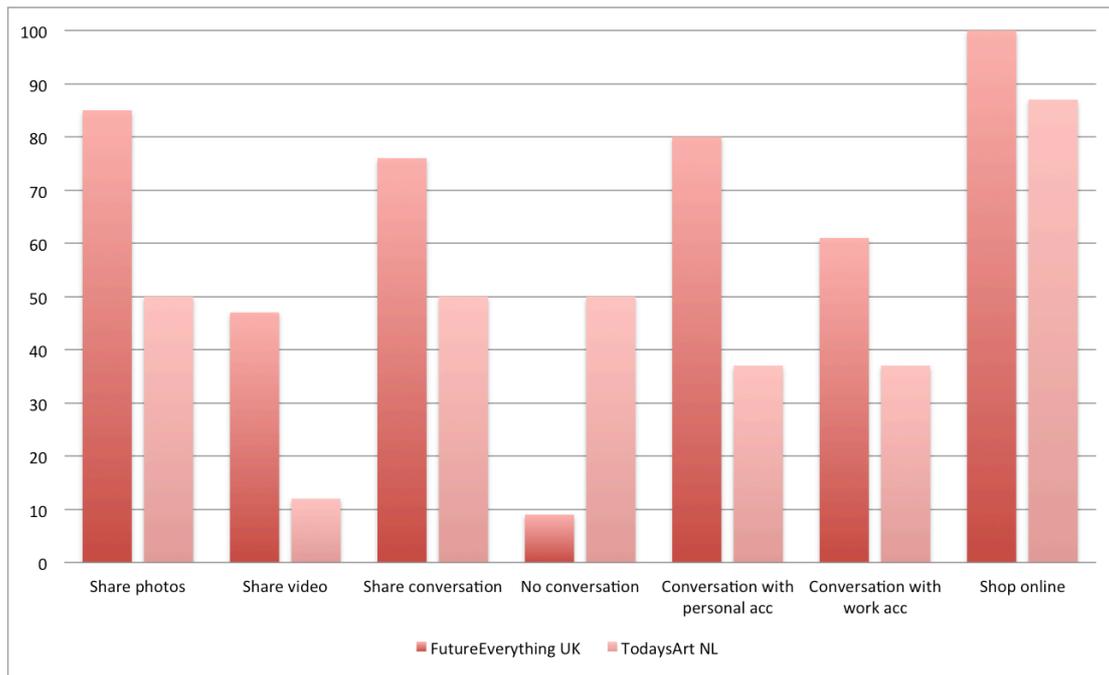


Figure 11. Sharing habits, FutureEverything and TodaysArt

At FutureEverything in Manchester, I interviewed 21 visitors during the 2-day conference within the conferences café environment, which was located alongside the Chattr space (See Figure 6 and Figure 7). While all users interviewed had at least one social media account with Facebook, Twitter, Flickr, Amazon, and YouTube, the main reasons for not wishing to participate with Chattr was that the visitor did not want to share conversations in the physical space. Other visitors that had arrived alone highlighted that they did not know what to say or had nothing to say; moreover, one visitor stated that there was no visible value exchange in the use of the space in the same way that Google offers value in its services such as search returns and GPS mapping. Eighteen people interviewed had Facebook accounts, 20 had Twitter, 18 had Flickr, 20 had Amazon, and 17 had YouTube. All 21 shopped online and 50% owned a supermarket loyalty card (see Table 13 FutureEverything survey results). Only 9% of those interviewed stated that they would not share

online conversations with someone that they did not know personally. Furthermore, 80% of people interviewed stated that they used their personal account to converse with someone they had never physically met, and 61% said they had used a separate work account to do so.

4.1.7 Analysis

The analysis of the Chattr project identified a level of mistrust from those that did not wish to enter the Chattr space. For these people, fear existed over a lack of control that related to a loss of ownership of personal data. Using Lyon's (1994) terminology, they might be described as the greatly concerned, while those who did enter the Chattr space could be described as unconcerned and carefree (Lyon 1994).

4.1.8 Safer online

The privacy terms of Chattr clearly stated that all conversations would be transcribed and broadcast online, and those visitors who did not wish to engage stated that they felt safer within their own online environment. One visitor who did not wish to participate stated that the reason for feeling safer online was that the 'aesthetic frame defines (the) place' (Chattr visitor #8). That is, the trust is embedded within the aesthetic of the virtual framework of the online space through the user's personal homepage within social network sites such as Facebook or Twitter. Just as 'Facebook's colour coding is so homogenised (dark and light blue and dark and light grey on a white background) is meant to convey very specific meanings about how this interface should be interpreted' (Garde-Hansen 2009, p. 140), the boundaries of the online space create their own formal branding. While the formality of the online

product has matured over time, so too the familiarity of the product has created levels of ownership and trust. The branding of the product and the screen's frame becomes a place where it is safe to talk, and that is where the perceived boundaries of the Chattr space were blurred.

4.1.9 Ownership

The framework that surrounds the online environment appears to offer an illusion of ownership, the advantage of which is the aggregation and use of personal and collective data that creates a form of a shared experience. It is this immersion where a 'space becomes place when it acquires symbolic meaning and a concrete definition, marking the whole spectrum of identity and sense of belonging' (Tsatusou, 2009, 12). It is the aesthetics and new meaning of the sense of place that has become a safe space for many who inhabit the online environment. The 'aesthetic frame' of the screen combined with the perception of ownership, reinforced by the frequenting of family and friends, led to a level of perceived trust.

Chattr was integrated in the real-time of a real world environment, in a space that had no boundaries that can be defined or trusted. For non-participants, the physical space of Chattr was treated with fear and suspicion. The findings from Chattr suggest that both venues, FutureEveryting in the UK and TodaysArt in The Netherlands, amplified personal fears of data use, re-use, and data sharing by making what is considered a digital space *physical*.

4.1.10 Asynchronous communication

In addition to feeling safer online, the ability to control the mode of communication was perceived as an advantage for those that used social networks. As one visitor commented, 'online is more fluid' (Chattr visitor #16) while another suggested, 'online is planned. Chattr is overheard and spontaneous which I wouldn't do online' (Chattr visitor #19). While visitors recognised that they had signed, but not read, similar consent forms for online services, most felt more in control online as they could navigate and converse in their own time, asynchronously. The asynchronous communication or 'disruptive spatiality' (Harvey, 1993) relates to the time and space between two people whose commitments are not always in sync, often due to their geographic location but also due to the rise of multiple, simultaneous conversations. The online space offered the possibility to continue to relate without the need to have a physical conversation in real time while being able to continue to manage multiple conversations over a distributed time frame that is only possible outside the linear realms of the physical space.

In addition to wanting to be in control of the interaction, personal privacy was also a concern for individuals. This was reinforced by the statement, 'online is planned, Chattr is overheard and spontaneous which I wouldn't do online' (Chattr visitor #19). This suggests that, like the perceptions of CCTV in public places, the presence of audio recording devices during Chattr implied that being overheard could not be controlled. This was repeated in another response 'I don't want to share conversation, online is private. I set my settings to private, only personal friends can access' (Chattr visitor #18). This quote suggests that the individual had control over the digital space but did not consider that control could be enacted in the physical

environment. As one visitor suggested, 'It would be impolite to have a conversation with someone you don't know if you know it is being recorded' (Chattr visitor #15). The implication from this statement is that the physical space of the Chattr lounge differs from an online space despite the fact that what Chattr was offering was contractually comparable to similar SNS. What was being exploited in the physical space co-existed in the digital space, while at the same time, it was not recognised by visitors.

4.1.11 Reciprocal trade

The acceptance of privacy notices within social networks lead to an engagement online based on a level of trust that is dependent on a perception of risk (Milne & Boza 1999; Milne & Culnan 2004). The opposite of this was evident in Chattr, when visitors indicated the perceived risk to be too great and not reciprocal enough to engage.

While information is required in the process of making an online transaction, the amount of information requested often exceeds that which is required for the original purchase. Protecting information during online transactions can be identified in the way individuals relate to the trust of the companies responsible for handling personal data, alternatively known as Information Privacy Protection Responses (IPPR) (Son & Kim 2008). The study attempts to clarify information privacy threats and suggests that users withdraw or complain through third parties rather than confronting the company directly (Son and Kim 2008).

Some Chattr participants saw personal content within social media as a commodity: that is, user-based social media content is traded for tangible tools for everyday use, like calendar access, online meeting polls, and photo sharing. However, visitors felt that Chattr did not offer any additional opportunity or benefit over the equivalent services that could be delivered online. The lure of free coffee and a comfortable sofa was not enough to entice the public to share conversations in the communal environment of Chattr. In the context of the Chattr physical space, it seemed as though most visitors did not see the value of it, particularly in terms of sharing conversations in the physical space, not knowing what to say or having nothing to say if alone, or getting something back for using the space as you might with an online service:

‘I don’t know what the value exchange was. With Google Streetview, you do. It’s not just about the physical vs. online, it’s about value.’ (Chattr visitor #11)

Conversely, visitors that agreed to enter the physical space were unaware of the implication of their actions in the digital space. Conversations became playful, with a disregard for the consequences of what was said and published. Chattr participants demonstrated that the Chattr space created an environment that allowed participants access to play and to manipulate the physical space in the same way as they do in the online space.

4.1.12 Risk free environment

The Chattr results corroborate the behavioural model described in the study by Stern (2008) and Lampinen (2011), which investigated the online behaviour of teenagers and demonstrated that 'Performing and playing with their identities in online public spaces is especially gratifying, because it is viewed as less risky but potentially more validating than experimentation in other arenas' (Stern 2008, p.113). Lampinen (2011) reinforces this by suggesting that people have more control over their online persona than they do in the physical environment (Lampinen et al. 2011).

The hypothesis by Stern (2008) that the online space was perceived to be a less risky space was tested during an encounter between two individuals engaged in Chattr at the TodaysArt Festival as the following example demonstrates.

As two customers enter the Chattr coffee shop, they are offered free refreshments, comfortable sofas, and Wi-Fi. All that is asked is that for the exclusivity of entering the café space they agree to Chattr's terms and conditions before helping themselves to free beverages. The customers agree and enter the café, and as a conversation unfolds, the discussion reveals both recipients in conversation with a third party, named 'Skippy'; the rationale for the name can be explained in the knowledge that each visitor upon admission was given a life-like terracotta guinea pig, which concealed an audio recording device. Within the terms and conditions it clearly stated that, in return for free refreshments, all conversations will be recorded, transcribed and placed online.

The conversation begins:

Don't lie to the pig, it knows perfectly well we just put a bomb in the Tube, in London.

Skippy don't listen to him.

Listen to me Skippy.

SKIPPY DON'T LISTEN! (transcriber's emphasis)

How are they transcribing all of this?

Yeah so, what about this? I'm not sure this is interesting to the public.

I'm pretty sure this is an experiment to bore the public to death.

This is the only hope your private information doesn't get out because there is so much of it.

They just filter it.

I filter it everyday.

...

Whilst this narrative portrays a conflict within the fictitious environment of Chattr, the event and conversation was recorded and broadcast in line with the terms of use. While Chattr has demonstrated, in principle, that it reflects the same conditions of the social networks it was designed to mimic. It is evident from the transcript there was a struggle between two participants in conversation. The comment that there is a bomb in the Tube, suggests the protagonist is amused by the environment and cannot take the situation seriously, during which the antagonist is clearly not amused by the comment and attempts to divert the conversation. There is a

perceived fear from the participant that what is considered a private conversation will become public as they attempt to stifle the conversation. The reference to 'your private information' reflects an understanding, suggesting the participant recognises that conversations online are, by their nature, never private. However, this encounter, as the terms and conditions described, allow all conversations to be made public and this particular comment was subsequently tweeted, and re-tweeted with the title 'We put a bomb in the London Tube', while this is perceived to occur within a risk free environment, it has potential to lead to further complications in the real world.

4.1.13 A lack of awareness

This lack of awareness continues to manifest in a number of reported cases in the media in which individuals have been reprimanded, or held by government authorities based upon their online actions.

As Chattr participants demonstrated, for some the safety of Chattr created an environment that allowed participants access to play in the physical space in the same way as they do in the online space; as participants of Chattr in The Hague relaxed in the physical space, they lost their inhibitions while they were recorded, transcribed, and tweeted. Although participants are comfortable enough to speak candidly within the confines of a one-to one conversation the consequences of posting in a online space has repercussions in the real world. A small proportion of participants used misinformation such as false names, injected offensive language into conversation, as well as introducing alternative languages to evade

conversations being translated before broadcast. However, all conversations were transmitted irrespective of what was said.

What Chattr has highlighted is how easily the physical and digital environment can become blurred, to the point that the boundary between what is considered public and private is no longer identifiable. One example in the media was the story of the UK resident, Paul Chambers, who was frustrated over the cancellation to his flight in 2012 and tweeted about the airport, 'You've got a week and a bit to get your shit together, otherwise I'm blowing the airport sky high!!' (Paul Chambers via Twitter, 2012) and was subsequently arrested under the UK Terrorism Act and questioned for 7 hours. Further examples of how comments posted online can lead to widespread panic was witnessed during the posting of a single tweet in August 2014 that suggested a terrorist attack on the London Underground was imminent. It took two prominent Metropolitan Police officers to dispel the rumours and alleviate fears circulating on social media. The Metropolitan Police later put out a statement to suggest, 'these rumours are not uncommon. The only thing that gives them any credence is people re-tweeting them and circulating them' (Metropolitan Police spokesperson, 2014). It is, however, potentially more troubling that Twitter is attempting to become the go-to online provider for global news (Express Newspaper online 2015) while it is an open platform with little regulation. As online social networks aggregate information and indiscriminately attribute content based on its content, the recipient of information online has no way of interpreting the motive of the original content which can lead to fear spreading through the networks. One solution put forward by the World Economic Forum (WEF) in tackling the spread of false information was to rate online profiles in the way Ebay does: 'Feedback ratings

on eBay, which enable users to assess the reliability of vendors, [and] offer a potential template for the development of such a service' (WEF, 2013).

4.1.14 Conclusion

Overall, Chattr was successful in emulating the environment it was set up to research. By mimicking the conditions of the social networks of Facebook and Twitter it was effective in raising questions about personal privacy, trust, and the trade in personal information in return for goods and services. The responses to the questions raised during Chattr progressed the research in identifying behavioural patterns that both support and contradict earlier research. Chattr was designed to mirror the functionality of SNS by recording everything said within the space. The study highlighted that visitors understood the physical space to function in a different way from the digital space, a space they also inhabited, despite the two environments performing similar functions. The physicality of the space and the trust engendered within it, in which digital interactions also occur, demonstrate a complex relationship between the digital and physical environment and data shared within it.

The analysis of Chattr revealed that:

- Participants felt safer online than in the physical space of Chattr.
- Reciprocal trade was important in establishing levels of participation, however, the exchange of personal data relied upon a more nuanced relationship that required levels of trust.
- The use of recording methods during Chattr raised debates around the ethical use of personal data as a research method.

4.1.15 Safer online

The analysis of Chattr reveal that participants felt safer to converse online because they perceived to be in control, away from the physical environment of the café where everything they said was being recorded. This finding suggests a revision to what many scholars (Smith et al. 1996; Taddicken 2014; Milne & Boza 1999) say about concerns of control of personal data. While Smith et al. (1996) suggest that individuals with a high level of concern may refuse to participate in activities that require sharing personal information, Chattr demonstrated that individuals strongly declined to participate in the physical environment due to the fear of the unknown, preferring to converse in established, online services that offered the illusion of personal ownership.

4.1.16 Reciprocal trade

Reciprocal trade was one of the critical factors in determining why individuals participate in sharing personal information online, with individuals acknowledging they understand the trade in personal information in return for free goods and services online. Personal content within the context of the social network was seen as a tradable commodity where distribution of user-based content is traded for tangible tools for everyday use, calendar access, online meeting polls and navigation aids. Chattr did not offer a good enough trade, resulting in the reluctance to enter the Chattr environment. The free coffee and sofa access did not constitute a fair reciprocal trade to justify the recording and broadcasting of personal conversations.

4.1.17 Lack of awareness

For the individuals that participated in the Chattr there was a lack of awareness brought about by a level of technological blindness combined with a carefree attitude. This is represented through a lack of knowledge of what is technologically possible, which has the potential to lead to extreme consequences brought on by individual actions. The conversation that highlights this argument, which was broadcast with the term 'we just put a bomb in the Tube', mirrors the same lack of awareness that resulted in Paul Chamber arrest in 2012 after the tweet 'I'm blowing the airport sky high!!' (Paul Chambers via Twitter, 2012).

4.1.18 Ethical considerations

Chattr was developed as a collaborative arts research project after Kyle McDonald (the original project lead) left to follow an independent path to that of the original research route. The design of Chattr raised further questions about the suitability of practice-based research as a suitable method of investigation. Chattr and Conversnitch revealed, they both offer insights in to the impact of emergent technologies upon personal behaviour and how personal data sharing will continue to challenge the way individuals make choices in both physical and online spaces. Chattr emerged from an institution where ethical responsibility challenged the design of the project whereas Kyle McDonald introduced Conversnitch as an arts-led project that did not have to conform to the same ethical constraints. Furthermore, Conversnitch was devised and performed by an artist who created and took ownership of a personal moral stance regarding what he considered personal and private. As a result, there is still an ambiguity of what constitutes a breach of privacy

in the Conversnitch project (e.g. with Chattr, participants knew they were being recorded). Where both projects overlap in scope, the differences are within the ethical considerations and transparency of sharing data in a public space.

Despite the successful marketing and publicity of Conversnitch, the project could be considered a project of unknown outcomes. As a performance, the project provoked a global reaction, with news of the invention featuring in *Wired Magazine*, *The Daily Mail*, *The Guardian* and *The Independent*; however, the lack of an audit trail from the project has the potential to lead to mistrust, as participants did not know they were a part of a project in which data was being collected from them. The output of the project, a series of tweets that suggest a recording of surreptitious conversations, lacks robustness. This is something identified by McDonald, who highlighted that a series of tweets were removed from the project as the origin of them was not acknowledged. In a later interview with *Wired Magazine*, the artists admitted that while the audio was transcribed using Google's Mechanical Turk, the transcriptions might not have been trustworthy (Greenberg 2014).

I think the biggest difference for me in working on Conversnitch compared to Chattr was the feeling of knowing all avenues were open once I was working outside of an academic context. That said, I was really surprised at how close to the original concept Chattr was even in spite of the limitations. There's something to be said both for working within only your own ethical constraints, and working within the constraints of an institution. They produce different but complementary kinds of innovation. I think generally the public responds well to academic innovation when it includes technical

accomplishments, and artistic innovation when it is transgressively performative or aesthetically affective.

(email conversation with Kyle McDonald and Joel Porter 2014)

While Conversnitch sits outside of the confines of the academic institution, the project did address the concerns of what is considered private within the digital public space. As Chattr adhered to the ethical guidelines for research in an academic institution, it also raised an awareness of sharing personal data in online social networks. The perceived view was that concerns over privacy in the physical space of Chattr would reinforce the fears of aggregated personal data in online spaces. However, Chattr contradicted the existing claims of Solove (2001) and Roosendaal (2011) who have identified concerns over personal data sharing. Responses to Chattr reverse the trend where personal fears of data sharing are confined to the physical space and the safe space becomes the managed online environment of social media.

4.1.19 Further questions

Chattr raised further questions during the study that identified a nuanced relationship between individuals and the reciprocal trade in personal information. The reciprocal trade that was evident in existing online interactions between individuals was clearly lacking during Chattr. When questioned visitors demonstrated that there was a lack of trust in Chattr and how personal data would be re-used, as well as what was reciprocated. This raised questions about the environment in which data exchanges occur and to what extent personal trust is perceived to be equitable. Issues raised from the findings during Chattr progressed through projects such as

TILO, and Physical Playlist that continued to question how personal data exchanges within public spaces affected personal behaviour and, to what extent the reciprocal trade in personal information was an acceptable form of data exchange.

4.1.20 Summary

Chattr progressed the research by highlighting discrepancies between physical and digital environments. The research acknowledged those that declined to enter Chattr considered online spaces to be safer environments to converse. For visitors who preferred to communicate online the research identified the reciprocal trade in personal information through SNS was an important element in user engagement.

4.2 Open Planning

4.2.1 Introduction

Open Planning was an investigation of current limitations when engaging the public in the urban planning process. The project objective was to look at the feasibility of developing new systems using narrative processes and digital technologies such as visualisation to better articulate and understand design proposals. The purpose of the Open Planning project was to make the planning application process in Liverpool more transparent, and to improve public engagement and communication. Open Planning was a collaborative project involving the Creative Exchange (Lancaster University), Liverpool City Council's Planning Department, the Department of Architecture at Liverpool University, the community groups Engage Liverpool and Liverpool Vision, as well as Red Ninja Studios who supported the consultation, design and development of the open data mobile application.

All local planning authorities are required by law to publicise all planning applications. This can include advertising via a local newspaper, on-site notice and through local authority websites. The current model relies on a 21-day consultation process in which the local authority is legally bound to advertise local planning applications. Planning applications are advertised *in-situ* within sight of the location for development and also online within the local authority website during the consultation period. Public access relies on awareness and engagement through these methods, whereas the discovery of a live application often occurs through happenstance, as it is the physical sight of a lamp post sign that prompts enquiry, rather than planned engagement from the local community. Engagement in the

consultation process often relies on a follow through procedure from the street signage to the website, both of which are not clear or easily accessible.

In order to understand the relationship between open data and the planning process, the following describes both the legal framework of the planning notice and the UK Governments proposal for planning information to be made public.

4.2.2 Defining the planning notice

The current planning application notice relies on public access to the planning application; through the national online planning portal connected via the local authority planning office websites, or through the physical site notice that is legally required for all planning applications. The application notice in the physical space is synonymous with the image of an A4 sheet of paper, photocopied, hand-dated, laminated and zip tied to a lamp post. By law, a series of copies are required to be sited within range of the proposed development site to allow passers-by to be informed of the proposal. The signage is a fixed format, whether the planning application is a small amendment to a domestic building or a large corporate development. It was this intransigence of scale that Open Planning intended to address. The lamp post signage connects, but not exclusively, the physical application notice to a digital application within the local planning office. If a participant intended to see the full planning data, the paper notice holds the reference number, a unique identifier that links the site notice to the digital plans. The identifier is a combination of numeric and letter characters that forms a unique string (i.e. reference number) that associates the planning notice with the planning application. While the planning notice gives passers by a basic outline of the

development plans, the full application has to be accessed using the reference number via the planning authority website. The translation of the site notice is compounded by the level of legal terms that are designed to comply with the remit of the planning department but is not easily accessible outside of the planning environment. An example of this is a site notice with a proposal that states, 'variation of condition 11 attached to planning application SL/2012/0806' by South Lakeland District Council in 2013. With no other detail other than how to contact the council and the legal framework for the site notice, engagement relies on the passerby to follow up using the application reference number for further information.

Through the process of improving engagement with both the physical and digital application, the intention of Open Planning was to research how planning data would inform local communities, developers and planning agencies by creating a hybrid model that would integrate services between the digital and physical space. By redesigning both physical as well as the digital platforms through the Open Planning Project, the aim was to create greater awareness via the repurposing of existing open mapping data with existing planning data.

4.2.3 Planning legislation and initiatives

Consideration of UK Government initiatives were reviewed during the initial public consultation stage, including the UK government Planning and Empowerment White Paper (UK Home Office 2007; UK Home Office 2008), the National Planning Policy Framework (UK Home Office 2012) as well as the Clarke report to the National Planning Policy Framework (2012) recommendations.

In 2007, the UK government planning white paper (UK Home Office 2007) introduced a proposal to simplify the planning system, as changes had not been amended since 1995. The aim of the changes to the current planning system was not only to simplify the application process, but in doing so, ensure that the planning system 'supports vibrant, healthy sustainable communities, [and] promotes the UK's international competitiveness' (UK Home Office 2007, p.5). Simplification of the planning system was also designed to ensure that local communities were included within local government decision-making processes. The white paper highlighted the current condition across the UK, that the 'concerns about the complexity and inaccessibility of the process of applying for planning permission continue to be expressed by businesses and the wider public.' (UK Home Office 2007, p.152). This was later reiterated in 2008 by the Rt. Hon Hazel Blears MP, Secretary of State for Communities and Local Government in the Empowerment white paper (2008) that, 'people should have the maximum influence, control and ownership over the decisions, forces and agencies which shape their lives and environments [and] is the essence of democracy.' (UK Home Office 2008, p.4). In essence, the political objective was to create democratic move from central control to one of devolution. The language of the Labour government between 2007 and 2008 in relation to planning talked of passing power to local communities, local decisions, and active citizens. Within the framework of both the planning and empowerment white papers, the key message was one of community engagement through the simplification of local government planning processes. The Killian Pretty Review (2008) acknowledged the 2007 Planning White Paper, while introducing a further 17 recommendations to simplify the process. Recommendation 4, and 9-12, suggest

pre-application engagement with stakeholders and local community as well as a 'fundamental overhaul of the arrangements for nationally defined consultation' (Killian & Pretty 2008, p.12). Moreover, recommendation 11 suggests that local authorities should have the freedom to publicise planning notices beyond the current newspaper remit, estimating that this would 'give local authorities flexibility to spend the estimated £15 million per year currently spent on newspaper advertisements in the way they see fit to best engage their local communities' (Killian & Pretty 2008, p.14).

By 2012, the introduction of the National Planning Policy Framework (UK Home Office 2012) reflected a changing attitude to the devolvement of the planning process, with the Framework widening its engagement and amalgamating 44 current government policies into a single framework. The reference to community also had shifted where the Planning and Empowerment papers had used the term 'community' in consideration to decision making, the National Planning Policy Framework referred to 'community' in relation to the needs of the community for housing and amenities. While the Framework still considered the need for early and pre-application engagement, as cited in the Killian Pretty report, the emphasis separates community from direct consultation, and suggests that 'pre-application discussion enables better coordination between public and private resources and improved outcomes for the community.' (UK Home Office 2012, p.45). In this sense, 'community' is seen as outside of direct consultation, and no longer central to the decision making process.

4.2.4 Open Planning project stages

Open Planning aimed to redress the planning policy obligation to engage local communities to be aware of planning decisions through a two-stage process over a period of 6 months. The initial, 3-month consultation with local government planning officers and local community groups was staged with the primary aim of understanding how communication and engagement is conducted. The second stage was to work with the community groups and local government planners to design, build and test a prototype planning application that would engage the community.

The initial structure concentrated on two areas that would improve access to planning information: (1) refine and make information more accessible through the redesign of the lamp post signage; (2) the development of an online application to aggregate data that would provide a portal environment to allow the layering of data from multiple systems involved in the planning process. Both stages were designed to integrate and provide a homogeneous system.

4.2.5 Research design

My initial reaction to the project was that planning information was obtuse, bound by a legal framework of complex language and terminology that was difficult to comprehend. As the introduction of this case identifies, in order to understand the problem, one has to understand the legislation. From my observations of the council planning office I noticed the planners tightly controlled how information was distributed, this was physically through a lack of public access, and through the

obscurity of planning legislation language. The consequence of this resulted in a distancing between the council officers and the public.

The challenge in making the process more transparent was to identify what information was relevant to the public and simplify the way information was communicated. My initial response to the project was to put forward a redesign and test the planning notice. I identified there was more information that could be incorporated within the design and I suggested remodeling the planning notice based upon information that was public but was not easily accessible. The design would bring together existing data from the planning portal and frame it within a new design that allowed for greater accessibility. The intention was to put forward the case to the planning office by harvesting existing information that could be incorporated (see section 4.2.8, Redesign of the sign). The plan was to combat the ambiguity of the existing signage and make the planning data more democratic by presenting it within an existing format in a more accessible layout.

The research was intended to:

- Test public engagement and investigate how relevant the lamp post was in communicating planning applications.
- Invite public groups to a co-design workshop, incorporating the design of a paper prototype, large-scale mobile phone, the objective was for participants to assist in the design of a mobile application.

The design was intended to progress the research by raising the issues of transparency through a series of co-design workshops and a final prototyped application. In addition, interviews with community group members, application

designers as well as questions raised during planning meeting were proposed to investigate how data could be made more transparent.

4.2.6 Research methods

Initial project meetings between the Department of Architecture at Liverpool University and the Creative Exchange discussed the two-stage approach to the project. When the objectives of the project were set, a meeting between all parties including Liverpool City Council, Red Ninja and Engage Liverpool was established to set out the objectives within the timescale.

The proposal challenged the representation of the current information provided to the public as well as considering how various alternative formats could be applied. This included a redesign of the existing lamp post signage that is used by local authority planners, and an application for mobile phones and tablet devices to make the application process more transparent. Early consultation with Liverpool City Council and Red Ninja divided the project between the physical and digital representation of communication data. The Council currently disseminates planning information from the local government website, liverpool.gov.uk. In addition, it is also legally obligated to publish planning proposals in printed form, within the vicinity of the proposed development.

The physical representation of the application was defined as the paper signage that adorns street furniture to indicate the presence of a proposed building development or alteration (Figure 13). The digital application manifests within the systems controlled by Northgate, an external company employed to manage planning digital data on behalf of Liverpool City Council. This information is publicly accessible and

viewable through the Liverpool City Council planning portal website. The proposal for integrating both physical and digital was established during the first stage and month of the consultation process before the meetings were initiated with the City Council. The scope of the project suggested integrating data from the online systems into a more accessible platform that was both physical and digital, and the research was designed to meet the following objectives:

- Re-design the physical paper signage to incorporate additional Council planning data from the planning portal.
- Design a mobile application to integrate planning portal data and engage the public in the consultation process.
- Allow both platforms to consolidate information and allow data to be publicly accessible.

Early discussions about engaging the public suggested the creation of an imaginary planning application, supported with a live sign to test the engagement of the current model. I designed and created a false application *in situ* to gauge public reaction, but it was later withdrawn after both Lancaster City Council and Liverpool City Council were approached but refused to endorse the concept. Both Councils cited fears over negative publicity as they felt that they could have sustained damaging press coverage from any controversy.

During the investigation stage, a film was made to investigate the flow of information from an application's arrival at the planning offices to the lamp post sign installation (Figure 12). The documentary was filmed by staff at Liverpool University, and I later edited the footage and published the outcome at the

following address: <https://vimeo.com/112414443>. The film complemented the blog posts that I wrote to publicise the work of the department and to show the progress of the project. The film and linked article can be viewed on the blog post submitted through the Creative Exchange website:

<http://thecreativeexchange.org/activity/day-life-planning-application>

Documenting an application moving through the Planning Department highlighted how labour-intensive and paper-driven the mechanism was; the progression mapped the paper application through the office management workflow that reflected the 6-week duration. The procedure began as a physical application and resulted in a digital artefact, in which the planning team had to physically draw on, highlight and delete text within the document to make it available digitally. During the first stage of the project, the Council and local community groups were consulted to ascertain their perspectives on the applications process. The outcome of the initial stage was instrumental in determining the second stage development.

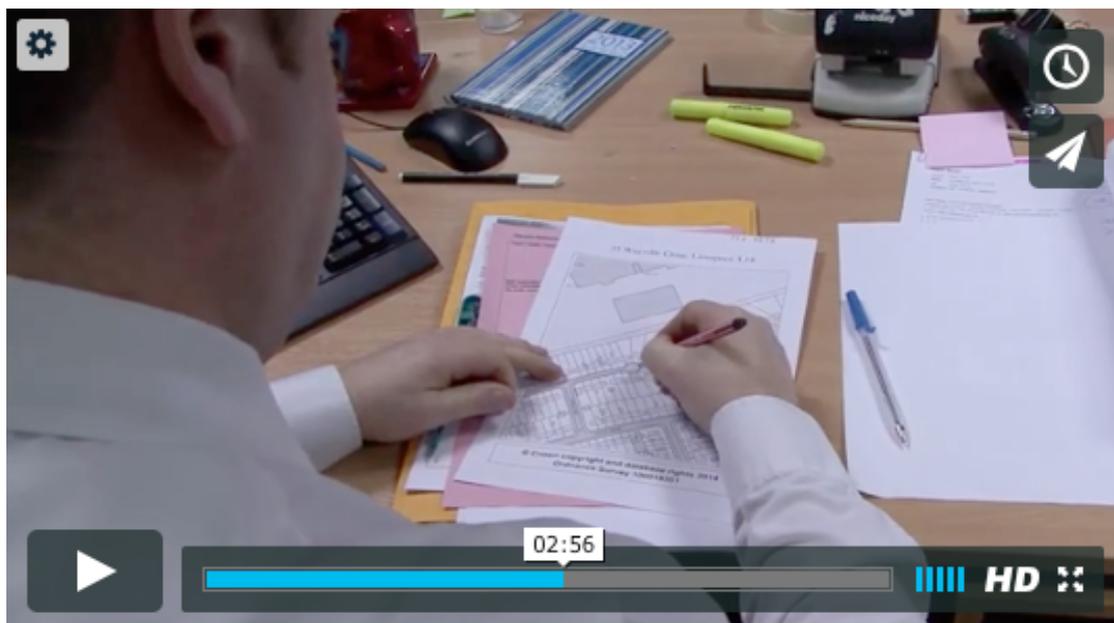


Figure 12 Documenting the planning process, <https://vimeo.com/112414443>

4.2.7 Stage 1: Consultation for redesign of the lamp post sign

Consideration was taken into account about how the lamp post sign was designed and used in its current form. The lamp post sign was seen as a valid format and a democratic way of broadcasting the planning message. Replacing the paper sign would potentially render any new signage invisible as the representation of the lamp post itself has become symbolic of the planning process.

The majority of the content of the A4 sign covers the legal framework and provides the public with an overview of how to contact the planning department within the 21-day consultation period; the rest of the sign describes the intended development process in legal terms. The date posted area is hand-signed by the individual responsible for posting the sign *in situ* as the office often produces the paperwork earlier than required. Therefore, the sign must be dated and posted to indicate a start date at the beginning of a 21-day consultation and also state the end date to the process.

Despite the availability of 24 items of publicly accessible planning data via the Liverpool Council planning portal website to be included on the notice, only 6 items are currently available within the printed lamp post sign (see table 6, current and redesign use of planning data).

These include:

- Proposal of change or development
- Location
- Closing date for receiving comments
- Legal framework
- Reference number

- Contact details
- Date posted

4.2.8 Redesign of the sign

I redesigned the lamp post sign to incorporate the current legal requirements and added additional data obtained from the planning portal website (Table 6). A grid structure was created to encapsulate information into grouped areas of interest. Images were obtained from the planning portal and were incorporated to highlight the view of the site before and after the planning scheme. Observing the current design highlighted the fixed structure of the sign that is indiscriminate, whether the planning application is a small amendment to a building, or a large corporate development. This was taken into account when designing an alternative solution, and scale was introduced to indicate the type of development. The design provided a layout for additional information that is publically available but not utilised within the current structure. I designed the signage with the intention of supporting the Council's obligations on openness (Planning and Empowerment White Paper, 2007) by making planning applications more accessible to the public with the added aim of reducing the number of telephone and email enquiries to the City Council planning department. Additional considerations, such as shifting the emphasis from legal agreement to audience engagement through design considerations (e.g. font weight) allow the time-dependent components to be highlighted.

PLANNING APPLICATION

REF: 13L/0822



<p>PROPOSAL To demolish 1990's extension to rear of existing building and carry out redecoration, refurbishment and alteration works to the original building, including increasing the height of the third floor windows to the front elevation and the provision of new signage.</p>		
<p>LOCATION Philharmonic Hall Hope Street Liverpool L1 9BP</p>		
<p>COMMENTS MUST BE RECEIVED BY 10/05/2013 DATE POSTED: 19/04/2013</p>		
<p>HERITAGE Grade II Listed Designed for the Royal Liverpool Philharmonic Society by the distinguished Liverpool architect Herbert J Rowse and erected in 1936-39.</p>	<p>DESIGN Refurbishment and improvement of the accommodation so as to maintain, attract and deliver an excellent and wide ranging programme of activities Ensure that the Liverpool Philharmonic recognises, retains and grows its funding and donor base, and continues to attract investment at a local, regional and international level</p>	<p>SUSTAINABILITY Ensure that the Liverpool Philharmonic recognises, retains and grows its funding and donor base, and continues to attract investment at a local, regional and international level.</p>

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Figure 13. Original laminated sign (left) and redesign (right)

As a test case, I selected a planning application relating to the Liverpool Philharmonic Hall (See Figure 40. Redesign of the planning notice for the Liverpool Philharmonic Hall), this was chosen for its significance within the City. It was also selected for its personal impact as a landmark building within the City of Liverpool. Due to the complexity of the project, a selection of documents was chosen for the redesign from a set of 79 documents connected within the application. The initial redesign that was created utilised content already publicly available on the Liverpool City Council planning portal website, and despite the content in the public domain, it was not easily navigable or in an easily readable digital format. Files were stored in PDF (Portable Document Format) but were not labelled with any formal descriptive

naming convention and the files retained the original filename from the developer and applicant. The complexities of the naming convention is demonstrated in the file, '308_P_L214_01.pdf', which contains a proposed side elevation plan drawing of the redesign for the Philharmonic hall. This issue related to all the subset of files pertaining to the plans, rendering the reading process problematic.

While the size of the sign was consistent with the current model, the amount of data was doubled in the redesign. The chart below demonstrates the current content available on the left with the additional structure for changes to the signage on the right.

Table 6. Current and redesign use of planning data (Bold text indicates new content)

Current	Redesign
Proposal of change or development	Proposal of change or development
Location	Location
Comment to be received by	Comment to be received by
	Heritage
	Design
	Sustainability
Legal Framework	Legal framework
	Existing building (image)
	Proposed building (image)
Reference number	Reference number
Contact details	Contact details
Date posted	Date posted
	Google map view
	Icon – building type/scale image

4.2.9 Testing the design

The Planning Department at Liverpool City Council initially supported the concept of the redesign of the signage, and agreed it was an improvement on the current model (Open Planning Minutes 11/05/2013). During conversation with the planning officers, initial observations of the current process led to a suggestion to make all data publicly available outside of the current portal system. However, criticism during the consultation process highlighted that, although data is available through the planning portal website, extraction is not an easy option within a government department that has limited resources. Despite being in favour of the redesign, the proposal to attach additional information to the existing lamp post sign was met with scepticism during meetings with the planning office. It was seen as both beyond the scope of the work currently undertaken by the department and problematic if misunderstood by the public. It was thought the public would consider the added text and image-based information to be final and not part of a consultative process. It also was considered that by adding images of proposed developments, an artist's impression would be seen to favour the developer and the proposed development. The planning department also voiced concerns that the process of selecting an image to represent a development could be interpreted as supportive of the process if the developer was also the individual who had submitted the specific image. In conclusion of this issue, defining an image on the lamp post sign could be seen by the public as a biased and endorsed viewpoint of the Council in favour of a specific agent or developer. Consideration was taken that while the view is subjective, a biased view could be considered by an external

audience, as the signage would be represented with the official government logo and crest.

4.2.10 Stage 2: Application development

While the Council rejected the investment into the redesign of the street signage, the design of a mobile application gained approval. A design stage for a mobile application was conducted through focus groups with partners and members of the public.

A co-design workshop was organised to indicate the type of content that was required for participants to engage in sharing information relating to planning applications. The workshop was designed between myself and another PhD researcher within the Creative Exchange at Lancaster University. The design of the workshop was intended to raise awareness and to highlight the differences between content that was currently available, and content that was currently being displayed on planning notices. The design used content available on the planning portal website, participants were invited to discuss and signify which data was more important to them. The intention was to create an environment that allowed discussion and debate about the openness of planning information and how it could be used within a mobile application.

During the workshop, participants were encouraged to identify which data they found most useful from the current model, and which additional features they would like to see introduced that would enhance the current experience. I designed a large-scale mockup of a mobile phone (Figure 14). This was designed to represent a mobile

application, with attachable data and icons to represent Web 2.0 content, with mobile phone capabilities, such as social media sharing tools, GPS and email options. The physical dimensions of the screen also represented challenges for the participants' as the phones screen was only capable of holding a specific range of information. The workshop required participants to determine how information would be displayed within the limitations of the space provided.

The mockup designs were shared between two groups who were tasked with discussing how they would engage between the physical and digital space in the planning process. During the workshop, my role was to facilitate while each group was given the task of describing how they could be more involved by redesigning the consultation process using the following statements; 'I don't live here but I do care' and 'I want to engage, not just complain'.

While both groups were in collective agreement about what they wished to develop, the second aspect of the task introduced the range of data available via Liverpool City Council's online planning portal. This task involved a card sorting exercise to define what data was important in the development of an application. The introduction of 17 separate items of data was reduced to five as the group removed any information they considered surplus to requirements during the initial consultation process (see Table 7).

Table 7. Planning data available that was supplied during application development

OPTIONS SUPPLIED FROM CURRENT DATA	RE-USED IN APPLICATION
Application name	
Coordinates (Easting, Northing)	YES
Parishes (e.g. C1, C2, City North)	
Site Address (Site address of proposal)	
Existing land use	
Proposed land use	YES
Wards (e.g. Anfield, Everton)	
Consultation expiry	YES
Decision expiry	
Case officer (contact details, phone number)	
Received date	
Development type (e.g. relaxation of condition)	YES
Application no. (e.g. 13F/1677)	
Application type (e.g. conservation area consent)	
Proposal (detail of works proposed)	
Current status (e.g. new, lodged)	YES
Agent name (name of the agent proposing development)	

Participants added additional data references such as links to Facebook, Twitter and other social media tools as a method creating impact by linking data to wider community groups. Each group then aggregated this information with the first task's wish list of maps and buttons to create a more communicative application process. The result of the study culminated in a design, based on a mobile phone screen, in which participants visualised the data into a paper prototype.

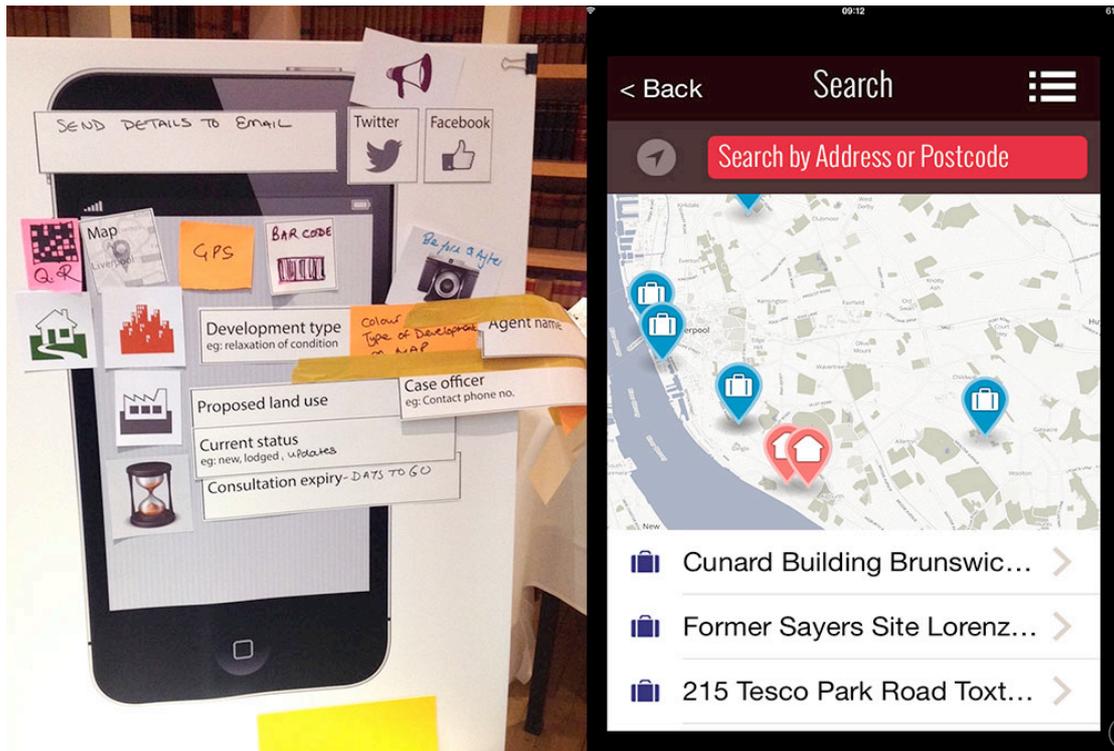


Figure 14. Application design (left) using a large-scale (A0 size card layout) and mobile phone to represent the application with final application design for mobile device (right)

4.2.11 Application design

The Open Planning data that is publicly available from the planning portal website was not as accessible as initially advised by the Planning Department at Liverpool City Council. Although the data was owned by Liverpool City Council, and managed by the external company, Northgate, it was not in an easily accessible format. The data was both incomplete, and manually managed by the external host. Northgate suggested that to obtain a clean copy of the data, additional work on the database would have to be performed. This was not as originally described and had implications for the consistency of data that would be available to populate the mobile application.

The application development company, Red Ninja, liaising with Northgate over a period of 6 months, resorted to scraping the data (scraping data is the act of extracting data from existing websites) available from the Liverpool City Council Planning website due to the difficulties in being granted access to the open data held by Northgate. The process of scraping involved taking existing data from the live Council Planning website as a means of populating the mobile application. This was achieved with no degradation, harm or awareness from the Council website as the data management company, Northgate, required additional work to make the available data accessible. While the data was officially open data, the poor consistency and integrity of the planning data available from Northgate drew questions of the future of data openness if a third party were to manage the value of the asset.

The final design of the prototype application resulted in a filtered version of the co-design process between the local community groups, the designers of the application and the Council. Neither the Council nor designers were involved in the initial consultation, but they made amendments to the final design.

The results of the co-design process were shared between the application development company, Red Ninja, and the Council during the development process. Although there was consensus from both groups during the co-design process, the co-design feedback data in the development of the mobile application (Figure 14) was restricted. Time and resources were cited as restrictions in areas where the co-design workshop had designed more complex features. This included requirements for image integration from the portal to the application; however, the Council in conversation with Red Ninja, highlighted similar concerns raised during Stage 1

design of the lamp post sign again in the use of images that could bias the perceived view of the application.

The development of the mobile application was designed based on consultation primarily from Liverpool City Council; despite the consultation and co-design workshops, the application was driven by the Council and less by community engagement.

4.2.12 Key findings

The findings from the Open Planning project revealed that:

- Information dissemination was not technology dependent; rather, a combination of mobile technology and low-tech messages was proposed.
- The Council did not support the concept of open data transparency.
- Photography and social media content that supported planning applications were problematic, perceived as non-neutral with potential to bias public opinions.

4.2.13 Planning dissemination

The research outcomes suggested new approaches to the dissemination of information that were not solely technology-led, and while the mobile application (app) was in development, the results from the focus group have shown that information held by the Council does not necessarily hold the same value to the community. Conceptual ideas from the group highlighted that while the app will assist in raising awareness of the planning process, the application will need to be created in conjunction with the existing street signage despite the reluctance from

the Council to make changes to the design. Additional ideas from the group supported new concepts to raise awareness through the physical space of a development, which would allow a more visible and public viewpoint. Innovative ideas such as soluble signage that used water based paints or chalk, painted onto pavements was suggested to raise awareness. These conceptual ideas were based upon discussions around the 21-day consultation timeframe in which the painted pavement would only be visible for a limited duration. Other suggestions such as radio broadcasts and placing adverts at public transport hubs were mentioned in the broader discussion to make planning processes more transparent.

4.2.14 Data transparency

The Council did not support the transparency of data sharing practices that the community groups requested during the co-design workshops. The outcome of the project resulted in a working model of the mobile application that utilised data from the planning portal. Planning data was automatically scraped on a daily basis from the planning portal from the app designed by Red Ninja. Due to the difficulties in accessing live data from Northgate, the only option was to scrape data that existed within the online planning portal. Unfortunately this meant that the only data that could be accessed was that which was already public and not dissimilar to the infrastructure of the existing planning portal. The delay in obtaining planning information in the development of the mobile application demonstrated the fear of sharing data, especially when data is integral in supporting public sector employment and economic growth through private enterprise. The battle for ownership between public and private was evident in the way content was not

available, despite being publicly owned. What was achieved, and what was initially suggested was heavily controlled between the developer of the application and the City Council. Neither the Council, nor the designers were involved in the initial consultation, but made amendments to the final design based upon communications from the Council. The final design of the prototype application resulted in a filtered and channelled version of the co-design process between the local community groups, the designers of the application and the Council.

4.2.15 Problematic features (from photography to social media integration)

During the earlier co-design process, the public had integrated functions into the mobile application design that are represented within existing social media platforms to allow planning data to be shared and discussed. While these functions were not seen as remarkable in the context of existing social networks, such as the ability to share photographs and to add comments, the process of sharing photographs of building sites, previous architecture, new architectural designs, and artists' impressions was determined by the Council to be too confusing and prone to provoke negative reactions.

Although there was consensus from both the application development company, Red Ninja, and Liverpool City Council during the co-design process, the co-design feedback data in the development of the mobile application was restricted. Time and resources were cited as restrictions in areas where the co-design workshop had designed more complex features. This included requirements for image integration from the portal to the application; however, the Council in conversation with

designers at Red Ninja, highlighted similar concerns raised during stage 1 design of the lamp post sign in the use of images that could bias the perceived view of the application. The development of the mobile application was designed based on consultation primarily from Liverpool City Council. Despite the consultation and co-design workshops, the application was driven by the Council and less by community engagement.

4.2.16 Analysis

The aim of the Open Planning project was to research, bring together and make more accessible the level of information available to the general public. However the challenges across the project were the anxieties in relaxing control over access to information within the City Council. While government white paper reforms are making processes for access to information more transparent, both the community group and the Council had specified perceived ideas of how information should be governed. The openness and accessibility of information was often dislocated from the intended audience, as content was strictly controlled within the framework of the controlling partner.

The information held by the Council as custodian of planning information bridged the notions of what constituted public and private, while portions of information were private for periods of time before consultation. In making the consultation process transparent, it was considered that 'any new system needs to be robust' (Head of Planning, 11/05/13). The intention to add additional data, specifically images, relied on a level of perception that was not considered 'robust' enough to withstand public scrutiny; this generated resistance to new ways to present existing

data and was therefore rejected during a closed planning authority meeting. In the example of the lamp post sign, the design never made it to a test environment, despite integrating additional public data that was available but not currently public.

Conceptual ideas from the co-design workshops highlighted that while the app would assist in raising awareness of the planning process, not embracing features that would encourage two-way communication between the public and the Council would continue to divide the two parties. While the Council feared a backlash from negative responses from visual material relating to planning development, not engaging with the latest technologies was seen to push the conversations underground. The lack of ability to engage with the Council suggested that communication would take place across the social networks rather than within the organisation responsible for the plans. The communities that currently wish to engage in planning decisions continue to use social media as a platform to gather support, and it was perceived by the local communities as unfortunate that the Council did not wish to consider the mobile application as a tool for social engagement. The application had the potential to unite the Council, developers, and the local community as a platform for interaction and collaboration, which supports the UK government's direction in open data policies. However, the Council worried that making data public would lead to a rise in misinformation, and therefore restricting access through control of the data was determined to be a safer option.

4.2.17 Conclusion

The outcome of the Open Planning project identified:

- The Council insisted on maintaining control of information.
- Control lead to a lack of trust between the Council and the public.
- Public consultation embraced social media integration.

The Open Planning study demonstrated that the control of information was maintained by a framework determined within a single department located in an office within a city Council building. The physical structure of the department reflected the inability to engage in a fluid and interactive environment to which the public was accustomed. This led to a fear of losing control of the planning data that was the preserve of the Council department. The relationship between the Council and the public therefore was perceived to demonstrate to lack of reciprocal trust. While the Council established that the planning laws were there to safeguard the public, the public did not trust the Council due to the obscure and opaque legalities that surrounded planning decisions. The results of the planning workshop revealed that the public embraced the opportunity for social media integration. However, this was not supported by the Council in the development of the mobile application. The result of Open Planning raised important questions about the integrity of sharing data online. As community groups continue to use social media as a method of engagement to gather public support it is often done without collaboration with local authorities. What this study highlights is there is a requirement for a collaborative approach in the use of public data. However, in order to prevent misinformation and mistrust the control associated with how data is currently

managed will necessitate change. This raises further questions about what constitutes data and who owns it. For example, if planning applications accept contributions from public sources, can this be data be politically neutral if content is supplied from external sources the public, the developer, and the Council? And will sharing data lead to further mistrust if data is manipulated, leading to misinformation?

4.2.18 Summary

Liverpool City Council held control of planning information and this led to a level of mistrust between community groups. The community wished to engage through social media and contribute to the planning process, however the design of a mobile application to make planning information more transparent was restricted by the Planning department within the Council who wish to keep control of the planning application data. The outcome demonstrated how fears of sharing data manifest when control is devolved.

4.3 The Physical Playlist

4.3.1 Introduction

The Physical Playlist project investigated the concept of a physical-digital object, which people would share with friends, family, and others. The idea emerged as a reaction to the demise of the mixtape that represented a personalised and shareable object. The shared, audio mixtape—a staple of many people’s music collections in the 1980s and 1990s—had an emotional and physical connection that digital, shared content often lacks. Writeable CDs came too late, or too close, to the rise of the MP3 to become a shareable, treasured object. The modern, audio listening experience has progressed dramatically with the rise of the mobile phone and tablet computer; combined with Wi-Fi and 3G networking capabilities, the ability to read, watch and listen to content anytime and anywhere is now a reality. The prevalence of music and video content accessible through various portable devices has created an environment for instant gratification and the ability to consume and discard digital content at will. The capability to share content has been replaced with the ability to stream and play content simultaneously, while the content’s value has been replaced by one of demand.

The project emerged during a Creative Exchange ‘creative lounge event’ held at Media City in July 2014. The event was designed to bring together ‘creative industries, technologists, artists, and academics to think about spaces, places and connectivity, and the digital/physical interface’⁶ and utilised creative toolkits as a

⁶ <http://thecreativeexchange.org/activity/creative-lounge-catalysing-cross-sector-collaborations>

method to encourage participation. During the creative lab event physical objects such as modeling clay allowed participants to actively create ideas in physical form.

The outcome of the project was the collaboration between Lancaster University and BBC Research and Development in Salford, UK, and the project utilised access to BBC iPlayer content from the BBC online archive of broadcast material as a method of sharing data through alternative technologies.

4.3.2 Simulating analogue

The analogue device that was produced to play audio and video content has been replaced with an emulation of a previous manifestation in the digital space; objects that are encountered in the present occupy the digital space as if they were still real. The physical analogue objects of the past now manifest as a representation of a physical object in the digital space. The term 'skeuomorph' (Knappett 2002) is used to describe this phenomenon, in which 'an object or feature imitates the design of a similar artefact made from another material' (Oxford English Dictionary, 2015). The term was used to describe more specifically 'the manufacture of vessels in one material intended to evoke the appearance of vessels regularly made in another' (Rotroff 1995); however, there are non-physical objects that can be defined as skeuomorphs that occupy the digital space as if they were still real. An example is the iPad podcast player, which simulates the reel-to-reel cassette player of the 1960s. This stylistic referent to the past also represents a visual function, indicating that what is being listened to has a finite time limit. The virtual tape in the machine signifies the time taken and time left, while buttons show the physical push button mechanism of a machine of which modern generations have little experience. The

familiarity with the past is also manifest in the comfort of the virtual record collection and readers' bookshelves of the subscription service of Apples iTunes. Skeuomorphs may also be represented as symbols that represent an action that was once performed in the physical space that is now performed in a digital space. The 3¼-inch floppy disk symbol in word processing software represents the action to save a file, the scissors to cut, and the image of a clipboard describes the physical action to paste. In this context, the term skeuomorph is used to describe the representation of an object that can be both physical and digital and that is depicted as a metaphor of an object from the past.

4.3.3 The research process

The Physical Playlist project aimed to rebuild and explore the relationship between the physicality of a device that reads digital content (a reader), and a physical object that has digital content embedded within it. The project sought to build a series of shareable, personalised objects, and to create a digital platform through which digital content could be shared, thus allowing content to be designed, shared and read through an object reader. The project took the modern experience of instant content and strategically designed out the ability to fast-forward, rewind, pause, skip, or jump through digital content. The intention was to challenge the recipient to listen to, or watch the entire collection of content presented to them in the sequence in which it was intended.

The research process was divided between the design process that focused upon the mechanics of the physical reader and the data object, and the study of how the objects would be used if they were shared. I was interested in the use of the objects

and how data would be shared. However, in order to progress the research the design of the reader and object was a critical component in the research process.

4.3.4 Designing the reader and the object

The reader and object progressed through the following design stages:

- Design lab – using creative toolkit
- Design meetings
- Digital and paper prototypes
- Laser cut acrylic prototypes
- Creation of mobile phone application
- 3D printed mockups

Initial design meetings with colleagues at Lancaster University resulted in preliminary sketches of the reader and object. I later took these designs into Photoshop and created a three dimensional representation of the reader based upon the early discussions (see Figure 15). The design shows a vertical mechanical arm that is connected to a base that rises and falls to read data from a series of hanging objects. This design was then built using laser cut acrylic by colleagues within the team. Figure 18 reveals the internal workings of the device and shows the arm of the reader holding the sensor that was designed to rise and fall as it read data from personalised objects. As the discussions progressed the concept of the data object was finalised from its original ambiguous state to a physical form. The object was defined as a bracelet in which data could be embedded, swapped and shared. This is represented within figure 16 that reveals the early designs and the final 3D printed prototypes (Figure 17). In order to fulfil the design of a bracelet I researched jewellery designers working with 3D printing techniques; this resulted in meeting

with, and later employing, the company Code3D based in Sheffield. The company was tasked with making a bracelet based upon the initial design concepts that required digital content to be embedded within each link that could be removed and later re-installed.

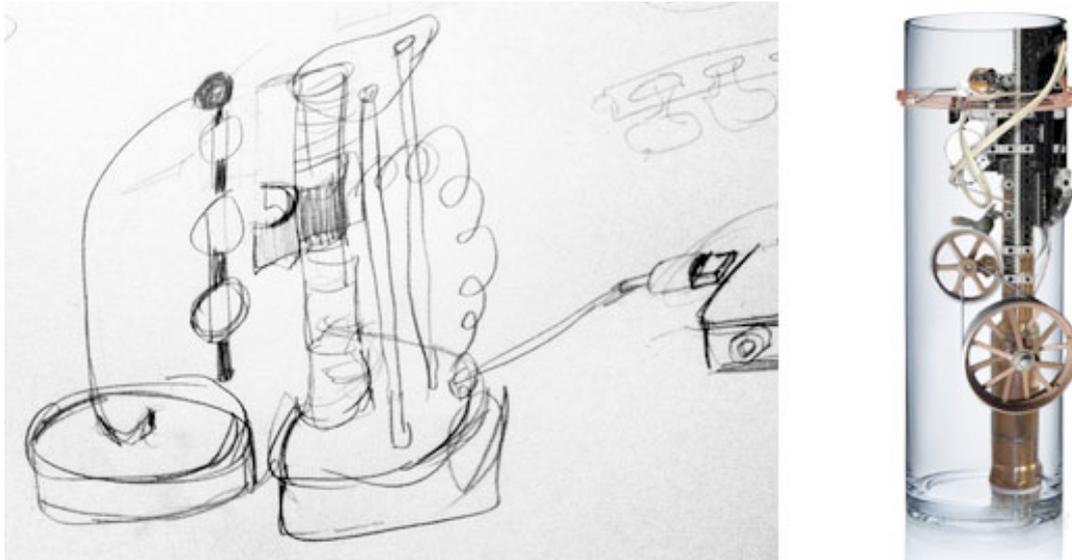


Figure 15 Design sketches for physical playlist player

4.3.5 The technical process

The Physical Playlist project began with a design idea, to create a physical and digital combined experience that brought the digital content into a physical format. The design of a physical object, containing digital content, was built upon the premise that the object could be shared and worn by the recipient to investigate how the ownership of personal data affected sharing. The creation of a bracelet (Figure 17) was adapted to hold a series of objects, and each object contained a Near Field Communication (NFC) tag that held the digital data. NFC tags are commonly used in security passes for door access and for stock control systems; the technology is also increasingly available within mobile devices for wireless device-to-device communication and contactless payment (<http://nfc-forum.org>: 2014). The NFC tags

created for the Physical Playlist project used a series of sealed waterproof tags, which could be embedded into an item of clothing or piece of jewelry and worn without the content being damaged over time. The challenges for the designers of the bracelet was the intricate nature of the object that held the tags in place, early models of the design broke at the hinges while attempting to remove and insert the NFC tags (see figure 16).

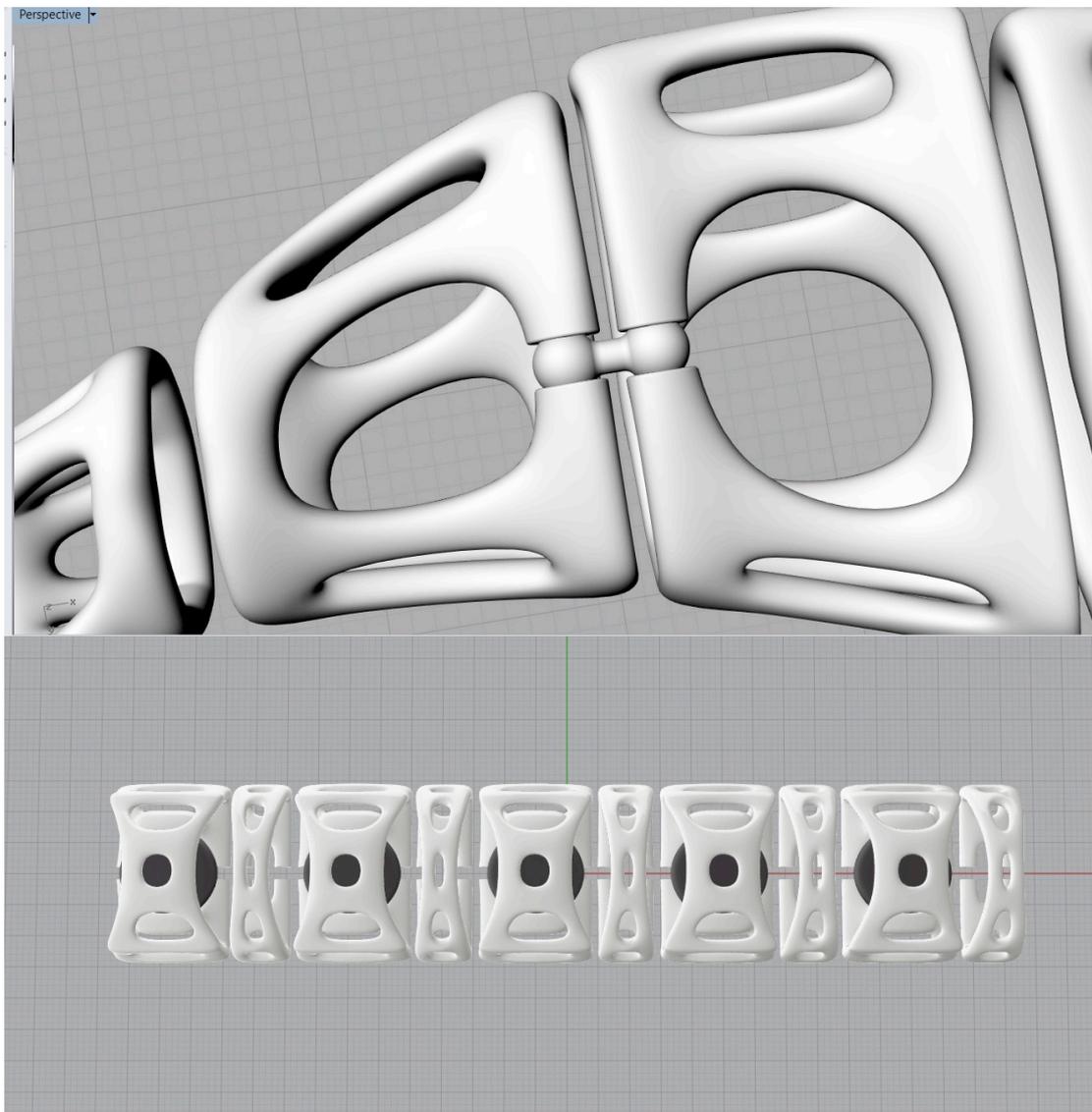


Figure 16 Early 3D concept designs by Code3D, Sheffield



Figure 17 Bracelet designs for the Physical Playlist, prototype (left) and 3d printed final design incorporating NFC tags designed by Code3D in Sheffield (right).

A mobile application was developed by a member of the design team that allowed each tag to be embedded with a link to either an audio or video file. During the tagging stage, three options were given that allowed the participant to choose between a link to Spotify, YouTube or BBC iPlayer content. The participant had the choice to embed content by first searching for and identifying the content through the mobile application. Once the content was selected, the tag was scanned in order to download the data from the search result. Each tag then could be arranged within a series of tags that created a digital playlist, similar and in the spirit of the mix-tape.

During the design stage of the reader, considerations of real-world scenarios that affect objects in the physical world were taken into account (e.g. audio cassettes in which the tape would stretch, distort or snap). Ideas also were suggested that went beyond the scope of the analogue object but could be implemented in digital form; this included the implication to only be able to listen to a track once, or during a specific timed event or physical geo-location. An example is the film *Star Wars*, released in 1977, which has many meanings depending on which generation

experiences it. In this context, the issue is in which order should one watch the film? It can be watched in chronological order, starting in 1977 with episode 4, or narrative sequence order, beginning in 1999 with episode 1. It was implied that the film could be watched in the context of how it was watched from 1977, with a three-year delay between each of the trilogies and then a delay of sixteen years, which represents the duration between episode 6, in 1983 and episode 1 in 1999. The implication was that a bracelet of physical objects representing each chapter of the film, could be watched in sequence based upon a specific viewpoint, and each film would be unlocked and played through the object reader in succession on specific dates.

While the distance in time could be measured between the historical referent of the film, *Star Wars*, as a historic document, time was also a factor in the design of the playback function of the reader. The design and build process of the object reader borrowed examples from the history of audio playback equipment as well as considering how content was physically shared in the past. The project took references from both mechanical record and cassette player devices, while taking into account the functionality and time taken in the audio listening experience. In the same way a 90-minute audio-cassette took 4 minutes to rewind, the player was designed to take the same time to reset back to its read-ready state as a rewinding cassette. The concept of a mechanical physical object reader was devised that would scan objects in the same way a record player read grooves on a record.

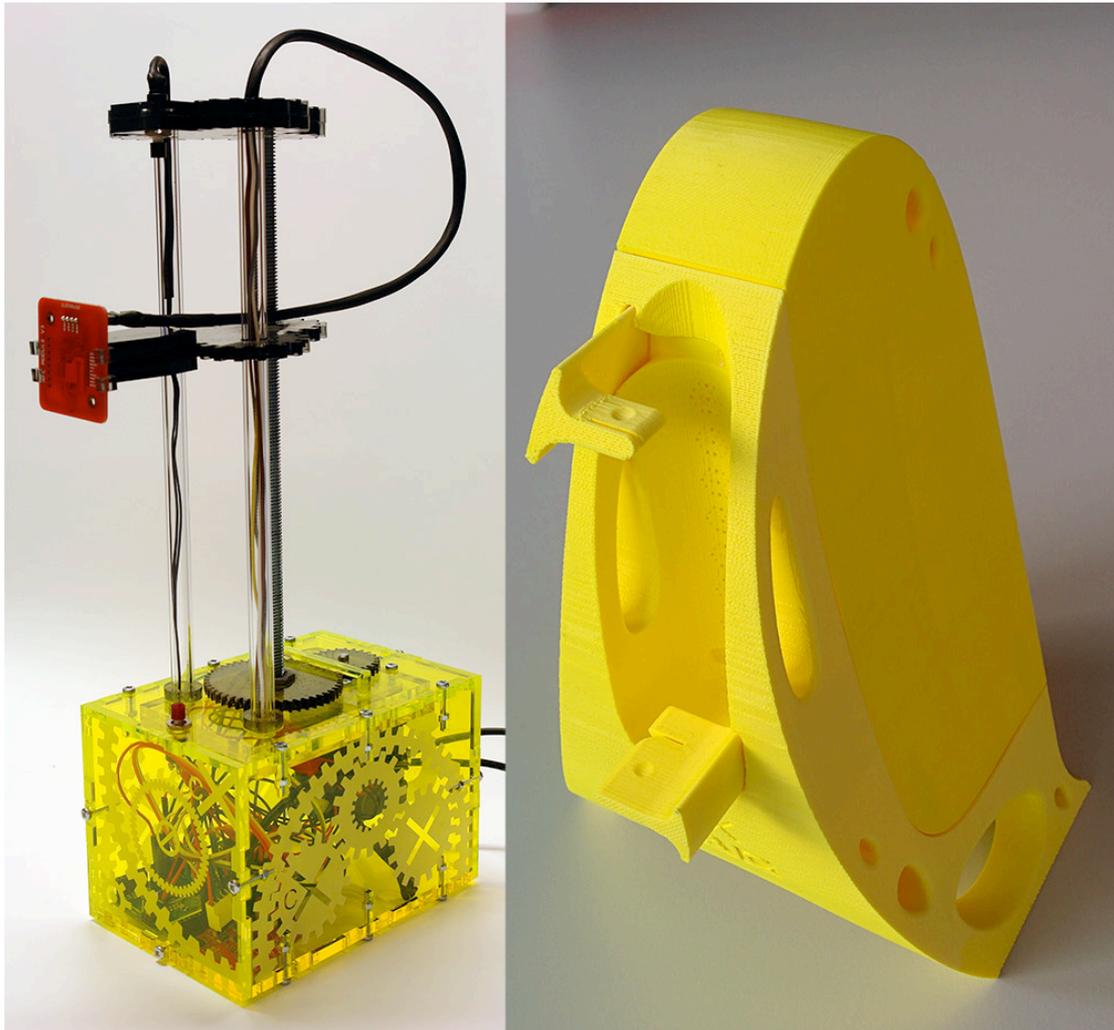


Figure 18 Physical Playlist player prototypes; laser cut plastic (left) and a later 3d printed prototype (right)

The reader (Figure 18) was constructed from acrylic laser cut parts and assembled upon a motorised platform supported by vertical rods; a simple, yet elegantly effective threaded central column solved the problem of maneuvering the card reader from top to bottom as it scans a series of NFC tags. Rods positioned either side of a threaded helical arm stabilised the reader as it read a series of physical-digital objects. As the mechanical motorised arm slowly progressed along a string of physical objects, each embedded with a digital NFC tag linking the physical to the digital file, the process encourages the participant to slow down, while they are forced to wait for the arm to reach the next track, play and move to the next.

Safety buttons were installed at the top and bottom of the reader so that it could identify the position of the head and could reset the arm back to its read-ready position at the top of the platform. The whole mechanism was controlled from an Arduino that controlled the mechanical movement and a Raspberry Pi that controlled the audio and video tracks and playlist while creating a connection between the card reader and the object. The rationale for initially using laser-cut acrylic meant that parts could be easily recut and redesigned as the design process evolved. A rapid prototyping approach to the build and test stage was adopted that allowed a more fluid approach to the design of the reader. When the design was functional, a secondary skin was designed using 3D printing processes to encase the mechanical device (Figure 18).

The BBC Research and Development department influenced the design process and content decisions. Initial development indicated the two major audio and visual streaming services as Spotify and YouTube; however, the BBC suggested the ability to showcase the BBC iPlayer content would be advantageous within the organisation. There were complexities in accessing all three content services and, while the BBC was a partner in the project, internal access to the BBC iPlayer was not available outside of the organisation, requiring additional work on the code to be carried out within the player.

4.3.6 Research design

The design and build of the player and objects that accompanied the player were created with a primary aim to raise questions about the way in which content is experienced and shared with the demise of the audio cassette and mix-tape. Research was conducted through a series of workshops to investigate how digital content could be physically shared, to create the opportunity for participants to build a series of bracelets embedded with NFC tags and to create a platform for sharing digital content. Some of the early questions around sharing content concerned whether individuals are willing to embed and share their own content in the same way the audio mix-tape cassette allowed personalised shared content. The concept of sharing personal content is not an unusual experience; however, will users savour the content and share the experience in the same way the mix tape was created?

4.3.7 Research methods

The methods implemented within the project include:

- Questionnaire
- Observation
- Prototyping

Through a series of workshops, I investigated how participants would react to sharing personal data embedded within physical objects. This raised questions about trust and the relationship between the physical and digital nature of personal data. Participants were offered the opportunity to share music, films, text, photos, phone contacts, health data and other content by creating their own bracelet.

Twenty four participants were invited to answer a series of questions in which they would create visual links between content and a series of actors, consisting of family, friends, and colleagues. I designed the questionnaire to fulfil my overarching research questions relating to data sharing. I was interested in whether the proximity to the physical object would affect the way individuals perceived sharing personal information. The workshop and questionnaire was introduced during the Mozilla technology festival in London in October 2014.

The questions included:

1. What content would you share?
2. Who would you share it with?
3. How do you share content now?

In answering the first and second questions, participants drew physical links between content and the series of actors, and then repeated this step again during the third question to indicate how content was being shared currently. I designed the questionnaire to be visual (Figure 19) rather than textual in order to create a direct relationship between personal content and with whom it is shared, by making the participant physically draw the relationship between content and ownership. Doing so created a faster and more direct understanding about how data is shared in a collaborative environment.

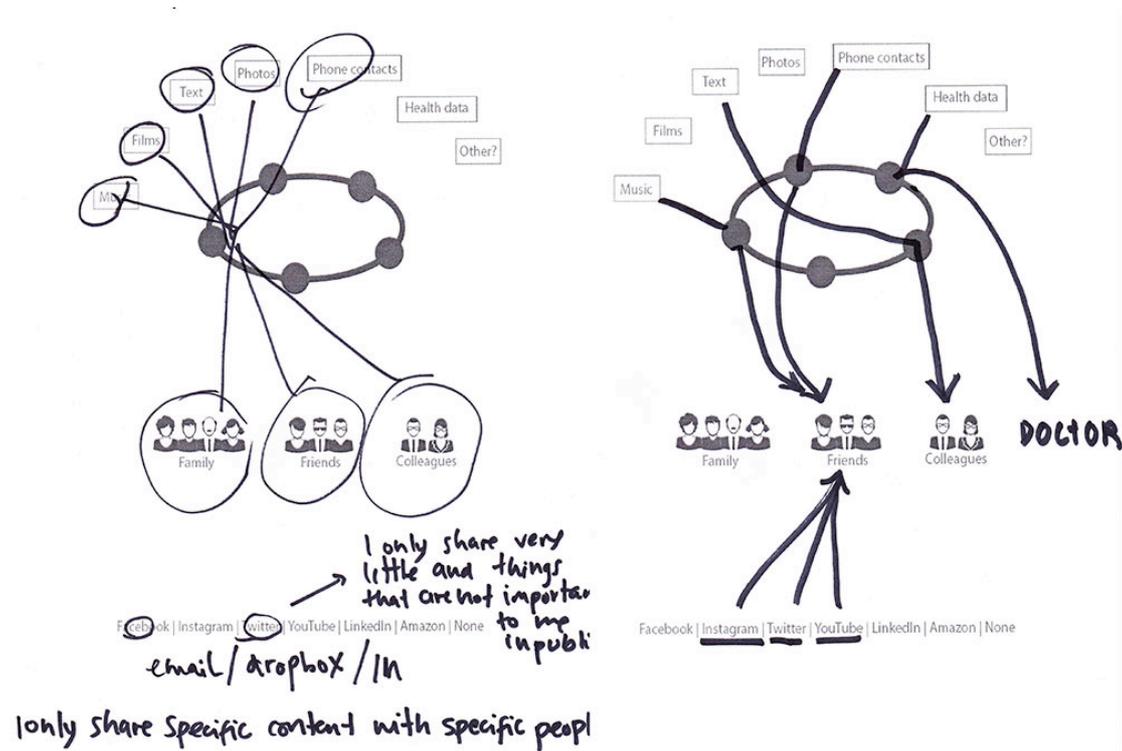


Figure 19. Visual questionnaire design with responses

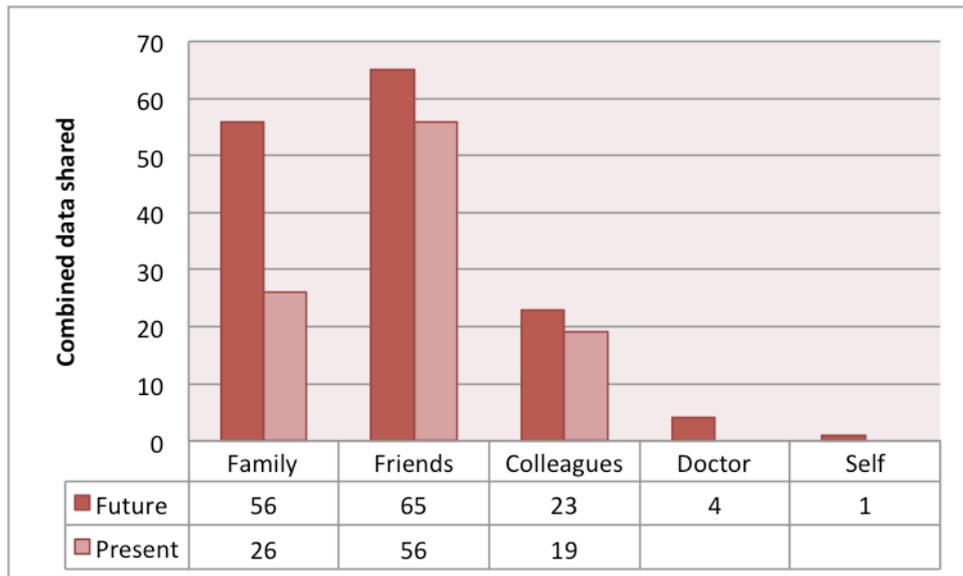


Figure 20. The relationship between present and future sharing habits

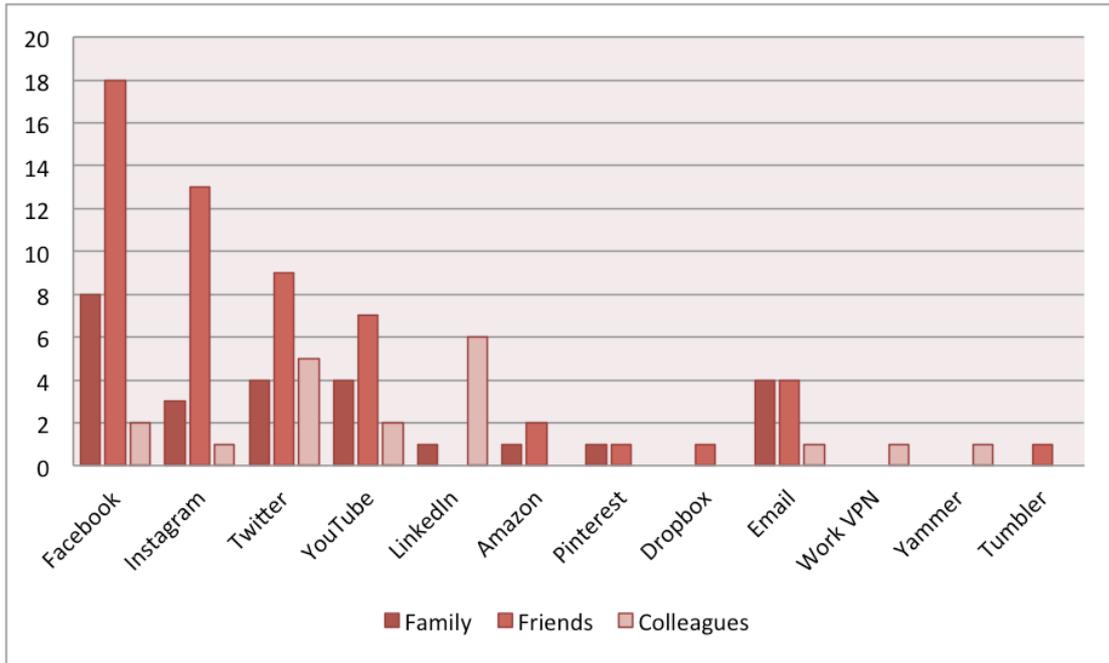


Figure 21. How content is currently shared online between family, friends and colleagues

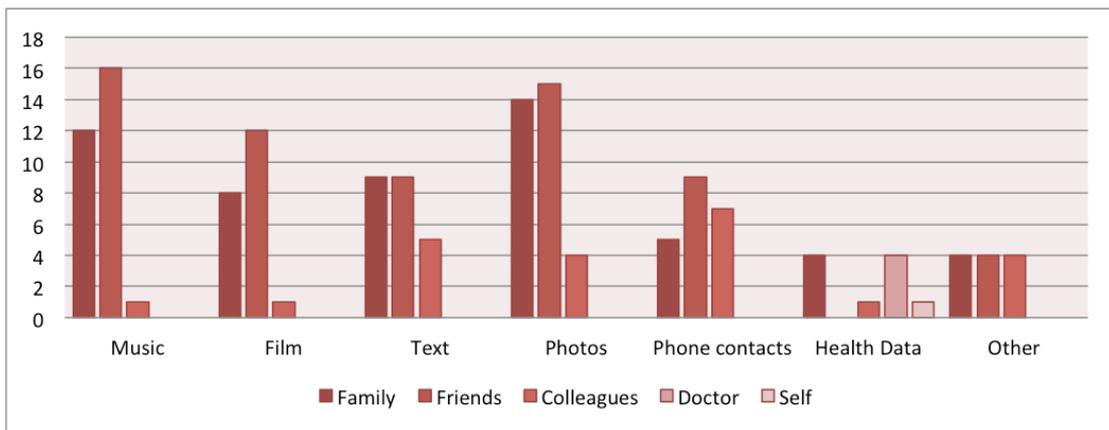


Figure 22. How content would be shared with the bracelet

4.3.8 Key findings

The findings identified that people are currently sharing content using a series of online applications with friends, family, and colleagues (See Figure 20, 21, and 22), predominantly using Facebook and Instagram as the primary route for information sharing. With the introduction of the bracelet, the potential for data sharing increased. In the example in Figure 20, the majority of digital content was shared with friends; the number of different data types being shared represents this. The

results of the future sharing practices reveal that 63% would share photographs with friends, 58% with family, and 16% with colleagues using the bracelet. This was followed by music in which 66% would share with friends, 50% with family, and 4% with colleagues. This compliments the Pew results in Figure 3 (page 36) that reveals that photographs are the dominant form of data being shared online.

The introduction of the bracelet increased the potential for data sharing, with suggestions that health data and other data sharing practices could be adopted using this method. The range also increased, as 16% of participants indicated they would share health data with their doctor. The bracelet offered opportunities for participants to take ownership of content with which they felt they had a physical affinity, as opposed to the current shared experience of uploading content to an unknown location. Others suggested the sharing of content with actors outside of the control group, such as a local doctor or health authority. In response to sharing health data, participants identified that they may not wish to wear an object that held their own personal information, but thought it would be useful with an elderly relative who they could remotely monitor.

Other possibilities identified the bracelet as a 'life story band' that could be worn and shared and contained a person's history in a physical and digital form; a bracelet curriculum vitae, containing encrypted personal information and career data, such as text, video, audio and web site links that could be sent to a prospective employer; and a customisable wristband that could hold a personalised profile that replaces a name badge at conferences in which each wearer could share data within a conference with other delegates using NFC and mobile phone connectivity.

The results of the study show that, while users are already currently sharing personal

content with friends, family, and work colleagues through digital platforms, if content was made physical it was more likely to be shared within a larger pool of contacts.

4.3.9 Analysis

The Physical Playlist project revealed that embedding personal content into physical objects:

- Increased perceptions of control over personal data sharing.
- Increased the range of data types individuals were willing to share.

While the research outcomes investigated the recipient's reaction to physical content embedded within tangible physical objects, it also created an open platform that allowed participants to consider future opportunities for wearable digital content and how such devices would be shared amongst friends, family and colleagues. The process demonstrated how content could be digitally enclosed within a physical object and gifted to a friend, who would, upon receipt of the object, replay it in the order intended by the person who had created it.

The origins of the mix-tape are connected to deeply personal and private memories that are linked to both the design and content of the audiocassette. The Physical Playlist project considered the memorialisation of the physical object in which the author carefully constructed the mix-tape through personalised music and design choices that resulted in fixed-track listings connected through the physical object. By demonstrating the conceptual idea for a new form of mix-tape, the research allowed participants to engage and to explore and share new possibilities.

4.3.10 Increased perception of control

Physical Playlist introduced a theoretical and conceptual way to share personal content with digital objects. Creating an environment that offered the illusion that personal data would no longer be stored and controlled off-site (in cloud spaces), enabling the user to construct personal content that could be shared in physical objects. The result created a sense of control and trust by embedding digital content into a physical object that was an emulation of a close, and therefore trusted, possession by its owner. Participants were aware of sharing personalised information online and had concerns about ownership of content; however, the introduction of a wearable, physical object suggested that proximity and tangibility prompted an increased level of control by the participant. The bracelet offered opportunities for participants to take ownership of content with which they felt they had a physical affinity, as opposed to the current shared experience of uploading content to an unknown location. Participants increased their level of data sharing based on their current experiences when they had the ability to take control of how it was managed. This study revealed a greater ratio of shared personal content amongst family, friends and colleagues if the data could be embedded within a physical form (See Figure 22).

4.3.11 Increased data range and data types

While, users were intrigued by sharing audio and video files, they also suggested alternative possibilities that had not been previously represented in digital form. Participants were aware of sharing personalised information online and had concerns about ownership of highly personal content such as medical information.

By making the sharing of digital content physical, people were more likely to share digital content in a physical space and were less likely to share the same content within a digital space. The physical proximity to digital content was perceived to offer users greater control over how data was shared. The outcome of the study illustrates that 16% of participants indicated that they would be willing to embed medical data into a physical object that could be shared with their family or doctor. What this highlights is that, while users saw the physical object as a unique way of sharing personal and private information, they recognised that new forms of data could be embedded that did not rely upon the terms and conditions that are entrenched within current online sharing platforms.

4.3.12 Conclusion

Physical Playlist created a platform for future opportunities in data sharing through wearable technology; the technology created a platform that was perceived to be trustworthy as the user had greater control of who had access to the data object. The physical proximity to data embedded within a wearable object created a perceived level of trust. The trust in the object increased the type of data individuals were willing to share. This progressed beyond sharing music and video choices to a range of information, from personalised curriculum vitae to medical and health data. The conclusion from the analysis of the project indicates that trust in data sharing is linked with the proximity to the data source.

4.3.13 Further questions

Physical Playlist raised further questions relating to the nuances of sharing personal data. Just as Chattr demonstrated a fear of engaging in an environment that was perceived as untrustworthy, Physical Playlist revealed that the proximity created a perception of trust. This raises further questions as to whether data is fully understood by the public. As the distribution and storage of personal data is frequently described as held within clouds and farms, further research into what it understood to constitute personal data may be required. Questions such as: Do you have access to your personal data? And, what does data look like? Maybe a starting point to further research.

4.3.14 Summary

Physical Playlist created an environment in which personal data could be embedded and shared between individuals. Using participatory workshops to encourage individuals to explore how personal data can be shared, the outcome revealed that individuals were more trusting when they took personal control of how data was contained.

4.4 TILO

4.4.1 Introduction

TILO was a screen-based information system that was trialled within FACT, an arts venue consisting of a gallery, cinema and café based in Liverpool, as a mechanism to promote and inform the audience of cultural events within the venue. The project was a collaboration between FACT in Liverpool and the company MeYouAndUs, who were responsible for developing the TILO system. MeYouAndUs have described the system as a ‘hybrid display system for Arts and Cultural venues’, the aim of which is to promulgate to a wider audience an understanding of the venue’s function and identity. Dr. Gareth Harvey, a lecturer in consumer psychology at Glyndŵr University, originally instigated the research within FACT around the function of the TILO screen. His original aim was to investigate user behaviour within the cultural venue. The research conducted by Dr. Harvey was subsequently joined with research from the Creative Exchange, which brings additional perspectives of knowledge exchange to the project at the request of the funding body, Nesta (Nesta 2015). The project identified three stages to the research:

1. Stage 1 (25-31 January) was designed to investigate the space with no screens installed.
2. Stage 2 (9-16 June) with screens installed but no interaction, delivering information only.
3. Stage 3 (27 July – 2 August) with interactive screens to investigate participation.

Each stage was identified to measure difference between time spent in the space where the screen would be installed, and when the screen was installed to gauge reaction to the screen in passive and interactive states.

The research schedule designed by the Creative Exchange considered the space and environment of FACT from a holistic viewpoint that differed from Dr. Harvey's original quantitative methods. Dr. Harvey had installed motion cameras to capture the movement of visitors who occupied a specific area of the gallery complex during stage 1 of the project. The cameras were primed in anticipation of the TILO screen installation and captured movement of visitors to the gallery space (Stage 2 and 3).

During Stages 2 and 3, the camera observed the space and returned a numeric value from analysing whether visitors had stopped or dwelled for an amount of time within the boundaries of the space. This data identified whether the person was male or female and logged the duration of the dwell time. However this data was not capable of identifying returning visitors.

4.4.2 Research methods

In contrast to the study of the space by Dr. Harvey, my research undertook a qualitative focus, concentrating on visitor reaction and perception to the physicality of cameras and screens capturing information within the space.

I used a range of methods including:

- Observation, using diary and photo studies
- Photography, still and time-lapse
- Intervention, using the screen as the catalyst

- Interview and questionnaire

During Stage 1 I identified key methods for investigation. I studied visitor movement using observational research methods such as diary and photo studies to document the café and cinema audience. This informed the later use of mixed methods. With the screen installed during Stages 2 and 3, I continued to use photography as a method to record visitors' behaviour within the space. This ranged from images of people engaging with the screen, as well as creating a time-lapse of the space over the course of a day. The use of the TILO screen also became the catalyst to explore reactions to the space. While the study was designed to investigate the introduction of an interactive screen to the space, the screen became a research tool for exploring the space and experience of FACT. Interviews were also conducted during stages 1, 2 and 3 to identify visitor reaction to the TILO screen.

4.4.3 Observation

During stage 1 I observed and documented the space over a period of three days in which all human movement within the FACT building was recorded in diary form. The example below demonstrates a level of detail that was used to initially identify movement; the process also was instrumental in the development of initiating a visual method that would capture the same movement in a both a more scientific, objective way. The process of introducing a less obtrusive method was a conscious decision to remove the researcher from the position of participant observer.

An example of using non-participant observation in TILO:

11:35 A man arrives and replenishes the leaflets at the box office.

11:36 A large group of students arrive, architect students from UCLAN.

There are approximately 40-50 visitors.

They fill the space and head to the café. They take photos with camera phones. One has a DSLR, others are using tablets. They are also taking selfies. A flash goes off, they are waiting and taking photos.

They sit on the boxes outside the box.

They rearrange the boxes and sit down.

They move on and return the box seats.

11:45 Deliveries for the café arrive.

11:46 Two couples arrive and take leaflets from the box office.

11:47 A man looks at the exhibit. He reads the information on the wall.

He takes leaflets from the box office. A woman looks at the video of the banner being made. The woman goes to the box office.

The woman joins the man at the clocking in exhibit and leaves.

4.4.4 Photography

Photography was used as a method of investigating how visitors used the space within FACT. This ranged from still photographic images used as a photo document to the combination of thousands of images in the construction of a time-lapse sequence (see Figure 24. Time-lapse photography taken at FACT, Liverpool documenting user access and movement). Figure 23 depicts a series of images taken within the café at FACT; observing the café photographically demonstrated how visitors interacted, and how the café environment adapted and changed to accept shifting methods of use. Photography taken in the space depicts a snapshot of each table within the café, taken from the same perspective in a process of recording a visual note of visitor behaviour. Each image can be described in the sense of how visitors to the café use the space, how they combine food and work in the same space, what type of computer was prevalent in the space and whether they were sharing the space or alone; in essence, the photographs of the café tables documented the interaction between people and place.



Figure 23 Snapshots of user activity at 28 tables, FACT café, Liverpool.

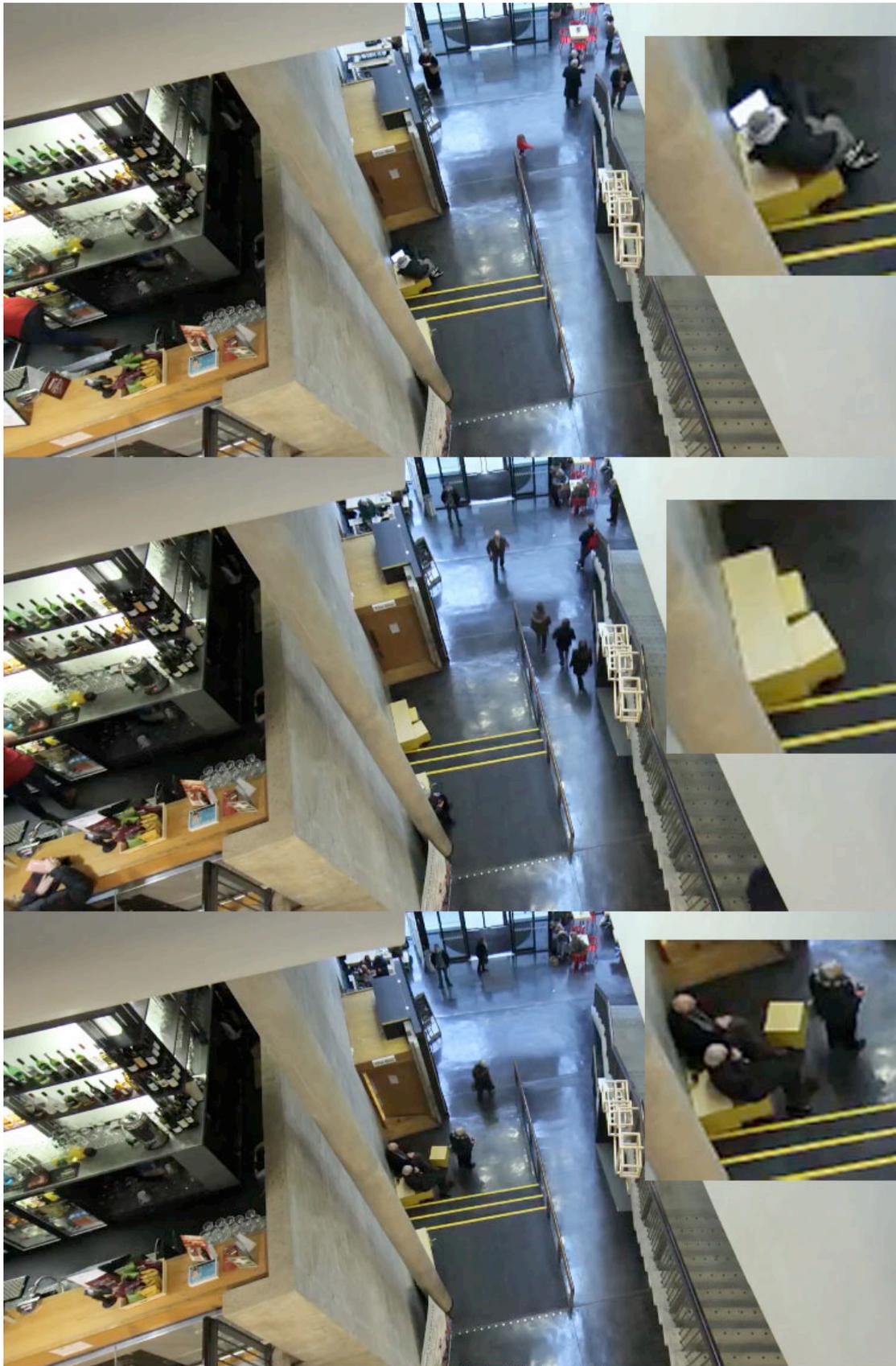


Figure 24. Time-lapse photography taken at FACT, Liverpool documenting user access and movement

4.4.5 Time-lapse photography

Photography was also used to create a time-lapse of the environment. This was automated over duration of six hours, from 11am until 5pm, to coincide with the opening hours of the gallery space. A photograph was automatically taken that recorded visitors to the building; an excess of 4,000 images were taken over the duration of an average day. The purpose of using this method was to indicate the flow of movement within the space. To accommodate the ethical issues of recording visitors, a slow shutter speed was used when photographing the space. A slow shutter speed, less than an 60th of a second, would blur any movement and offer anonymity to those that were captured during the time-lapse sequences.

While thousands of images were taken, the only subjective viewpoint was the direction in which the camera was placed. The use of a super-wide lens covered an angle greater than the viewpoint of the human eye which removes any additional subjectivity that may occur while using photography as a method. Together, all the images form a time-lapse which is the result of a photographic process that represents the movements of all visitors over the duration of the study. The individually-numbered images require additional software to compress the photographic image into a single flat file that represents the space in a movie form that shows the space in a hyper-real, speeded up version of real life. Combining the wide view of the camera lens with the compression of the day into a series of moments created a document that reduced the time frame into approximately 9 minutes of movie time. This was far removed from the subjectivity and traditions of

a photo-documentary practice. This is photography reduced to the level of CCTV and the speed camera.

While photography continued to be used across all stages of the project in recording visitor movements, the TILO screen was also used as a method of interaction with visitors.

4.4.6 TILO: interactive artist layer

The TILO interface was equipped with an additional layer that allowed an intervention and substitution of standard content within the screen. This additional layer is defined as the 'artist layer' and allows commissioned artwork to be screened between traditional marketing and public information driven content. Forming part of the research methodology, the research focused on using the screen as the central interface between the venue and its audience to challenge the preconceived ideas of privacy, identity, data sharing and the use of smart environments in digital public spaces. The intention of the research was to conduct the following research processes sequentially:

- 1) A rapid, ethnographic study of the space to assess the environment and the visitor experience before and after the screen and schedule were implemented (Stage 1). As part of the ethnography, a series of interviews also were conducted to assist in gauging the visitor response to the screen (Stage 1 and 2).
- 2) Exploring the possibilities of visitor interaction and reactions in real time using the artist layer that occupies the screen (stage 3).

4.4.7 TILO: an intervention

The opportunity arose to develop an artistic intervention that placed messages on the screen that would imply the screen had intelligence; that is, the researchers created an illusion that the building was awake and sensing its environment, reflecting people's predicted behaviour based upon the first stage observational, ethnographic analysis. The intervention was designed and incorporated within a FACT exhibition programme that had a science fiction theme. The design of the intervention, referred to as 'the awakening' during the exhibition, introduced the screen interface as the building's communication channel and would allow the building to speak via a text-based interface on-screen. The term 'Wizard of Oz-ing' (Kelley 1984) was used to describe how an audience could be deceived into believing that the screen was more sophisticated than technologically possible. The implication was that the awakened screen sensor-mapped the environment, and visitor behaviour was to be implied through a sophisticated layering of content via an online content management system devised specifically for the exhibition.

Using the opportunity of the exhibition, *Science Fiction: New Death*, to explore the future concepts and possibilities of screen intelligence and to challenge the audience, the 'awakening team' consisting of myself, one other researcher, and staff from the Creative Exchange worked with the developers of the TILO system and designed messages based upon observations from earlier research. Contextual messages were supplied to the screen as a combination of timed, pre-configured and live messages. Live messages could be directed in real time to the screen within the venue space. Timed messages were devised based upon previous ethnographic

studies of the physical space to determine the pattern and movements of visitors to the venue. This information was used to prime the messages for specific days and times.

The testing of the system was conducted during the private view of the exhibition and relied on a series of actors within radii of 20 feet of the screen, using Apple iPads connected to a web-based interface to post messages based on personal observations. It became crucial for the actors to be within sight of the screen, to observe the message in-context and to gauge the visitor response to it. While the exhibition was designed to 'Explore how our relationship with technology has blurred the lines between the real and the virtual; making our everyday lives feel increasingly like science fiction' (FACT, 2014), TILO borrowed concepts of machine intelligence from a series of science fiction narratives (e.g. HAL, 2001; Vicki, i-robot).

4.4.8 Interview/Questionnaire

I conducted a series of interviews with visitors using a questionnaire and open-ended questions to ascertain the level of interaction with the screen, and to identify concerns with the information presented within the screen. Each interview was intended to establish the tipping points where shared and hidden personal data becomes a concern. A tipping point was identified as a series of small changes that when amplified created a personal reaction to the issue of data sharing. In order to establish how much data visitors were willing to share, changes were made to the types of data individuals were willing to divulge until fears of losing control of personal information caused either a complete withdrawal from the service, or a change in behaviour. An example of this initially suggested that the TILO system

could access what films the individual liked, which was then escalated to suggest TILO could identify the journey the person made to reach FACT (using GPS technology), to finally having full access to a visitor's phone records and extending access beyond the individual by identifying friends, family, and colleagues.

I designed the following combination of questions to address the awareness of data sharing across a range of physical spaces, and online services:

- Are you comfortable with screens and cameras gathering information about you?
- If screens at FACT were able to obtain personal information to give a better service, would the visitor engage with it?
- Do you use social media?
- Do you have a supermarket loyalty card?

In the process of addressing the issue of cameras and screens gathering personal information, I suggested a series of hypothetical scenarios that allowed the participant to engage and explore their fears and experiences. The hypothetical argument explored the notion of sharing personal information through a combination of screen, CCTV, camera, social media and loyalty card technologies. In the process of explaining the questions, the implication of cameras and screens within public spaces drew on public perceptions and understanding of technology as well as personal data sharing practices.

4.4.9 Key findings

The findings suggest that visitors:

- Perceived cameras in public spaces created a positive and safe environment
- Were unaware of what constituted personal data
- Modified behaviour online to restrict access in social networks
- Considered FACT to be a safe, trustworthy environment in which to share personal information

While visitors acknowledged cameras and screens were visible in public places, they had different understandings of the purpose of a camera's presence. Visitor responses suggested an acceptance of cameras in public spaces, either for safety purposes or due to a lack of awareness. Visitors gave the following rationale for the justification and acceptance of cameras in public spaces:

- 'I don't really have anything to hide so I don't really mind' (TILO #3)
- 'I think we are unaware of it happening' (TILO #2)
- 'I don't mind because you feel safe' (TILO #21)
- 'It's that kind of out of sight out of mind thing' (TILO #25)
- 'It's more about your protection and your safety' (TILO #25)
- 'It's good for safety but it also encourages paranoia' (TILO #28)

The study revealed the majority of interviewed visitors were not comfortable with surveillance in public spaces, but accepted the presence of CCTV. Visitors suggested various reasons for accepting surveillance cameras:

- ‘At the beginning no, but now we are used to it. They see me, I don’t see them.’ (TILO #18)
- ‘I’m comfortable in the sense that’s the world we live in’. (TILO #7)

In addition, individuals described their perception of how surveillance cameras and screens worked. When questioned, the visitor to FACT was not aware of the limitations or the advances in camera surveillance technologies.

- ‘I think it picks up what it needs to pick up on camera’ (TILO #2)
- ‘I wouldn’t think it records everything that you say without you knowing? I would say I’m happy to a limited degree because it’s just visual’ (TILO #14)
- ‘I don’t mind them having my image. I don’t mind so much being on camera. You wouldn’t want them recording the conversation we just had in the café.’ (TILO #14)

The language of the public implies an otherness when referring to the surveillance camera: while one party suggests that the camera is autonomous (the reference to ‘it’ suggests it has independence from its location while the other camp suggests ‘them’ to infer a higher authority is watching). The use of cameras in public spaces was considered to be part of life and for security, which implied the visitor felt safer within a specific environment where cameras were present. Despite this finding, there were contradictions: although visitors felt safer with cameras in public areas, they did not like the *sight* of cameras because they felt cameras were an intrusion into their personal space.

Before the screen installation, 32% (n=28) of visitors said they were 'mostly' or 'completely' comfortable with cameras and screens gathering information about them. After the screen installation this figure rose to 75% (n=31).

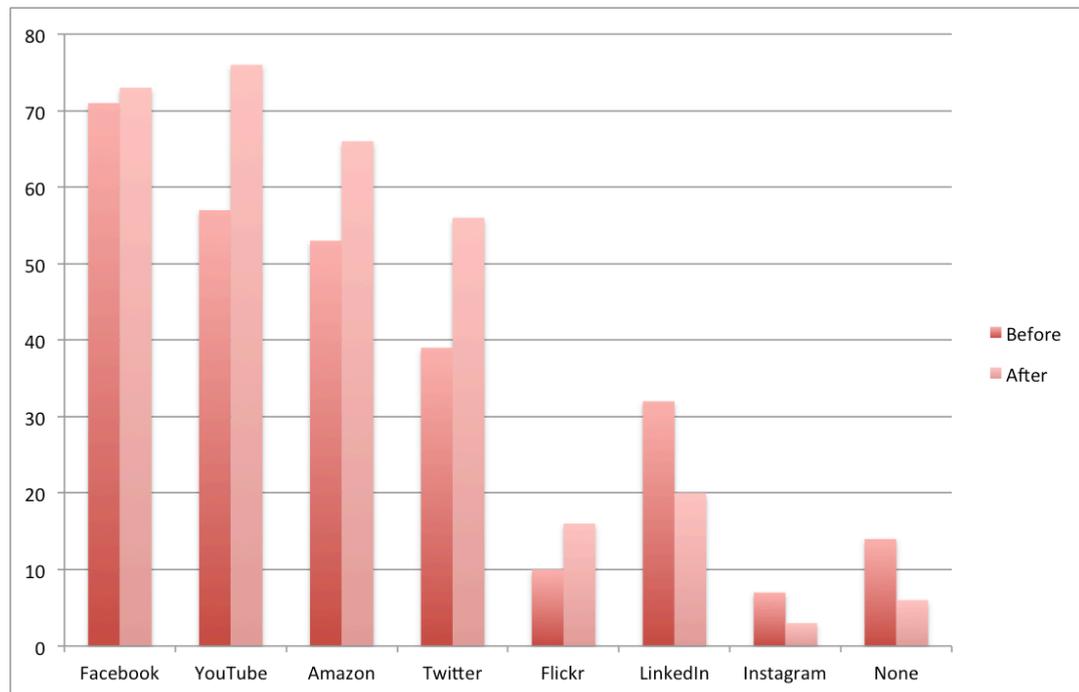


Figure 25. Audience sharing practices through SNS

Figure 25 above illustrates that visitors were familiar with sharing personal content online. Before the screens were installed, the comfort levels with screens gathering information was lower than after the screens were in place (Figure 26). The initial absence of screens suggests a warier audience, whereas when the screens were installed, there were greater levels of acceptance. This finding implies that when something is unknown it creates a greater unease whereas when the thing is visible it is less threatening.

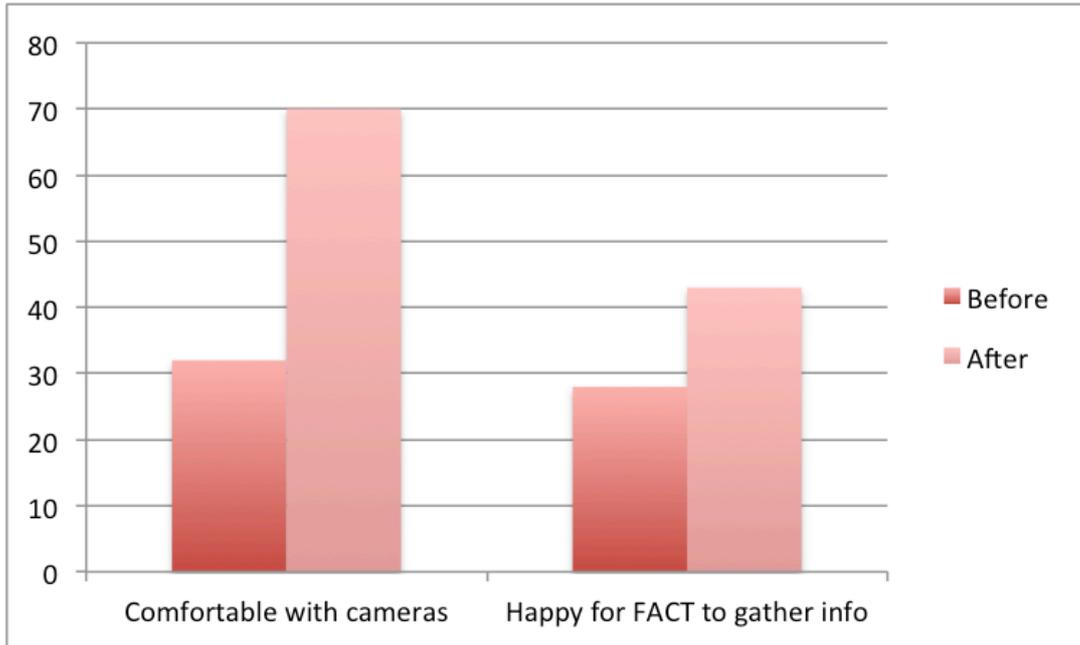


Figure 26. Comfort levels, before and after screen installation.

I also questioned visitors whether they used social media or had a supermarket loyalty card. The purpose of these final questions indicates a holistic approach to data sharing. While cameras are accepted in public places, visitors were interviewed to determine whether they considered that actions performed online had implications in the physical world. Table 8. Social media accounts by visitor demonstrates the number of social media accounts recorded.

Table 8. Social media accounts by visitor

Social media	Number of accounts	Percentage
Facebook	42	71%
YouTube	39	66%
Amazon	35	59%
LinkedIn	15	25%
Flickr	8	13%
Instagram	3	5%
None	6	10%

Table 9. No Social media / No loyalty card accounts by visitor

Social media/loyalty card	Number of accounts	Percentage
No social media	6	10%
No social media/Loyalty card	3	5%

Eighty-nine percent of visitors owned a social media account and 95% had both a social media account and supermarket loyalty card, with only 10% having no social media account. Five percent had neither a social media account nor a supermarket loyalty card (See table 9).

Visitors who did not have a social media account cited a similar reason to not being comfortable with cameras in public places: social media was ‘too public and I like to be private. I like to be more anonymous and I feel it is intrusive’. Those who were comfortable accepted that social media was gathering information about them, but were happy to manage the levels of content that was published. The rationale for managing the content was that social media was perceived to be a useful tool for communication with friends and family.

Visitors often made conscious decisions about what content they would share, stating that if they withhold certain information, the social networks cannot use it: ‘There is no real advantage for me to give them that [personal] information, and that means they can’t then do anything with it because they don’t have it.’ (TILO #7) The rationale for restricting the amount of information was that, ‘there are some things that I don’t care whether everybody knows and there are some things that I do’ (#7).

Withdrawing or manipulating personal information was used when the reciprocal

trade in personal data was not perceived to be equal. By passing false information such as the wrong address, data of birth etc., or restricting data to a minimum, the participant continued to access online services when the trade in data was not perceived to be an equivalent trade. Others used control mechanisms that did not relate to the reality of how the technology worked and would not restrict information being shared despite the individual's scrutiny over security settings. An example of this is the use of posting photographs online:

- 'I don't share a lot online, its more just photos and things...' (TILO #28)
- 'Facebook is personal. I keep reviewing my privacy. I've tried having it so only friends can see. I use it to share articles that I think are interesting, but I do put photos on there.' (TILO #9)
- 'Facebook are there watching anyway aren't they? Are you aware that Facebook is gathering information about you? I've got Facebook, but I rarely use it, though I've got Instagram.' (TILO #24)

The first and second examples highlight that photographs were not considered to be as important as text-based data, and that reviewing who has access limits that permission to within a circle of friends. This highlights, however, that while a user can restrict access to their account to a specific group of individuals, each individual may not have restricted their account in the same way. The consequence is that information can be shared across a range of individuals and that, outside of that group, security may be more relaxed from the original environment.

Early research findings before the screen was installed identified that visitors were curious about the venue's intentions and would be interested in engaging with the

screen if it were more intelligent. The implication that the screen could identify individuals was inferred during interviews with visitors. Many were intrigued at how FACT, as a venue, would represent this technology; while others were wary about the content being used for commercial gain. Interviews were conducted with 59 visitors before and after screens were installed. I transcribed and analysed the interview data that provided further information on the visitor's willingness to engage with their personal data.

Visitors were asked a theoretical question, 'If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?' I provided two options in the definition of what constituted personal information; option one suggested that the screen could identify the visitor by gender and age in order to supply more targeted information and preferences, whereas option two implied the screens could access the visitor's social network and GPS data. The latter would provide locative patterns, while accessing visitors' friends and family information from a mobile phone or tablet computer. In response to the first option, 55% of visitors were happy to engage and did not consider gender and age as a barrier to engaging with the screen and venue, 12% of regular visitors were inquisitive to the venue's intentions as they expected FACT to commission challenging artworks and would be interested in engaging with the screen if it were more intelligent. In addition, the second option that implied obtaining personal social network information was not accepted with the same interest: of the 55% of visitors who said yes to option one, 37% said yes to option two and were happy for their personal data to be used, while 10% were undecided.

The two choices (option one and option two) created a tipping point in which visitors were happy or unhappy to engage further. As the study has demonstrated, as the breadth of the data was hypothetically obtained, and privacy was perceived to be breached, the less likely visitors were to engage despite indicating trust in the organisation.

4.4.10 Findings during the exhibition New Death

The private view of the exhibition demonstrated that while visitors were targeted directly by context-aware messages, such as 'I like your scarf, if you are cold I could adjust the heating', visitors paid very little attention to reading them, despite standing within 3 feet of the screen. This was potentially due to the other marketing-related messages that would occupy the screen between the awakening messages cutting in and interrupting the standard screen environment. Those visitors who did observe and react to the messages directed at them did not see the actors within the vicinity. It could be implied that while both the actor and visitor occupied the same physical space, the ubiquity of the mobile technology used in public spaces rendered the actors invisible to observation or confrontation.

The visitor response to the venue differed to the response of the management team who were involved with the researchers in coordinating both the research study and artistic intervention. The venue management had strong beliefs in how the venue should be represented, which were more conservative than visitors' expectations. The decisions by the organisation to coordinate how the intervention would be conducted could be seen to be driven by economic processes that govern the

venue's enterprises (i.e., the venue is reliant on both arts and local government funding as well as commercial leasing of the café and cinema complex. The overall consensus demonstrated that visitors trusted FACT as a brand and expected the organisation to challenge the concepts of privacy and identity in a safe and artistic environment.

4.4.11 Analysis

The TILO project used interventional methods to investigate fear of data sharing within the physical space of FACT in Liverpool in which it was implied visitors were being observed and recorded by public information screens. Through a series of questionnaires and interviews visitors were asked to determine what, if any, personal information they were willing to share with FACT.

4.4.12 Cameras and screens create a safe environment

Questions relating to surveillance methods, such as 'Are you comfortable with cameras and screens gathering information about you?' and 'If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?' was used as a catalyst to gauge visitor reaction to screens in public space. Visitors responded with an awareness that cameras and screens were visible in public places, the overall consensus from those who participated suggested an acceptance of cameras, either for safety purposes or due to a lack of awareness. For those who accepted CCTV, the response was one of compliance; 'I don't really have anything to hide so I don't really mind' (TILO visitor #3); and 'it's good for safety' (TILO visitor #19). The use of cameras in public spaces was

considered to be part of life and for security, which implied the visitor felt safer within a specific environment where cameras were present. Other responses included, 'At the beginning no, but now we are used to it. They see me, I don't see them.' (TILO visitor #18), 'it's that kind of out-of-sight, out-of-mind thing' (TILO visitor #25), and 'I'm comfortable in the sense that's the world we live in' (TILO visitor #7).

Visitors suggested that a camera 'picks up what it needs to pick up on camera' (TILO visitor #2), implying that there was an intelligence behind the camera that was able to make judgements about the identity of the person being filmed. From the interview data, it was evident that the public were often unaware or confused by the technological possibilities as well as the limitations within screen and camera technologies. The initial questions relating to surveillance during TILO revealed a range of responses based upon personal anxieties and fallacies mixed with a few truths. Whilst interviewing visitors about surveillance, the following terms, *1984*, *Orwell*, and *Big Brother* were used in response to the question "Do you think the space is aware of your presence?". This was supported by stories of modern surveillance on the streets of Liverpool in which a number of people interviewed stated there were rumours that the new shopping district Liverpool One had enabled audio recording within the CCTV street cameras. Investigating the legitimacy of this story led to a freedom of information request on Liverpool City Council's website that repudiated the claims there was any audio recording taking place within the city as part of its surveillance measures. The narrative of surveillance supported the fears and anxieties linked to issues of control through surveillance systems across the city of Liverpool.

The questions relating to surveillance were used to imply that additional information could be obtained using a combination of facial recognition and later by accessing mobile phone records. The question 'Are you comfortable with cameras and screens gathering information about you?' was intended to investigate public anxieties in what could be construed as bordering on invasive and illegal. TILO pretended that the technology within the screen could obtain personal information about where an individual had travelled from, suggesting that it could access the individuals journey, which was considered to be too invasive and participants withdrew at that point. This supports the Skatova (2013) results and suggests that individuals consider personal geo-spatial information as highly valued as bank information. The Skatova (2013) results suggest that individuals were willing to pay the maximum amount of £30 to protect bank information whereas protecting social media content resulted in a medium value of £20, and only £10 for loyalty card data. This compares with the data from TILO that suggests that participants show little concern for sharing information in social networks, whereas location data was as invasive as prying into an individual's bank account. While this indicates that there is a growing awareness of data sharing and the nuances that result from hidden data, participants were willing to share information in return for personal dividends. This also supports the findings from the study on trust through interpersonal online relationships by Wiese et al (2011); 'People share things with people they feel close to or desire to feel closer to, as a way of strengthening this relationship' (Wiese et al. 2011, p.198). The study identifies that if there was a model for sharing this form of ubiquitous data it would help to define a more granular relationship between individuals that would support greater sharing practices. The current situation within Social Network Sites

(SNS) has been criticised in that it creates a platform for context collapse to manifest (Marwick & Boyd 2011).

In addressing the complexity and ubiquity of data sharing in public places, TILO identified that screens at FACT were perceived to be a form of entertainment rather than related to public surveillance. In one instance, the screen relayed a time-delayed video that reflected what was in front of the screen. The screen presented a sequence of video clips backwards and forwards as visitors passed by. Visitors who were entertained by the screen proceeded to engage with their self-image within the space. The following conversation demonstrates the tension between the screen as a form of entertainment and the ability to record and interpret what manifests in the physical space.

We played with the screen last time.

You played with it?

We were having coffee and I got up to play and interact with the screen

And that was fun?

Yes.

And is that information (interrupted)?

That was not information, it was art or playing with space and time.

(TILO visitor #10)

Each interview was designed to provoke a reaction to ascertain whether the visitor understood the technical possibilities of surveillance devices and, as the conversation above reveals, visitors to FACT considered the screens not to be complicit as a form of surveillance. When it was suggested screens were capable of making judgments based upon gender and age, it was perceived to be acceptable

but was considered to be too invasive when the boundaries between the physical and digital space was breached:

I wouldn't think it records everything that you say without you knowing? I would say I'm happy to a limited degree because it's just visual. (TILO visitor #12)

This quote suggests that visitors accept their image being seen, just as they are not concerned about sharing photographs; however, implying that surveillance cameras had the ability to record more information than just facial information about people in public, such as personal information and conversations, was perceived to be more troubling. When questioned, the visitor to FACT was not aware of the limitations or the advances in camera surveillance technologies. At the same time, the UK government recommendations and legislation is struggling to keep up-to-date with the latest camera technology, such as facial recognition and audio recording.

The current UK legislation states that, within the context of surveillance, audio and facial recognition should be used only in 'proportionate context' (UK Home Office 2013, p.13). Under the Surveillance Camera Code of Practice (Home Office, June 2013), guidelines suggest 'audio recording in a public place is likely to require a strong justification of necessity to establish its proportionality. There is a strong presumption that a surveillance camera system must not be used to record conversations as this is highly intrusive' (UK Home Office 2013, p.13). However, it was not evident from interviewing visitors that they had any awareness of the

legality of what was permissible when asked 'If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?'. The legal framework implies 'strong justification', but does not imply that it is illegal to record audio in public for surveillance purposes.

4.4.13 Restricting and modifying behaviour as a method of withholding information in SNS

Visitors were asked, 'Do you use social media?' which was intended to address the concept of surveillance through SNS during TILO, This was designed to allow visitors to indicate how they controlled their own personal information and whether they considered sharing it. TILO visitors suggested that they modify their behaviour online to manage a personal visibility when sharing personal information. Visitors often made conscious decisions about what content they would share, stating that if they withhold certain information, the social networks cannot use it: 'There is no real advantage for me to give them that [personal] information, and that means they can't then do anything with it because they don't have it', said one visitor.

Whilst the majority of users in TILO identified that they were comfortable sharing photographs online, Besmer (2010) finds that image tagging highlights social tensions caused by the use of identification. However, for some people the concept that they may appear in a photograph within an SNS and not be identified using tagging preferences was considered to be more problematic, as they would not know where the final image resided (Besmer & Richter Lipford 2010).

As visitors to TILO indicated, they restricted what was visible in return for access to online services. The examples provided below highlight that photographs were not seen as valuable as restricting other forms of personal content.

I don't share a lot online, it's more just photos and things. (TILO visitor #28)

And

Facebook, is personal. I keep reviewing my privacy. I've tried having it so only friends can see. I use it to share articles that I think are interesting, but I do put photos on there. (TILO visitor #9)

These comments suggest that while participants were confident that they had control over their personal information, photographs were not considered to require regulating. Digital photographs, like its analogue predecessor, were not believed to be a form of data and therefore outside of an individual's consideration when questioned. What was identified was that the link between sharing photographs and social networks is potentially too abstract to suggest a threat to personal privacy, whereas data sharing of a physical location, a phone number, or address is perceived to have greater significance. However, in contrast to this fixed form of data, a constant, fresh supply of photographs that identify location, and the relationship between people within an image, reveal a more granular level of detail than most individuals are aware of.

The findings suggest that visitors made conscious decisions about what they shared within social networks. The question 'If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with

it?’ identified how visitors perceived FACT as an organisation, and to what level visitors would entrust personal information with the organisation.

4.4.14 Reciprocity

TILO demonstrated how reciprocal trade has the ability to affect decision-making between personal data sharing practices in physical spaces. The series of scenarios which were presented to individuals during the TILO study helped identify the tipping point at which individuals demonstrated emotions, which ranged between comfort and anxiety. By pushing the boundaries between the technological and legal possibilities, visitors to FACT were invited to imagine that the building was able to access their mobile devices, to be able to ascertain their location, in order to provide a more personalised service. The result was that visitors responded positively to exchanging personal information with a trusted organisation. Visitors, in exchange, perceived FACT to act responsibly with personal data. A third of all visitors trusted FACT as a brand and expected the organisation to challenge their preconceptions of the arts.

[if it was] FACT, not like other companies like Google that sell information to other people. If it was just FACT I wouldn’t mind. Because it’s not like a big company. It’s about arts. (TILO #16)

The respondent indicated a perceived understanding of the process of how other companies, such as Google, commoditise personal data, but presumed that FACT would not engage in selling personal data because they understand the business

model exists to support the arts. This statement reflected a common theme within the TILO study that, once a level of awareness and trust had been established, regular visitors to FACT expected the organisation to challenge the concept of privacy and identity in the artworks that were exhibited and were disappointed when the exhibited works did not create a personal, emotional response. The arts organisation had an established reputation for challenging visitors' understanding of technology with regular exhibitions that were both educational and confrontational, and it was perceived by visitors that, as an arts institute, it would act responsibly with the data it obtained. The environment and ethos of the organisation influenced levels of trust and interactivity.

4.4.15 Visitors trusted FACT and its environment

The design of the environment at FACT had a significant effect on personal perceptions of trust. One consideration was that the building spans an area between two city streets and mimics a covered arcade space that has few boundaries between the public space of the street and the private space of a mall. This creates an arena that is configurable to allow greater interaction and functionality. In a series of encounters, the public seating was observed being manipulated by an individual in order to maximise its function. The moveable, interlocking, nested benches became a chair and table in which the user adapts the space into a temporary workspace. Later the space was re-used with the same configuration to accommodate a group of friends awaiting access to the cinema. These two incidents initially appear unrelated but after accessing the time-lapse footage (see Figure 24. Time-lapse photography taken at FACT, Liverpool documenting user access and

movement) it became clear that the act of the first user not returning the benches to their original configuration creates a chain reaction to the second set of users. While this act is not significant in its own right, it demonstrated one of the reasons why visitors felt comfortable at FACT. The environment of FACT allowed individuals the illusion of freedom in an unbounded environment that allowed individuals control and ownership over the space.

When collectively assessed, the relationship between the café environment and the physical space around the gallery became more apparent. The observations of the space and photographs taken within the café (Figure 23 Snapshots of user activity at 28 tables, FACT café, Liverpool.) illustrate that the majority of users utilised the space by interacting both physically (having coffee or lunch) and virtually (making use of the free Wi-Fi) at the same time. Laptops, mobile phones, tablets, and audio recorders were all documented within the café space. This was a far cry from the traditional image of an English tea-room; however, the scene does reflect a contemporary space which mirrors the original use of the early seventeenth century European coffee houses as an establishment of English liberty (PRÉVOST 1930). For many, the space was used as a collaborative environment in which the café became a virtual office or meeting space. It was also seen as a trusted space, in which repeat visitors perceived the environment with the same familiarity as the family home. The language used to describe the space was not described with the same negative connotations as Chattr, as the following visitor illustrates in the following comment:

The coffee was good, but I like the light of the space, the windows. The flowers around, sort of like being in a garden that I like. (TILO visitor #9)

FACT created an environment that visitors would be happy to engage with, and this was reflected within the (relatively) public space that regular visitors embraced as trustworthy. The TILO study suggested screens and cameras were capable of making judgments based upon gender and age, which was perceived to be acceptable but was considered to be too invasive when the boundaries between the physical and digital space were breached. This implies that while visitors deny giving access within a physical environment, they are consensually or unknowingly sharing personal information in a digital environment. Visitors did consider consenting to allow FACT to access some personal information for the benefit of offering a better service but withheld information that linked them to a specific location or connected them to friends and family.

4.4.16 Conclusion

Between the observational findings of visitors to FACT and the interview data, there is a commonality that creates a link between the physical and the digital environment. The perception of data sharing is linked to the comfort and familiarity of the space, whether physical or digital, as a determining factor in how data is readily shared.

The interviews identified distinctions between the reality of surveillance through the use of public CCTV systems and both a preconceived understanding and a reluctance to engage for opposing reasons. There was a strict polarity of views between visitors

who accepted or rejected that the camera and screens were gathering information about them. This was compounded by the distinct misinformation that surrounds the purpose of what constitutes data and how it is shared. In addition, interviewees suggested that it was the anonymity of being online that creates a sense of security, whereas other visitors suggested they were more threatened by technological advances in a physical public space and were less likely to engage than they were in their own private environment. The following visitor described this on the subject of being online:

Well, usually you are in your own home or in your own space, so you feel a bit more safe, don't you? (TILO #6)

The implications for personal perceptions of trust and a willingness to engage with other parties through digital public spaces were also evident in both Chattr and the Physical Playlist project. In this instance the reluctance to engage in the physical environment has implications for the development of the digital public space. If the public treats connectivity in the same way they react to CCTV, the consequence will affect what personal information individuals are willing to share.

This study raised further questions about how personal data is perceived, just as Physical Playlist identified the proximity to data changed personal perception of trust, TILO highlighted that there was still a misunderstanding of what constitutes personal data. Further research into the relationship between data types and how it is shared may be required. For example, the association between sharing photographs online and how trust between parties is established is an area that would benefit from further research.

4.4.17 Summary

TILO utilised the interactive screens at FACT in Liverpool to research visitors' willingness to exchange personal data as part of the interactive experience. The research used Wizard of Oz methods to explore visitors' understanding of data sharing. The outcome revealed how the relationship between visitors, their environment, and the reciprocal trade in personal information was made when individuals trusted the organisation they were interacting with.

The Nesta report, *Meyouandus: Interactive in-venue displays*, can be found at the following location:

http://artsdigitalrnd.org.uk/wp-content/uploads/2013/07/TILO_Report_FINAL-V3.pdf

5 Analysis

5.1 Introduction

This chapter presents the analysis of the aggregated and triangulated data from four case studies described within chapter 4. My research is the result of an area of enquiry relating to fears of sharing personal data. This investigation was achieved through a series of practice-based projects in which I used a mixed methods approach. Each project was devised in collaboration with colleagues at Lancaster University and with partners from external academic institutions as well as involvement from public and private organisations. The projects were devised to act as a catalyst in the investigation and this chapter is the final analysis to the combined outcomes of the four projects Chattr, Open Planning, Physical Playlist, and TILO.

The four projects demonstrate how the control of personal data amongst participants was perceived and managed. Each project raised important questions about personal online habits as well as fears that exist in relation to the subject of data sharing. The subject of fear grew from my earlier research on the negative association of data sharing (See 3.2 Practice-based Research and the Creative Exchange) and was developed further within the four projects.

Within each project I devised a range of questions designed to answer individual responses to why people did not wish to share personal information. This led me to use specific questions during each project that revealed a perceived fear of data

sharing. Often, personal fears emerged through the research as a consequence of a perceived understanding of what constituted personal information and how this information was obtained. An example of personal fear manifested in the relationship between individuals and surveillance methods described in both Chattr and TILO case studies. The subject of surveillance was introduced to initiate public discussion and to evaluate how the use of cameras, screens, and other ubiquitous technologies are understood in relation to sharing personal information. While these technologies are seen to be present within public spaces for security purposes, the ability for mobile applications to track personal movement within physical spaces has potential to raise concerns over personal privacy.

The analysis of these findings was specific to each project but when the data was aggregated and compared with the other case studies, they demonstrated traits that complemented or contradicted how individuals responded to the subject of data sharing. As my research progressed and the methods were revised, I began to experience a range of responses that were often contradictory to the previous outcomes. What this demonstrated was that individual responses were specific to the environment in which the research was conducted.

The following chapter describes the analysis methods used to bring together the themes that emerged from the case studies. Within the following section I describe how I implemented coding methods, visual tools, and mind-mapping as a method of thematic analysis.

5.2 Analysis methods

Within the methodology chapter I have identified the methods used across the four projects. I describe how the use of coding was implemented in identifying common themes that support the analysis. I also implemented mind-mapping to build up a profile of how fear manifested and to identify similarities within each project; this allowed me to isolate common themes. The theme cluster within Figure 27 below was the result of synthesising the findings from each project and visualising the emergent subject areas.

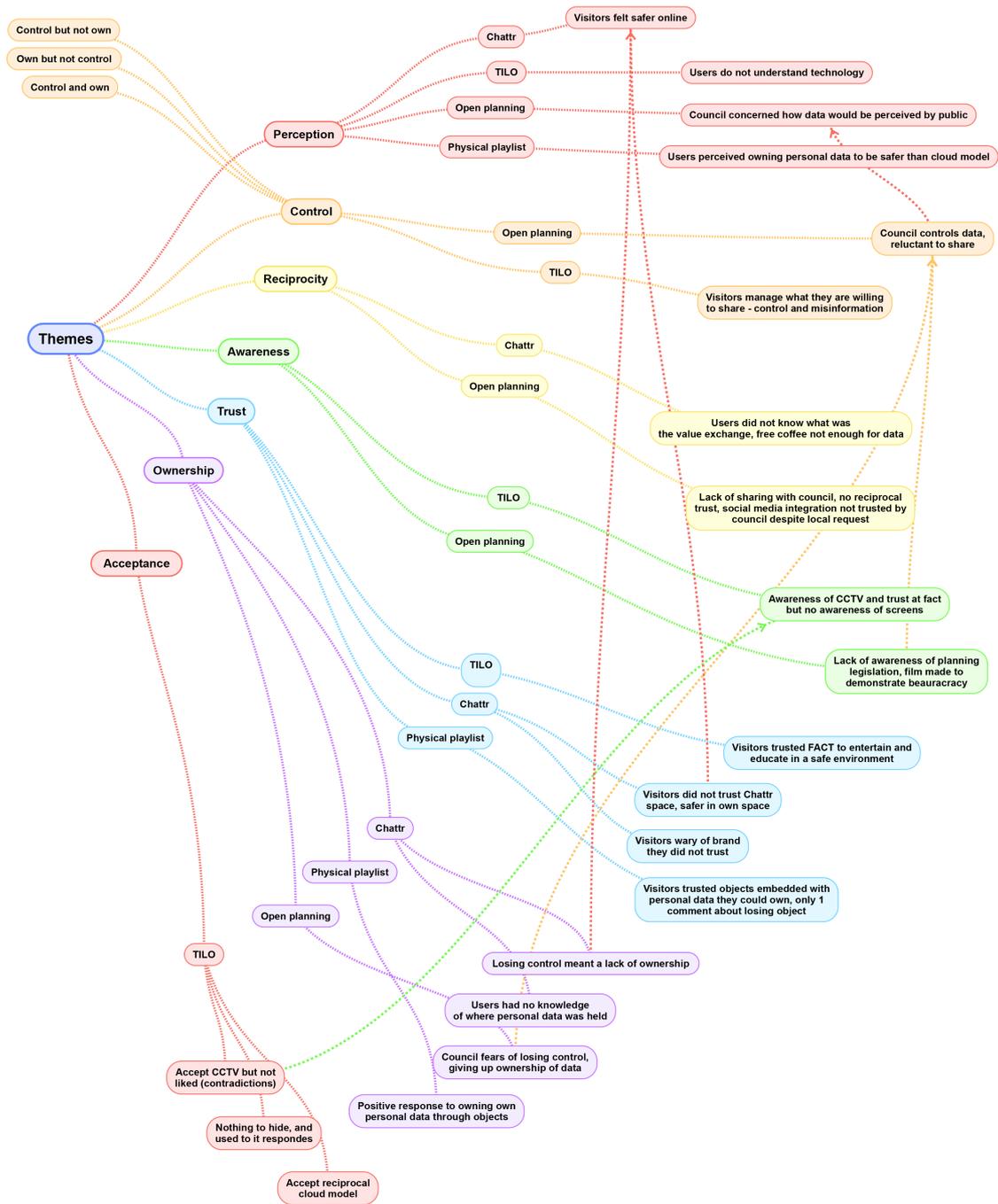


Figure 27. Original Theme Cluster

The information in Figure 27 was then further distilled (see Figure 28) to identify a final set of themes that I have defined within this chapter as contributing to the fear of data sharing. These are based upon a *perception of awareness and acceptance, Control (through ownership), reciprocity, and trust*. The act of scaling down from the

initial subset (Figure 27. Original Theme Cluster) of themes to the final set (Figure 28) was the result of combining less predominant and repeating subjects that emerged from each case and from within the literature. The analysis demonstrates how the data relates to my research questions, and reveals how the fear of personal data sharing practices are the combined result of emergent patterns of behaviour in both digital and physical spaces.

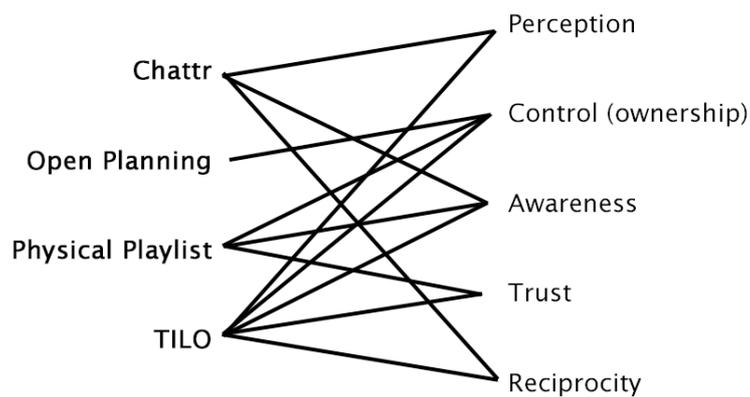


Figure 28. Selected themes, reducing and linking the themes from each case

What was encountered during the analysis of all four projects was a nuanced relationship that demonstrated how control is enacted between digital encounters that reflected participants' fear of sharing personal data. The findings reveal that control of personal information in digital spaces relies upon a series of interrelated factors: *awareness and acceptance, control (through ownership), reciprocity, and trust*. Figure 29, Relationship themes, illustrate how control is based upon the relationship between each term. The research identified subtleties between these complex arguments that have the potential to create a boundless situation in relation to the perceived ability to control personal data, in which it is possible to control but not own, and also to own but not control.

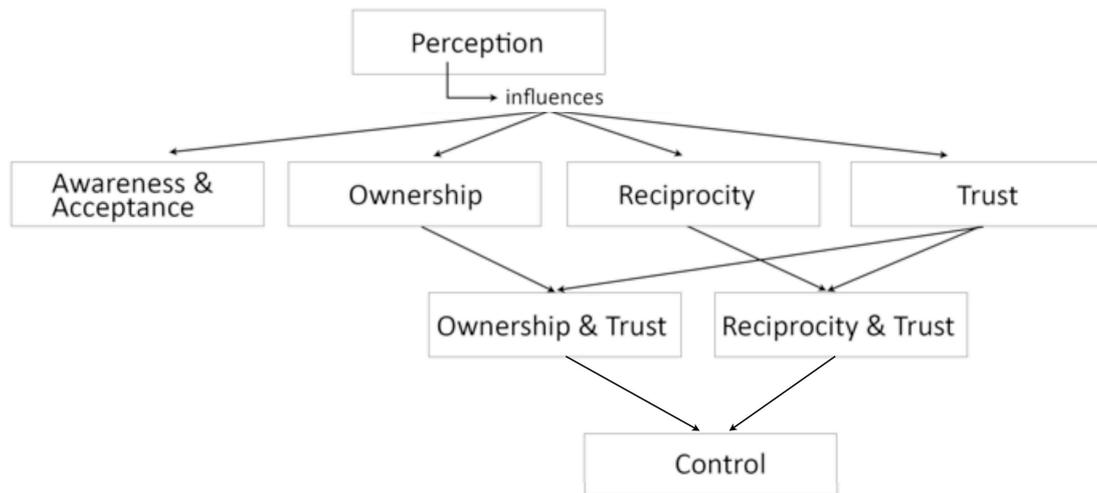


Figure 29. Relationship themes

Figure 29, illustrates how control of personal data is managed through a series of relationships. Control of personal information in online spaces often relates to the agreement made between the host and the recipient. For many users, the ability to control personal information is based upon an awareness and acceptance of how SNS utilise personal information (Hazari & Brown 2014; Wang et al. 2011; Thomas et al. 2010; Acquisti & Gross 2006). The relationship to control was based upon a balance between ownership and a reciprocal trade of personal information, which are based upon levels of trust. Trust, in this context, relates to Ben Shneiderman’s definition in which ‘trust facilitates cooperative behaviour’ as users are more likely to participate online if they receive assurances that they are interacting in a trusting relationship (Shneiderman 2000).

5.3 Identifying fears of data sharing

The challenges in the study, in determining the fear and anxiety of sharing personal data, have predominantly concentrated on personal information that relates to online consumer behaviour (Graeff & Harmon 2002; Milne & Boza 1999; Milne &

Culnan 2004) and the use of mobile applications (Fang 2017; Boss et al. 2015). While my research supports previous studies that indicate users do not pay attention to the terms of service (Milne & Culnan 2004), nor fully understand the relationship between services and personal data sharing, there were contradictions. The analysis of each project has revealed both complementary and contradictory relationships between projects that have highlighted how individuals perceive sharing personal information. The following diagram, Figure 30, reveals these relations between projects.

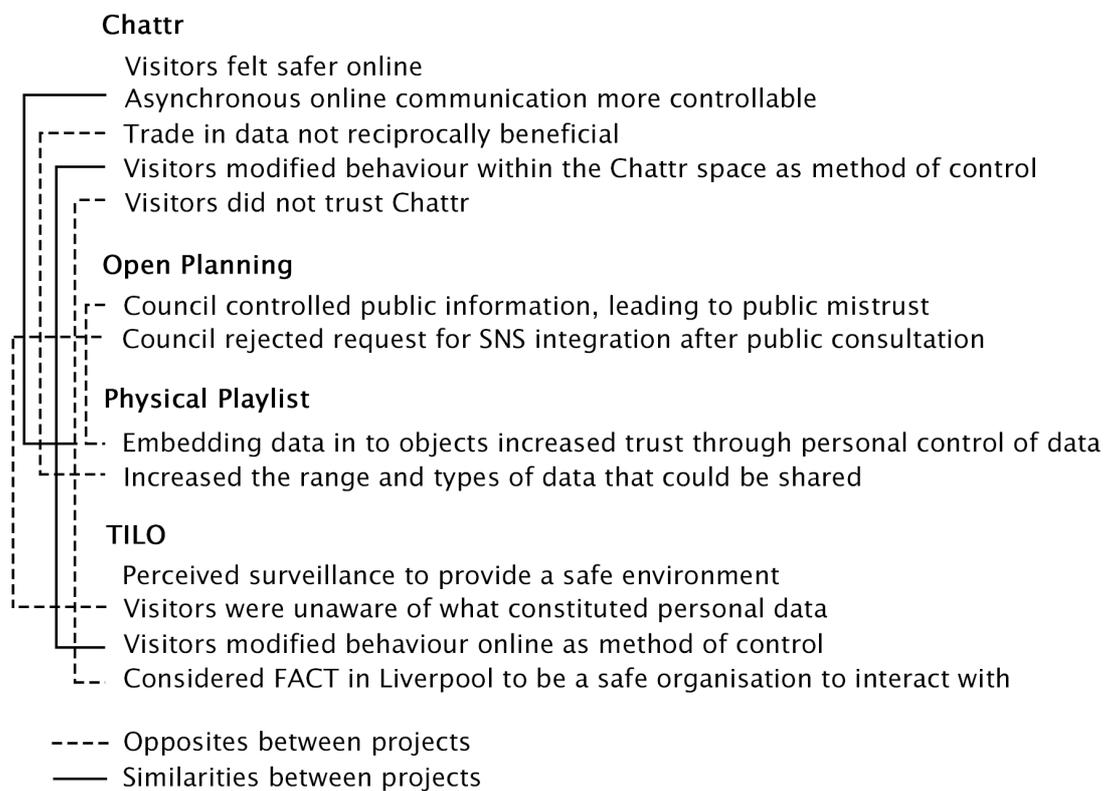


Figure 30 Opposing and similar relationship between projects

The dashed line between projects within Figure 30 shows the opposing response to data sharing whereas the solid line shows a similarity between research outcomes. For example, Chattr visitors did not trust the physical space and considered the

online environment more controllable, whereas the opposite was true in the case of Physical Playlist in which individuals took control of sharing personal data by embedding data in physical objects. What was evident from the findings from Chattr, TILO, Physical Playlist, and Open Planning was that the environment in which users interact online has a dramatic effect on how they perceive to be in control of personal data. What is clear in the literature is that, while there is an understanding that users engage with online services for personal rewards, there is a lack of knowledge of what constitutes personal data and how service providers make use of it. The study of regret in social networks by Wang (2011) addresses some of the issues of posting content to SNS while highlighting a range of events that have caused embarrassment to individuals. This identifies cases in which individuals have inadvertently posted photographs and video content without realising the implications of their actions. Events such as posting party photos that highlight alcohol and drug taking, as well as images of a sexual nature, have been mistakenly posted to online spaces in which the individual has been unaware until they later return to retrieve messages to the post. The following comment highlights responses to a video unintentionally posted online of a couple having sex, 'I didn't know I had posted it until the day after, when I logged on again, and saw all the comments from all of our friends and family' (Wang et al. 2011, p.5).

When trust breaks down the analysis has identified it is often due to a lack of ownership and poor reciprocal trade. This can be attributed to a tipping point in which incremental changes become significant enough to affect peoples behaviour and leads to a fear of sharing personal data.

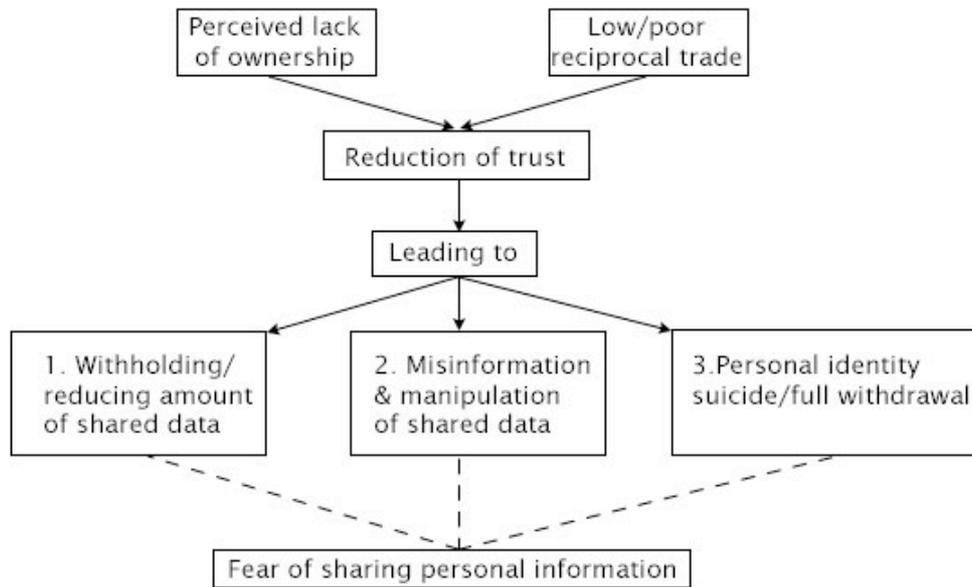


Figure 31 Reduction of trust leads to a tipping point

Figure 31, reveals that when there is a perceived lack of ownership or poor reciprocal trade one of three actions often arise: individuals withhold specific information – providing only the essential information required to participate online; they supply misinformation or manipulate the data – an example is providing a wrong address, telephone number, or data of birth; and finally, when trust has broken down, individuals withdraw completely, removing all content and cancel their account which ultimately leads to a tipping point in the relationship between the individual and a SNS. This leads to a fear of sharing personal information.

The following table identifies how tipping points manifested within the four case studies:

Project	Tipping point (when change occurred)	Individual behavioural traits
Chattr	<ul style="list-style-type: none"> • Reciprocal trade not equal before terms and conditions. • Identity of brand not trusted. 	<ul style="list-style-type: none"> • Withdrew before access agreed • Misinformation • Modified behaviour
Open Planning	<ul style="list-style-type: none"> • Public not trusted with public data by council. • Council withheld development in sharing data within mobile application. 	<ul style="list-style-type: none"> • Council withheld access • Public mistrust
Physical Playlist	<ul style="list-style-type: none"> • Public trusted trade when they had control of personal data. 	<ul style="list-style-type: none"> • Openly traded when they controlled access
TILO	<ul style="list-style-type: none"> • Visitors trusted FACT with limited information (gender, age) to provide personalised service. • Withdrawing when trade not reciprocal, such as sharing personal address. 	<ul style="list-style-type: none"> • Withheld information • Modified behaviour • Full withdrawal

An example of tipping points with similar behavioural traits was demonstrated in Chattr and TILO. Visitors to Chattr that did not wish to share personal information suggested that the trade in data was not reciprocally beneficial. Those that did enter Chattr, but did not wish to exchange personal information, did so by withholding and

manipulating personal data. The manipulation of data manifested through conversation, using false information while maintaining access to the free services provided. In TILO visitors suggested that, although they would share personal information such as their gender in return for personal recommendations, they were not content to share information if it became more personal, such as their address and would often withhold information while still maintaining access to online services.

Raising questions about surveillance, social network preferences, and shopping habits within each project space initiated a discourse that allowed the research to probe personal fears of data sharing, which has identified:

- Individuals accepted surveillance for safety purposes
- There were misconceptions about what constituted personal data
- Individuals perceived to be in control of personal data
- The ubiquitous nature of data sharing leads to a privacy paradox
- Fears of sharing personal data is based upon a reciprocal trade and trust

5.4 Surveillance for safety purposes

Surveillance in physical urban spaces is seen as one mechanism for social control. While cameras have been used for public surveillance for over 50 years, their use still provokes and divides public opinion. As Foucault has implied in his work on the Panopticon, people are watched but do not know when or by whom (Koskela 2003). Thus, surveillance is 'based on a system of permanent registration' (Foucault: 1977, 197). Foucault describes a state of 'social quarantine' (Foucault: 1977, 216) to

illustrate how power 'infiltrates' all existing social systems and defines a modern social order through which 'society is one not of spectacle but of surveillance' (Foucault: 1977, 217). However, Paul Virilio suggests that the emergence of a digital space has been instrumental in the loss of a relationship with a material world (Virilio: 2011, 72). Virilio suggests that fear has 'become an environment' (Virilio: 2012,46) in the sense that physical public spaces are surveilled by CCTV, while individuals are increasingly voluntarily contributing a range of personal data that can be traced and attributed to a named individual in the digital public space.

This means that whereas the surveillance described by Foucault was reliant on physical space, the modern definition of surveillance surpasses the static framework that is represented in the image of the physical and increasingly associated with the spectacle of a digital environment. The analysis of the case studies within this thesis reveals that the relationship between a physical and a digital space is entwined in multiple, online encounters. Foucault identifies the rise of covert surveillance methods within the context in which it was written, and establishes the relationship between an individual and a controlling power. While this denotes a world that is representative of the physical surveillance towers and cameras, Foucault could not have foreseen a modern social order observed from the omnipresence of a mobile, global, and networked infrastructure that is often conducted through a process of mutual agreement.

Beyond the scope of the surveillance camera and all that it represents, the aggregation and commodification of personal information is not a new practice

brought on by the digital revolution; data that describes where people live, how they travel, and what is consumed have been the staple of governments and private companies using personal data to determine individual habits and patterns of behaviour (Steeves 2002). While this information was previously the preserve of city planners, health authorities and transport departments, the rise of data trading by private organisations demonstrates that the process has become a reciprocal arrangement in which consumers increasingly trade personal information in exchange for personal reward (Albrecht 2002).

When members of the general public are asked what they think of video surveillance in public spaces, answers such as this are common: 'I'm not doing anything secret anyway. If people see me face-to-face or via a camera is all the same to me'. (Sætnan, Mork Lomell & Wiecek 2004, p. 397)

In the example of TILO and Chattr, participants responded similarly to the study by Sætnan et al. (2004) in which interviews with the public reinforced a similar behaviour of acceptance on the subject of control through surveillance. By interviewing participants about cameras in public spaces (Koskela 2003; Lyon 1994; Koskela 2000; Fuchs 2009) as well as their use of supermarket loyalty cards (Albrecht 2002) and social media habits (Thomas et al. 2010; Fogel & Nehmad 2009; O'Brien & Torres 2012), I was able to identify common traits that are reflected in the literature. TILO revealed that visitors were comfortable with cameras and screens gathering information about them as a method for protecting personal safety. The responses from those interviewed ranged from a position of acceptance; 'it's good for safety'

(TILO visitor #19) to a level that it has become invisible; 'it's that kind of out-of-sight, out-of-mind thing' (TILO visitor #25). Whereas, visitors that declined to enter Chattr revealed that they preferred to communicate online as a method of controlling personal privacy. The reference 'I don't want to share conversation, online is private. I set my settings to private, only personal friends can access' (Chattr visitor #18) suggests an awareness that individuals wished to protect personal data while demonstrating a perception of how to maintain control over personal privacy. Questions relating to surveillance in public spaces divided opinion and revealed a distinction between the perceptions of technology, how it was used, and the legal framework for the operation for surveillance purposes.

For many people, cameras in public spaces represent the mechanism of support for a secure and safe environment, whereas others see it as an infringement on personal liberties in which campaign groups such as Big Brother Watch (bigbrotherwatch.org.uk) actively campaign to protect privacy. 'For most people, it is possible to ignore surveillance in their daily lives; to take it "as part of the (street) furniture" (Groombridge, 2002: 30) (Koskela 2003, p. 306). However, modern mobile technology has surpassed the street camera's ability to identify individuals, and personal surveillance has migrated to more sophisticated, yet opaque, digital devices. Surveillance increasingly manifests through the things that we buy, when we buy them and how often (Graeff & Harmon 2002). Thus, the increasing ubiquity of mobile technologies and objects that offer connectivity has led to greater ambiguity surrounding how personal data is shared between commercial and public organisations.

5.5 Perceived control of personal data

The analysis of the case studies identified the perception of what constitutes personal data was mixed (see Table 10 Perceptions of data sharing). The public acknowledged that they shared personal information with friends, family and colleagues, and considered that they were in control of the amount of information that was shared. However, there was both a misunderstanding of personal data, and how best to protect it.

Table 10 Perceptions of data sharing

PROJECT	DATA	SHARED THROUGH	CONTROL MECHANISM
Chattr	Conversation	Social Networks	Privacy Settings
	Online transaction		Misinformation
Open Planning	Planning data	Planning portal	Privacy settings
	Photographs		Physical control via Council
Physical Playlist	Music	Physical object	Physical control
	Video		
	Health Personal information		
TILO	Conversation	Social Networks	Privacy settings
	Photographs		Misinformation
	Online transactions		

The following response from a visitor to TILO, when asked about the use of supermarket loyalty cards, reflected a level of acceptance of sharing personal data as this reaction testifies, 'I knew I was selling my data and they monitor what I buy, I try not to think about it too much' (TILO visitor #9). This exchange of data, based upon

personal shopping habits was acknowledged to reward loyalty, which was identified across the four case studies. However, when individuals identified they shared personal information through social networks, understanding what constituted personal data was less understood.

Open Planning, Chattr, and TILO revealed there was confusion when sharing personal data within online services. What the analysis has identified is, that while there is a perception that data sharing is a private practice, the majority of people utilise online services that require access to personal content for marketing purposes as a condition of the terms of use. TILO demonstrated that individuals were aware of protecting personal data, just as the Skatova (2013) study has previously demonstrated, but did not consider specific content as data. In the example of TILO, photographs were not recognised as personal data, nor that they require protecting. The following quote, 'I don't share a lot online, it's more just photos and things' (TILO visitor #28) demonstrates that while individuals were wary about sharing personal content online, photographs did not command the same value. Other responses suggested they maintained personal privacy through SNS privacy setting but did not identify photographs as personal data as this reference testifies, 'Facebook is personal. I keep reviewing my privacy. I've tried having it so only friends can see. I use it to share articles that I think are interesting, but I do put photos on there' (TILO #9). Just as the supermarket coupons identified the relationship between shopping and surveillance, the relationship between photographs and personal data was equally obscure. This is supported by the study from Miller and Edwards (2007) who identified that users of the photo-sharing site Flickr did not

consider privacy to impede the ability to share photographs. For many the ability to share photographs through online posts enabled others to comment and to engage in their community (Miller & Edwards 2007). Conversely, Open Planning revealed the exchange of photographs was met with levels of mistrust from the Council as an aid during planning consultations. The outcome of the study revealed that the Council distrusted the public to contribute and share planning information, which resulted in the lack of social media integration within the final design of the mobile application due to the fear of misinformation from the public. In particular, photographs were seen to bias opinion and therefore were not trusted.

Chattr revealed a level of mistrust in sharing personal conversations within the physical space despite revealing a level of trust in online environments. Visitors to Chattr were divided between those that entered the Chattr space and recognised that conversations would be broadcast, and those that refused to be recorded due to a level of mistrust. All those that were interviewed during Chattr had Social Media accounts and were, as a result, engaging in conversations online. Therefore they were also sharing personal data with third party organisations. However, the same group did not wish to engage in Chattr due to mistrust but did consider the online environment to be private as previously identified 'online is private' (Chattr visitor #18).

5.6 Protecting privacy and the privacy paradox

In the pursuit of protecting personal privacy, users attempt to manage access to personal information whilst maintaining an online presence. The desire to share

personal information, while also wishing to protect personal privacy, has created a 'privacy paradox' (Taddicken 2013; Taddei & Cotena 2013), in which there is often a tension between the aspiration to self-disclose and the requirements to protect privacy. (Taddicken 2013). As personal information is exchanged during online interactions, such as exchanging updates through SNS, or making a purchase online, there is reliance upon individuals to self-disclose information whilst selectively protecting personal information from becoming public.

The management of personal information is often performed through a range of practices of which the following actions were considered to be an effective barrier in the protection of personal information: restricting who was granted access, limiting the amount and the range of content available, and using misinformation (e.g. using a false name, age, and address). In TILO, the following quote, 'There is no real advantage for me to give them that [personal] information, and that means they can't then do anything with it because they don't have it', supports the study by Wang et al. (2011) in which similar strategies are used to restrict personal data and therefore protect personal privacy. The study by Wang et al. (2011) demonstrated Facebook users deleted and untagged information so that it could not be linked in order to circumvent the SNS privacy policies. Other methods included self-cleaning by editing content at a later date, delaying posting and ultimately just reading but not posting (Wang et al. 2011).

In Chattr, the use of misinformation was used to avoid being identified. This was achieved using false names, offensive language, and alternative languages as a method of gaining access without exchanging data that could be perceived as trustworthy. The Chattr case study supports the study by Son and Kim (2008), and Milne (1999), by highlighting the reluctance to share personal data, whereas the results from TILO and Physical Playlist indicated a more manipulative and complex relationship between the ownership of personal data and trust associated with current sharing practices. Participants within these projects made decisions based on their ability to identify the value of personal information that affected their personal privacy. As users become more aware that SNS are offering free, online services in exchange for personal information, there has been a growth in sites that offer services that pertain to giving control back to the user. The strapline, 'Regain control of your social world' is the message minds.com offers customers on its login page as a way of enticing customers away from the existing SNS. The results of the Chattr project demonstrated that visitors were reluctant to share information within the Chattr space as they did not trust or see the value in the exchange. While visitors recognised that SNS commoditised personal information and that they willingly used online services, they made personal judgments based upon the reciprocal trade.

5.7 Reciprocity and trust

Across all four projects, participants responded to the environment in which data was shared with a variety of approaches depending on levels of trust and the agreement under which personal information was traded. Both Chattr and TILO highlight that there was a reciprocal reason for sharing personal information and

that content held varying values. Personal information was seen as tradable in return for a service such as the ability to converse remotely with friends and family, for the benefit of access to street maps, or discount coupons that could be exchanged for reductions at the supermarket tills.

In conversation with visitors during the TILO project it was not always identifiable that those visitors were conscious of sharing personal information. Participants were aware they received recommendations in the post for shopping online, but it was not until the coupons arrived with reductions on the products they had previously purchased that they became aware that they were being monitored for the purchases made (Son & Kim, 2008). Some participants had indicated that they changed their shopping habits by making conscious decisions to purchase specific items without charging it to their store card, or paying in cash to stop specific items becoming attributed to a specific account. A number of individuals throughout the research indicated they provided false or limited information to the companies supplying the service. This supports previous research that reveals how users manipulate personal information that is collected through supermarket purchases, whereby individuals organised clubcard swap parties to anonymise users' shopping habits (Albrecht 2002).

Chattr and TILO addressed the level at which users withdraw from sharing information when they consider there is no longer a reciprocal return from the original investment, as one visitor during Chattr revealed:

'I don't know what the value exchange was. With Google Streetview, you do.
It's not just about the physical vs. online, it's about value.' (Chattr visitor #11)

Whereas visitors to FACT in Liverpool trusted the organisation not to sell personal data as this response suggests:

[if it was] FACT, not like other companies like Google that sell information to other people. If it was just FACT I wouldn't mind. Because it's not like a big company. It's about arts. (TILO #16)

What differentiated TILO from Chattr was that the space reflected a trusted environment in which to engage, whereas visitors to Chattr did not trust the brand or the environment. Visitors to FACT were more trusting in the organisation than visitors to Chattr and participants in Open Planning. This could be attributed to the organisation's established position and brand with its arts and technology pedigree, as well as the prestige of hosting international festivals, endorsed and funded by Liverpool City and the Arts Council. It is also a venue designed to exhibit and address the boundaries of contemporary arts and technology. By applying them in a safe space outside of the commercial enterprises that exploit personal information, visitors felt they were in a safe environment in which to explore these boundaries, while confident about the reciprocal agreements on entering the physical space.

Both TILO and Chattr represent digital content sharing within a physical space, while Physical Playlist represented digital content that transcended both these

environments by enclosing all that was considered digital and transient into a physical form that could be touched, worn and controlled by its owner. Indications that users had become wary of sharing personal information during Chattr were clearly evident during TILO and the Physical Playlist project. Just as TILO demonstrated that the environment has the ability to instil trust, by using a physical object as a method for sharing personal data the Physical Playlist bracelet was a mechanism for keeping digital content close to the individual and increased the perception of trust between the data and the participant.

What TILO, as well as the Physical Playlist analysis, reveals is that encounters between the digital and physical environment are creating new rules of engagement. Physical Playlist removed the requirement to engage in a reciprocal agreement between SNS and recipient by giving control of the data to the owner of the content. In the past, when we entered into conversation, a series of social interactions took place (Goffman 1956). During physical, face-to-face communication, personal interaction is based upon the perception of both parties, relying on verbal and physical symbols of communication. Telephone communication conceals the ability to gauge facial or physical signs. Therefore interaction can principally be assessed based on nuances of personal vocal inflections. Online communication relies on a series of choices, often made by human interactions but increasingly controlled instantaneously by the networked machine. Judgments are made using real-time information about the situation and location, which are established using predefined personal preferences and experiences. Goffman argues that the security of a physical encounter will vary based upon the amount of information already obtained.

Goffman advocates this is part of an information game, in which 'a potentially infinite cycle of concealment, discovery, false revelation, and rediscovery' (Goffman 1956, p.8) takes place.

5.8 Conclusion

What was identified through the analysis process is that personal information is seen to reside in online spaces such as social networks. However, the ability to engage online within a physical arena has created a hybrid space that bridges the space between the physical and digital environments. While the distribution of digital content is borderless, individuals make calculated transactional decisions that rely on personal assurances based upon their physical surroundings. This not only creates implications for controlling personal data; the analysis has identified that data sharing relies on and has implications for the environment in which data was shared. As efforts are enacted to control personal information through personal profiles and security settings within SNS, individuals are reportedly adjusting their behaviour offline to prevent compromising material being produced in the first place (Lampinen et al. 2011).

Studies have indicated that there is a growing mistrust in sharing personal data (Wang et al. 2011; Marwick & Boyd 2011), just as the media has represented corruption, theft and mismanagement of personal data. The study by Wisniewski (2012) demonstrates that while the sharing of personal data continues to rise, users are increasingly adjusting their behaviour in order to protect privacy. The analysis of the case studies described in chapter 4 demonstrates how people perceive personal

data, how they share digital content, and perceive to be in control when they post information online.

What was identified is that users recognise the value in protecting traditional data such as financial details and address information, but do not identify the value of protecting emergent data types such as geo-spatial, aggregated information, and visual data, such as photographs and video footage. As companies have identified that individuals are willing to exchange personal information in return for financial reward, the increase in social network and mobile applications that record and reward individuals has increased.

An example of this is the Aviva Drive™ application introduced by the UK car insurance company Aviva in 2015. The application records driving habits such as acceleration, braking and cornering (Aviva.co.uk/drive) in order to identify safe drivers. By travelling with the application installed on a personal mobile phone, each driver earns badges as they display safe driving skills, which can lead to rewards that are later linked to insurance discounts. The insurance company has applied gaming credentials to the application to survey its potential and existing customers by giving each user a score after 200 miles has been completed. Badges are rewarded based upon driving habits that use the geo-locative ability of the phone to identify where the individual is at any given time. This applies to the speed and direction of the vehicle, which results in the application's ability to make judgments about the drivers' aptitudes. Not only are rewards offered for safe driving but badges are

promoted as a way in which the driver can endorse their driving abilities with others via SNS such as Facebook and Twitter.

The rise in gamification of common tasks by online companies suggests that users show little awareness they are being utilised to perform functions that are either too low-tech or too time consuming for one company to support. Google launched the augmented reality game Ingress (ingress.com) in 2013, which relies upon individuals to race against one another across public spaces. The game adopted public landmarks and monuments within the gameplay, portraying them as portals and bases in a science fiction environment in which users navigate across the physical cityscape in return for rewards. While the game uses Google products during gameplay, it also tracks user movements between targeted installations within the game that would be difficult to trace with a Google street car camera due to the nature of the pedestrian environment in specific locations. By encouraging public participation, specific routes can be identified using groups of individuals who track between locations, identifying the fastest times between locations. By amassing the data from the games conducted across the world, city maps can be enhanced to provide walking routes that do not rely on conventional traffic information.

While the Aviva Drive App and Google Ingress applications suggest that users are not aware of the true value of the information that is shared, the analysis highlights that users adapt both physical and digital behaviour in order to control their online identity. As Lampinen (2011) has previously suggested, people perceive they have more control over their online presence than they do of their physical identity.

Chattr and TILO supported this view while demonstrating areas in which individuals were reluctant to engage in the physical space but were comfortable engaging online. Open Planning revealed mistrust between organisation and the public. Finally, Physical Playlist represented the emergent sphere that bridges the physical and digital environments, within which there is growing concern for the management and control of personal data. The ability to own digital content that has been embedded within a material object was perceived to offer the assurance of control that was non-existent within current social networks.

Media reports continue to demonstrate how personal information has the ability to be misunderstood and misused as data is shared. However, as this analysis chapter has demonstrated, the definition of what constitutes personal information is ambiguous. For many, personal data represents another form of surveillance that can be used as a form of social control. The analysis of personal data has created a paradox in which the public is content to access online services in exchange for personal benefits; however, when trust in the organisation providing the services is low, the public may still require access to online services and manipulate the digital space by circumnavigating personal information requests, replacing personal profile data with false information.

The Chattr project demonstrated that, in context with other social media terms of use, both participants and non-participants perceive to be in control of personal information. As the examples have shown, the actions of Chattr participants reveal how aggregated information can be corrupted and wildfires spread, as the original comment, *'We put a bomb in the London Tube'*, made in jest was made public and

re-tweeted. The Chattr study highlights the existing claims of Solove (2006) and Roosendaal (2011) who have raised concerns over personal data sharing. Both authors identified the online space as a location in which data sharing activities should have greater transparency. Roosendaal challenges the rights for 'contextual integrity' (Roosendaal 2011, p.9) of personal data, which suggests personal information should not be traded outside of the context in which the information was originally intended, and that the individual should be made aware and able to make informed decisions over data sharing practices. Solove puts forward the case against the 'nothing to hide' argument in which security is juxtaposed alongside the case for the rights to privacy (Solove). In his argument, Solove challenges the United States government use of data surveillance through the example of the 'Total Information Awareness' (TIA) programme led by the Bush administration after the 9/11 attacks in New York in which 'the vision for TIA was to gather a variety of information about people, including financial, educational, health, and other data' (Solove 2007, p.1). The creation of the Total Information Awareness Office in 2002, part of the US Department of Homeland Security, established a system for the collection and aggregation of consumer data in order to identify abnormalities in behavioural patterns in the population that would identify terrorist activity. This form of 'integrated surveillance' (Lyon, 2003 p.91) described the rise in monitoring information flows and digital encounters that linked consumer data and public surveillance. The same argument was put forward by the British Conservative Government in which William Hague, Secretary of State for Foreign and Commonwealth Affairs in 2013, suggested the same legitimacy for harvesting British citizen data for the purposes of security. In a BBC interview he stated 'If you are a

law abiding citizen of this country going about your business and personal life you have nothing to fear' (Andrew Marr Show, 9 June 2013). Solove argues that individuals have the right to privacy, which was also the sentiment of those that did not wish to participate in Chattr for fear of losing control of personal data.

Where the study of Chattr differs from the fears defined by Roosendaal and Solove is that Chattr demonstrated that participants felt safer sharing personal information through established social networks. Chattr highlighted concerns over privacy in the physical space, which highlighted issues for the aggregation of personal data in online spaces. However, stored memories and identities continue to be defined in the social networks as a shared, tradable experience that the user perceives to control, manage and share. The question is whether the shifting terms of data use and the identity of third parties are ever fully understood. What is evident is that further research into the socio-demographic relationship between data sharing practices is required (Hazari & Brown 2014).

6 Conclusion

6.1 Introduction

This thesis set out to explore why the public demonstrate a fear of sharing personal data, specifically how personal data contributes to, and has become, a cause of mistrust and fear. This concluding chapter draws upon the findings used in the investigation of the fears of personal data sharing practices and presents an argument that supports the theoretical and practical implications for further investigation. While each project can be read as a separate document as the findings from each study are summarised within each case, collectively the aggregation and analysis revealed a complex discourse of data sharing practices.

Based upon the original areas of enquiry, the findings from the four case studies sought to answer the following research questions:

1. What are the perceptions of personal hidden data?
2. What are the concerns of shared personal hidden data?
3. Where do the concerns of shared, personal hidden data come from?
4. What is the tipping point where shared, hidden personal data become a concern?
5. How does shared, personal data affect personal digital storytelling through collective and connective memory?
6. How has collective and connective digital memory affected the notion of storytelling?

6.2 Objective

The objective of the thesis was to investigate how personal data sharing is perceived and leads to personal mistrust and fear. The design of each project allowed the researcher to examine how personal data sharing is conducted that leads to perceived personal concerns. The challenges in approaching this subject using a series of diverse practice-led projects, allowed the researcher to explore fears of data sharing from a non-technological perspective. This allowed a more hands-on approach, working openly with the public, and gaining experience working with participants directly. Devising projects that had a physical element created opportunities to create and adapt new methods from existing methodologies. As the methodology chapter illustrated, a range of methods were adopted during each study, incorporating both qualitative and quantitative approaches.

The outcome of each investigation into individual fears of sharing personal data revealed a series of challenges in the design of the research throughout the thesis. The subject of personal data sharing and the reluctance to engage reveals a series of contradictions when attempting to document individual behaviour. This was often due to the nature and action of online communication, which is often a remote and solitary activity, challenging the methods used across the research.

6.3 Research design

A combination of design-based methods was used as it offered a level of flexibility and ability to challenge the status quo of existing personal data sharing practices. In addressing this problem, the research adopted a design-led approach. The thesis

reflects a non-traditional approach to the research. By exploring issues that affect digital space in a physical environment through a mixed methods approach, the research explored the physical and digital space outside of a purely digital framework.

Saikaly (2002) suggests that the design-led approach is in itself is a form of research, while Niedderer (2007) argues that design-led practice may require new methods to explore and define the ways in which knowledge is made available. The practice of designing interventions as a form of experiment was framed within a context of investigating how practice can enhance and improve the research outcomes. Practice, in this context, was designed as a method to inform knowledge and understanding of hidden digital processes. For example, the use of 'Wizard of Oz' techniques, originally established by the computer scientist, John F. Kelley (Kelley 1984) for the purpose of investigating linguistic and usability engineering in computer science, was adopted and elevated to a physical presence within TILO and Chattr. For many of the Creative Exchange research projects, the physical manifestation of the digital space was designed to be corporal and tactile. This not only made the digital environment physical, it also created a visible platform in which to explore the concept of digital public space.

The flexibility of the research design was central in exploring digital public space. New knowledge emerged from the manipulation of existing online processes that both support and contradict the concept of integration between the physical and digital space. This was achieved by emulating the structure of existing online

environments, such as social networks, to create a framework that challenged data sharing practices. The familiarity of the design, such as login processes and screen-based messaging, both associated with social networks, was instrumental in investigating how interactions occur.

6.4 Digital Public Space (DPS) and the Creative Exchange (CX)

Digital public space was the core focus of the research within the Creative Exchange. Over the course of 3 years, issues relating to digital data sharing have been an integral element that shaped the landscape of the digital and physical environment. Despite its obscurity, the implicit relation between personal data and the individual increasingly impacts on the space they occupy, whether this is the physical public space of the high street, or the digital space of the social network. Data is generated that reflects and reinforces the presence of the individual and all the relationships that are governed by their actions. The research across the projects within this thesis helps illustrate the shift from understanding the digital space as another world to it now being fully integrated within the physical environment, which has implications for designers of hybrid, digital and physical spaces.

The Creative Exchange's intention to bring together 'design, prototyping and communication innovation' (creativeexchange.org, 2015) to create opportunities to explore often hidden and abstract concepts in physical environments. Creating a dialogue between partners and participants on diverse topics, from planning policy to making digital content physical, also created the opportunity for participants and partners to influence the discussion on digital public space. Where many of the themes reside within the digital environment and are not perceptible, the ability to

amplify or to manipulate a hypothesis and to make it physical meant that it could be investigated in a way that conventional research methods had not experienced before. The Creative Exchange fostered the use of creativity to explore complex theoretical arguments by bridging the divide within a modern public forum. This manifested outside of the academic environment and allowed collaboration between industrial partners and creative individuals from other disciplines.

6.5 Design challenges

The challenges for researching how digital content is shared can be demonstrated in the way in which digital content resides outside of the physical environment. Digital content is perceived to exist in an elusive other space, in cloud spaces and server farms. Online space is often portrayed as a non-descript, safe environment that has few boundaries in the same way physical objects and spaces are secured by political agendas or laws; and digital file sharing often occurs automatically between groups of people that are not physically present.

As few people have ever seen where their digital files reside, the challenge was to explore how to physically represent digital spaces and objects that do not physically exist. Digital files do have a physical component: they reside on hard drives, in discs, and on blades in server rooms around the world, but they do not physically resemble the object or space they represent. Files are constructed from binary values and rely on software and hardware to render them operable. Therefore, in order to explore digital public space and to answer the research questions, it was necessary to use

design methods to investigate digital public space. It was the following design methods that were instrumental in creating new knowledge.

In order to answer the research questions, the research design was divided between the digital space and the digital object and applied distinct methods to investigate how participants engaged with them. The digital space can be attributed to the online environment in which conversations and interactions take place, the social network sites of Facebook, Instagram, Twitter, and Skype are examples of how digital content is shared. The digital object can be recognised as a photograph, an audio file, medical record, bank details, and other forms of personal information. Dividing both physical space and object was specific to each case, in which distinct research methods were devised to support each project.

It would have been possible to explore the boundaries of online social networks through the medium itself, but the reason for not using social networks as the platform for investigation was that creating physical spaces produced contradictions that enriched the outcomes. This was evident when participants perceived the physical space to differ from their digital environment despite individual actions mirroring how they behaved online. Using existing digital spaces would not have generated such paradoxical results, as it would not have been possible to demonstrate the ambiguities described by the conflicts of the digital and physical association.

The research created opportunities to make digital objects and the digital space physical in order to investigate digital public space. The methods also represent new

ways to explore how to design for the emergent hybrid digital space, which encompasses the physical and digital environment.

6.6 Familiarity

The familiarity of the online environment has become an accepted space in which to share information and to communicate. Companies such as Facebook and Google are as familiar today as brands on the high street. Google has been operating since 1998, and Facebook since 2004. Just as high street stores create brand loyalty, the provision of both of these services is their ability to associate with friends and family, which has contributed to their growth. For the millions that use Facebook's services, the relationship with its services is the connection with family and friends. By association individuals do not consider signing up for the online services as a concern for personal privacy as friends intersect with the product. Facebook and Google are reliant on advertising, and benefit from the ability to scan the amassed personal details such as email, GPS locations, and image data, which drive targeted marketing messages. Although Facebook provides photo tagging in the United States, the European Union have ruled Facebook's system to be a violation of privacy (Europe vs Facebook 2016). Photo-tagging matches faces to names which could be viewed as a service in which the user is no longer required to post the photograph and suggest who resides within it; alternatively, facial recognition is now facing privacy lawsuits in the US as the technology has been recognised as invading users' privacy (USA Today 2016).

Google's rhetoric is that it provides services to help users. Google maps assist with navigation, while its online document editing and sharing tools aid an individual's

ability to collaborate with others and share files. The Chattr project was one example that revealed how the reciprocal trade in personal information for online tools is brokered. Participants at Chattr revealed how they were willing to share information with companies such as Google in return for services that are ostensibly free; however, as dependency increases, the benefit to the company providing the services is often overlooked.

6.7 Design methods for physical spaces

In both TILO and Chattr the manipulation of the physical environment was instrumental in creating new knowledge about the way in which the physical environment is less likely to be a trusted space for communication than an online space. The following two examples demonstrate how the manipulation of a physical environment can be used to measure the division between physical and digital spaces.

The design of the physical environment for the Chattr project represented the digital space of social networks. The methods emulated the logging in and agreement procedures of an online environment by driving participants to agree to the terms and conditions. In the process, the creation of a physical space amplified the awareness of how participants behave online. By making the digital space physical people were forced to consider the physical act of sharing conversations in a bounded space which did not comply with that of an online space. This created both an awareness and a hostility that was instrumental for the research. The outcomes

indicated that people did not wish to participate in sharing conversations within the physical space of Chattr, but felt safer and more inclined to participate online.

This format was repeated in a similar process during the TILO project, using the screens to influence the environment and to create a tension between the physical and digital space. Using the screen to publish messages to visitors as they passed through the gallery space at FACT created the ability to affect behaviour and public reactions. This was followed up by interviewing visitors to investigate whether they had been affected by the messages.

Both Chattr and TILO relied upon public perceptions that were manipulated for research purposes. This both drew upon fears that were represented in the replies in subsequent interviews, which gave way to references of science fiction and contemporary literature. The portrayal of an intelligent machine, in the case of TILO, was presented as an advance in modern smart technology that could assist and interact with visitors to FACT in Liverpool. The outcome revealed that, for most visitors, the screens were ignored due to the ubiquitous nature of cameras and screens or seen in a negative light and compared to the surveillance camera. The recreation of the physical space in both the Chattr and TILO projects caused tensions that could only be generated through the imitation of digital environments. The use of iPad tablets to control the screen in TILO also enabled the researcher to remotely control the screen away from the individual being studied, enhancing the illusion that the screen was technologically advanced and intelligent.

6.8 Design methods for physical objects

The physical environment was manipulated to study the effect of individual perceptions of data sharing in public places, and the creation of physical artifacts was designed to build new knowledge around the issues of how individuals share digital content. In order to understand how sharing content is treated it was imperative that the abstract nature of digital collections could be represented in a tangible way. The building of a solid object enabled participants to feel the tactile qualities of a physical item while also suggesting what forms of data could be embedded. The method of creating a physical format to represent something digital during the investigative stages allowed the research to have greater flexibility, by making physical objects that could be manipulated and reordered in either a one-to-one situation or by individual groups collaborating together. Both of these situations were applied across the research projects. During Physical Playlist students were asked to build their own personalised bracelet, apply digital content, and to identify with whom it would be shared; whereas during Open Planning, community groups were invited to collaboratively design the mobile phone application and to work towards identifying what content they considered the most important. Making a low-tech paper mock-up of a mobile phone model larger than life-size, combined with sticky paper icons, allowed the group to discuss and to rearrange the order with the freedom to rip, tear, and to draw upon the model that would later be photographed and passed on to the application designers to evaluate. These design methods advanced the research knowledge by using physical objects. Both Open Planning and Physical Playlist used prototyping as a method to engage participants

and to challenge data sharing practices, whereas TILO and Chattr created environments using Wizard of Oz methods to confront visitors to physical spaces.

6.9 Designing new questionnaires

Combinations of methods were used in order to overcome both the limitations and dynamics of the space in which the research was conducted. In busy spaces, where the public had little time to stop and answer questions, questionnaires were revised and designed to capture information in new ways. In TILO, time-lapse photography was used to record the movement of visitors, as well as recording the café space to illustrate how visitors use technology in public spaces.

Drawing methods, as opposed to questionnaires, proved useful in conveying complex information without the need to respond using text. The design of the visual questionnaire was developed after conducting research with traditional lists of questionnaires that was uninviting for participants in public spaces. The visual questionnaire was used for the Physical Playlist project and introduced during the Mozilla festival, a technology festival that attracted thousands of participants. To attract participants to engage, the questionnaire was designed to only require the participant to answer three questions; what content would you share? Who would you share it with? How do you share content now?

The use of symbols to represent people and digital content was used across the three questions. Using icons that could be drawn on, and linked together, created a matrix of information that revealed a richer understand of the relationship between

people and content. This information was later coded within an Excel spreadsheet and revealed how the relationship between digital content is currently shared, and how the introduction of a physical artifact affected personal perceptions of sharing digital content.

6.10 Benefits and limitations

Limitations can be identified by both the time afforded by academic and industry partners as well as the expectations from both sides that were imposed on each project. Creative processes explore and bring together converging ideas, which enabled individuals to work collaboratively and to investigate in a flexible and dynamic environment. This meant that research methods could be adapted to reflect the conditions in the field. While the short-term nature of each project often revealed the limitations of not being able to repeat the process in situ, the benefits of short-term processes, rapid ethnographic studies and the redesign of qualitative methods to gather data from individuals on the move all allowed for techniques to be developed and refined throughout the studies. For many of the projects, this manifested in the ability to create physical environments of digital processes, described in Chattr, TILO, and Physical Playlist, and supported creative research methods and generated original outcomes.

Working across a series of projects with multiple partners while writing to both academic and non-academic audiences created challenges and opportunities. The challenges manifested in the relationship between the projects and the connections with the individuals and organisations involved. There were three types of audience:

the partner, the Creative Exchange office, and the PhD research. While these all required different levels of information, they also required them at different times during; and after; the projects, completion. For example, a partner may have required a breakdown of information obtained from a focus group in order to justify the commitment for designing a mobile phone application (as in the case of Open Planning); the Creative Exchange office may also require this information to be reported back to the funding body as a report and a blog on the Creative Exchange website, and the data obtained may also fulfil the outcomes of the PhD thesis at a later stage of the project. The limitations therefore had implications for the research objectives as well as affecting the outcomes of the projects.

6.11 An example of expectations

Open Planning created the most divisions and demonstrated how the City Council disagreed with both the research methods and the outcomes. This was detailed in what the focus group required in a mobile application of planning applications and how the Council perceived the application. The expectations of the Council were that the research would supply a report to the planning office with recommendations to support a mobile application of planning notices taken from the planning portal system. The application was seen to be a product of the planning office and the Council requested that the application was formally branded with Liverpool City Council colours and insignia, which were not universally supported across the study.

Branding of the application was suggested to identify the owner and supplier of the planning information. However, this was reportedly down to fears of losing control

of planning information, in which the Council opposed the introduction of additional information being made public as they considered it would confuse the public. When it was suggested that images of a proposed site would be used in the redesign of the site notice and the mobile application, the planning team initially objected to the suggestion of the use of the images to the research group. The same message was later reiterated to the design team during the application development stage. The final prototype omitted any additional imagery and relied upon the existing data from the official planning portal to fulfil the objectives of the brief.

6.12 Research outcomes

The outcome of the research through a design-led approach has led to the following conclusions:

6.13 What are the perceptions of personal hidden data?

The study has indicated that:

- There is confusion over what constitutes personal data.
- Personal content is context specific, especially concerning what is shared and controlled.
- There are contradictions when sharing becomes value-laden and commoditised.

6.13.1 Confusion about what is personal data

The research reveals that personal hidden data was a difficult concept to articulate in a public forum due to the obscure nature of the subject. For many people during the research, personal data was related to where they lived, their online transactions

and correspondence. Each case study did not wish to impose a position on what constituted personal hidden data but preferred to let the public reveal their understanding of the term and for the research to investigate personal concerns and fears about how data was shared. This was supported by existing literature, identifying that individuals are concerned about losing control over data that relates to financial contracts (Dinev & Hart 2006). As the literature suggests, for each transaction there is a greater amount of data than is necessarily required (Son 2008). What this eludes to is the growing unease as individuals become aware of the data that is shared with third parties. The perception of trading personal information appears to be subjective, as individuals distinguish between different organisations and brands in order to quantify their actions.

6.13.2 Context and control

During the study the relation between individuals and personal data was dependent on the context in which the data was shared. Individuals perceived that they were in control of how their information was shared by using specific rules and processes to protect them. What was acknowledged during interviews with the public was that personal and hidden data was seen as malleable and could be manipulated and traded in order to maintain an online presence. This supports the study on strategy by Schelling (1960) for whom behaviour is motivated by 'a conscious calculation that in turn is based on an explicit and internally consistent value system' (Schelling 1960, p.4).

Techniques that support a value system were demonstrably adopted by individuals who used fake personal information as a means to subvert the standard practices of data gathering by online companies. This was all performed as a way for people to maintain a digital relationship with friends, family and colleagues, just as Schelling (1960) maintains that the same approach is employed in the pursuit of winning in areas of conflict.

The adoption of a value system was evident in the way individuals applied a ranking to their own personal data. Individuals employed a set of rules that they understood to be of benefit to themselves while believing they were protecting their personal integrity. This was confirmed through a series of encounters that revealed how providing misinformation, or omitting specific data when enrolling in specific online social networks, was performed.

This pattern of behaviour is consistent with Lampinen (2011) who suggests that individuals perceive to have greater control over their online space than their physical environment. This was reflected during Chattr in which some participants refused to enter the physical Chattr space due to the continually shifting parameters of the physical environment that were not perceivable in the digital space. This was in contrast with the participants who entered the physical environment but manipulated their behaviour and language in order to control the physical space just as they would do in the digital environment. While this is a perceived experience, it would suggest that location is specifically linked to the ability to share personal data.

Despite the omnipresence of an online environment, physical space appears to be key to how individuals perceive sharing personal data.

When the same participants were questioned about the use of CCTV, the responses indicated that they were unhappy but accepted camera presence, as it was something over which they had little control. When the surveillance methods of Chattr were introduced, the response was amplified, as this was seen to infringe on personal space to a greater extent than was performed online. While individuals acknowledged that the personal information they shared online was commoditised, they perceived that they were in control over who had access to this information.

6.13.3 Contradictions and commoditisation

As the previous sections have illustrated, there is a perceived understanding of what constitutes personal data and how control and ownership is manipulated. The study also identified a flexibility that is dependent on a value system in which control is relaxed when a reciprocal trade occurs. An example described during the TILO interviews was the recognition that supermarkets trade on repeat visits and offer coupons based upon the individuals' most recent purchases. This was also explored during Chattr when users identified that they share personal information with social networks in exchange for access to converse with friends and family. The sharing of data was seen as a fair trade for free online services, which is backed up by the study by Statova et al (2013) who indicated which services individuals are willing to protect by paying for it. The results, highlighted within the analysis chapter, reveal how individuals perceive bank information to be more valuable than social network data.

6.14 Where do the concerns of shared, personal hidden data come from?

Concerns emerge from:

- The reliability of online news broadcasting.
- The rise in social networks as the primary source of information.
- A legacy of personal fears of surveillance and control described in literature and media.

6.14.1 Concerns emerge with the reliance of SNS as primary source of news

The reliability of individual judgments can be linked to the validity of online news reporting. As the Pew Institute and World Economic Forum have shown, the increase in reliance on online communication as the primary source of public information has led to concerns over the legitimacy and quality of shared information. It has been argued that the dependence on technology and a growing trend for audiences to receive news only through online channels has led to the spreading of unreliable information across global, online networks. When compared with the legacy of traditional media, such as television and print media, there is a perception that these were less credible with audiences than online media (Kiousis 2001). Newspapers were perceived to be more credible than television; and interestingly, internet news was also seen to be more credible than television. What is not covered is the relationship between these media outlets is the 'interpersonal communication' (Kiousis 2001, p.396) that occurs between news events and personal interaction. Kiousis suggests that, while television news viewing is perceived as a group activity, viewing news online is predominantly a solo activity. When these facts are combined with the Pew Institute study, suggesting that 72% of online adults gain their news

purely online, it demonstrates how online media amplifies personal concerns. Media stories raise fears over identity theft and invasions of privacy but these tend to be speculative. Headlines such as 'Outrage as site removes privacy option' (Daily Mail, 11 October 2013) was published the same day the privacy function was removed from the media service but at no time has been reportedly tested by its clients, this definition of outrage had not come from its users but from the media itself.

6.14.2 Personal fears of surveillance

In addition to the reliance on online communication, what was evident from interviewing individuals during the TILO and Chattr was a perceived fear of technological advancements that endure through a fictional lens of popular culture and literature. References that resonate within fictional narratives of science fiction literature and film, such as the novels *Nineteen Eighty-Four* (Orwell, 1949), *Brave New World* (Huxley, 1932), *The Sentinel* (Clarke, 1951), and *The Minority Report* (Dick, 1956) were referred to across the projects as individuals described their fears. The film of the short story *Minority Report*, written by Philip K Dick (1956) and directed by Steven Spielberg in 2002, used the concept of machine intelligence and facial recognition to push information to individuals as they passed high-tech public screens. The resemblance of TILO to the *Minority Report* scenes was reflected in the responses from individuals as they described their reluctance to engage. References to Orwell's Big Brother and Clarke's image of HAL also were ever-present when participants responded to questions of machine intelligence. This was evident from the TILO study in which participants referred to 'Big Brother', '1984', and 'Orwell',

terms associated with the novel, *Nineteen Eighty-Four*, by George Orwell and a reference that has its origins in state surveillance and control.

It would appear that, for many individuals, the relationship between the fictional representation of surveillance and control resonates within a public psyche and has the ability to lead to misinformation. This was demonstrated in TILO in which screen technologies were described as intelligent, and participants made assumptions on how best to protect personal data in advance of the potential surveillance threat. Despite the TILO screen representing little more than the 'wizard' behind the curtain, the public exhibited an unease and suspicion with the possibility of a technology taking information without consent.

6.15 What is the tipping point where shared, hidden personal data become a concern?

Tipping points occur when one or more of the following conditions arise:

- The trade in personal information is no longer reciprocal and becomes unbalanced.
- The organisation and brand is unknown or untrusted.
- There is a lack of control of personal data.
- The physical location is untrusted.

From the analysis of the case studies, a lack of trust forms a major reason why individuals are reluctant to share personal information. However, trust is also bound with reciprocity, as the commodification of personal data becomes the tipping point in which individuals treat the sharing of personal data. As I have previously

acknowledged, the relationship is contradictory: perception of what constitutes personal data, combined with what that information will be used for, has a direct impact on what individuals are willing to share. When questioned, individuals acknowledged that they shopped online, shared personal information on social networks and participated in conversations with individuals they had never met in person (see Chattr in case studies). However, as described in the Chattr project, by creating a representation of an online space in a physical environment, the case study raised the awareness of the transactional data sharing processes and the understanding on the part of participants of the risk of sharing information online. This resulted in a reluctance to share personal information if the environment was not trusted.

The familiarity and branding of the environment became a critical factor in the way in which the participants interacted and exchanged information. As Chattr demonstrated, the lack of a recognised brand made individuals warier than if they were interacting in an environment in which they were closely conversant. This was evident between Chattr and TILO, in which the differences represented similar technological tensions; and yet, the environment and branding of FACT in Liverpool was perceived to be a trusted safe space in which to interact. Individuals acknowledged they were confident that sharing a limited amount of personal information in exchange for a more personalised service would be treated with discretion, despite there being no formal agreement with FACT to honour this. The physical place, and the apparent trust, became a critical factor in how personal data was exchanged as individuals felt safer engaging directly within the organisation.

However, the TILO study demonstrated that as the request for personal information increased and the reciprocal exchange seemed to decrease, a tipping point in which it was no longer personally profitable to exchange information was reached. This resulted in a breach of trust in the perception of data exchange and the relationship was broken.

Table 11 Tipping points by project, demonstrates how the trade in information is based upon either a reciprocal exchange or a withdrawal. The table demonstrates a nuanced relationship between trust and the reciprocal exchange for services or goods. When both the trade and trust is low, participants withdrawn from sharing, provide misinformation, or remove information as a result of a lack of trust and control of their personal data. Chattr demonstrated a lack of reciprocal trade combined with a lack of trust, which led to a lack of participation as well as misinformation. In TILO, the exchange of information when the data represented a low data exchange (gender or age) was considered amicable, whereas as the exchange increased leading to a higher data exchange (such as personal address, friends and family data) the results led to a withdrawal of data sharing. In Physical Playlist there was a low level of reciprocal trade, but a high level of control increased trust which led to larger levels of data exchange. Despite the low reciprocal trade the participant considered control of the data to be high, which encouraged an exchange of personal data.

Table 11 Tipping points by project

Project	Reciprocity		Trust		Leading to
	High	Low	High	Low	
Chattr		✓		✓	Misinformation Withdrawal
Open Planning		✓		✓	Withdrawal
TILO, low data	✓		✓		Exchange
TILO, high data		✓	✓		Withdrawal
Physical Playlist		✓	✓		Exchange

When the space between the digital content and the individual was removed, in the case of the Physical Playlist project, trust in how the data could be shared increased exponentially. The projected figures during a Physical Playlist workshop demonstrated that sharing personal information rose from 26% to 56% between family members if digital content was made physical. The findings suggest that trust is based upon ownership and the familiarity and physical closeness to personal digital content. Making content physical creates the ability to share in a more tangible way, whereas the current model for storage and distribution of digital content is disconnected from a material environment. Digital content relies on server farms, also known as cloud storage, that distributes content in a scattered but dependable repository. On the one hand, storage of data can be forgotten and ignored when it is represented in an off-site cloud; however, the ownership of this content is often not known, just as the location is fragmented across servers and time-zones.

As the public becomes more aware of how their data is used by third parties, the storage of personal information online also comes into question. Not only is content

open for analysis; so too are the laws that govern personal content. For example, if my personal email account is stored in a different continent to the one in which I reside, the laws governing my privacy are not the same ones as the ones that govern the content of my personal correspondence. The process of returning content to a physical form embraces the issues of ownership and trust whilst reverting control to an individual to protect it. The evidence of a tipping point was articulated within Chattr, TILO and Physical Playlist most frequently. The visitors to Chattr indicated that they were reluctant to share the space while everything within the space was recorded.

6.16 How does shared, personal data affect personal digital storytelling through collective and connective memory? And how has collective and connective digital memory affected the notion of storytelling?

Personal storytelling is affected by a) the automation of Social Network Sites (SNS) creating historical timelines of individuals lives, and b) the instantaneous posting and algorithmic prioritising of messages and images by Social Networks Sites on timelines which leads to automated, relational storytelling. This requires further investigation and was not possible to evaluate during this study.

While this question was defined during the early stages of the PhD, the analysis of the data from the four studies has not resulted in conclusive evidence to support this question. It can be surmised that a combination of personal data sharing through social networks, combined with the connective practices of many Social Network Sites, has the ability to influence the collective memory of individuals. In a recent

study entitled, 'Experimental evidence of massive-scale emotional contagion through social networks' (Kramer et al. 2014), the mood of Facebook users was manipulated by filtering news directly to 'individuals', Facebook page. The report indicates that when news stories were mediated by the Social Networks Sites, it had an influence on individual behaviour. While the study was criticised due to its unethical behaviour, as it did not inform participants of the study beforehand, or during the trial, the ability to affect individual moods was seen as 'emotional contagion' (Kramer et al. 2014) as the spread of negative or positive news took hold.

In comparison with the organic methods of data distribution described in the case of Hurricane Sandy, this reveals that personal information has the ability to run amok and to influence behaviour (see Literature). Where this was identified within the study of Physical Playlist is in the ability for individuals to collate and distribute a series of digital triggers that relate to the individual being targeted. Just as Social Networks Sites create automated timelines that are predicated on frequencies of followers and connections, often ignoring the less frequented images, our memories of past events will ever be influenced by the algorithmic priorities that are hosted within Social Networks Sites.

The ability of Social Network Sites to affect and influence social behaviour is an area for further research, especially in the use of photography, as the image continues to replace the written word.

6.17 Further research

Within all four case studies, the potential to continue the research into additional contemporary data sharing practices was substantial. While the projects provided a large amount of information about how individuals share personal information, the outcome of the data generated further queries. The research within the literature in Chapter 2 and case studies in Chapter 4 has illustrated that the demise of the central storyteller, combined with the increasing reliance on online news bulletins, and the ability to connect whenever, wherever has implications for how individuals perceive the world. My research has identified the fears and concerns of sharing digital content and, as reliance on sharing digital data proliferates across multiple online platforms there is an increased awareness and interest in understanding how individuals respond to the threats and violations to personal security breaches. Just as Chattr, TILO, and Physical Playlist projects invited participants to explore digital public space, this environment continues to represent a new space in which threats to personal privacy and trust will continue to be tested. Future research in this field is needed which investigates how the next generation of online tools will be used.

6.18 Recommendations for designers

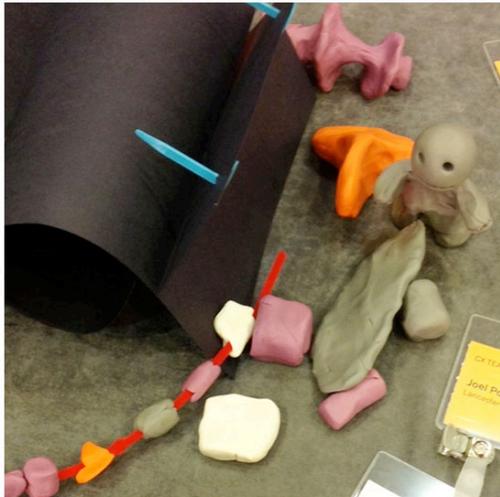
The following table provides a series of recommendations for designers investigating the subject of physical data objects, reciprocal trust, control of data, and the tipping point when trust is no longer perceived to be equal. Table 12 describes a range of methods and tools required and Figure 33, Figure 34, and Figure 35 demonstrate the connection between the methods used to the subject of enquiry.

Table 12 Methods for designers

METHOD	DESCRIPTION	TOOLS REQUIRED
Creative toolkit	Using a collection of elements to allow modeling and creative design through participation. Further information: Sanders et al. (2001), 'Harnessing peoples creativity'	Interface kits: paper and card, velcro for Attachable objects. Collage kits: paper, card, scissors, images and words. Drawing kits: paper, card, markers, pens. Play kits: modeling clay, pipecleaners, Lego.
Prototyping	Creating a physical object that can be tested with users. Further information: Arent (2006), Interactions, The art of prototyping	<i>Basic:</i> card, scissors, scalpel, cutting mat, glue, tape. <i>Advanced:</i> workshop, cutting tools, drill, wood, acrylic, Laser cutter, 3D printer.
Participatory Design	Inviting users and stakeholders to engage during the research of the design stages. Further information: McNiff (2002), Action research for professional development	Paper, card, markers, post-it notes.
Observation	Systematic recording of people, artifacts, environment, events, including behaviours and interactions.	Diary, camera, audio recorder.
Questionnaire	A tool to collect qualitative and quantitative survey information.	Paper or digital questionnaire
Interview	Recording of experience using direct contact with participants.	Camera, camcorder, audio recorder.
Wizard of Oz	Used to make participants believe that a system is real, while a researcher is	Designed interface or interactive environment already established within

	<p>manipulating the system behind the scenes.</p> <p>Further information:</p> <p>John F Kelly (1984), An interactive Design methodology for user-friendly natural language office information Applications</p>	<p>the physical or digital environment.</p> <p>Prompts and triggers to create interaction.</p> <p>Camera, camcorder to record interaction.</p>
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Across the four case studies a range of participatory design tools were implemented such as the use of creative toolkits, participatory workshops, and prototyping. The use of photography was primarily used to document the results of each project whilst used to record the methods themselves. Figure 32 Participatory and observational research methods, demonstrates the use of photography as an analysis tool whilst also being used as a method for documenting a range of methods. The images represented within Figure 32 document the following methods: 1 - Creative toolkit (Documenting creative lab outcomes); 2 – Observation (used to investigate how users engaged with data objects); 3 - Wizard of Oz (Researching user engagement with digital screens and interactive messages); 4 - Participatory Design (Documenting workshop and design of mobile application).



1



2



3



4

Figure 32 Participatory and observational research methods

In order to understand the reciprocal trade in personal data, and how individuals perceive to take control of how data is shared, a mixed methods approach was designed to investigate these research areas.

6.18.1 Reciprocity

The reciprocal trade in personal information and the tipping points in which individuals determine how much personal detail they are willing to share can be investigated through interventions such as the use of Wizard of Oz methods. Figure

33 highlights the steps required. Initially the creation of a controlled environment is established and then observed. This can be followed with further interviews and questionnaires during or after the event.



Figure 33 Methods for Reciprocity and Tipping points

6.18.2 Empowerment

The investigation of empowerment (see Figure 34) can be explored using participatory design methods with the aid of creative toolkits to enable participants to create and act out creative scenarios. Similarly to Wizard of Oz methods, participants are invited to engage within a designed environment in which they are requested to use toolkits to design and build physical objects that enable them to gain control. The use of observational tools can be implemented to document the workshop and later used during the analysis; additional methods such as interview and questionnaires can also be conducted during or after the event.

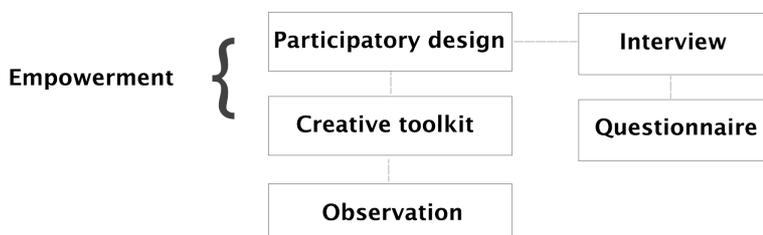


Figure 34 Methods for Empowerment

6.18.3 Physical Data objects

The investigation and creation of physical data objects uses participatory design methods, combined with creative toolkits that allow participants to rapidly create physical objects using a range of construction materials. The design and creation methods can be an iterative process in which the outcomes of exploratory workshops allow early prototyping to be designed and tested (see Figure 35). Prototypes are the realisation of the participatory design process and early designs can be further tested with further evaluation methods.

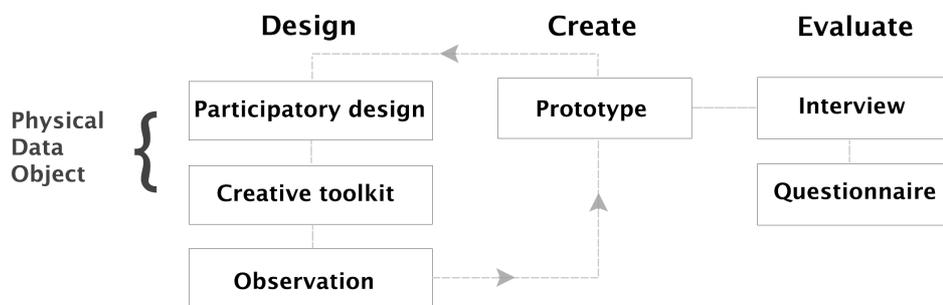


Figure 35 Methods for Physical Data Object

An example of the design and creation process in which methods were combined can be demonstrated within the Physical Playlist case study (see 4.3 the Physical Playlist). The Physical Playlist used creative toolkits, participatory design, prototyping, and questionnaires to investigate how physical data objects were shared.

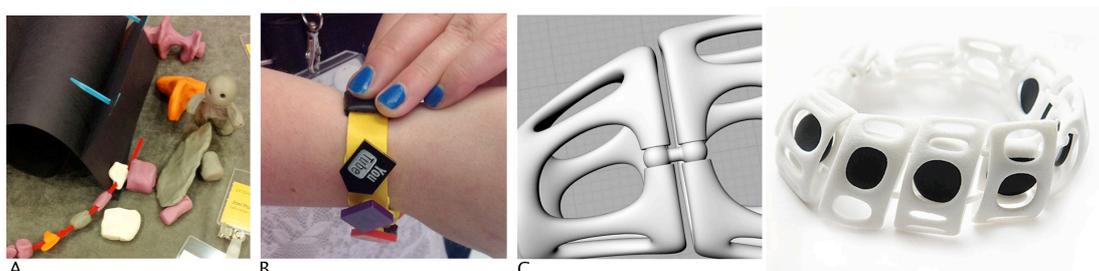
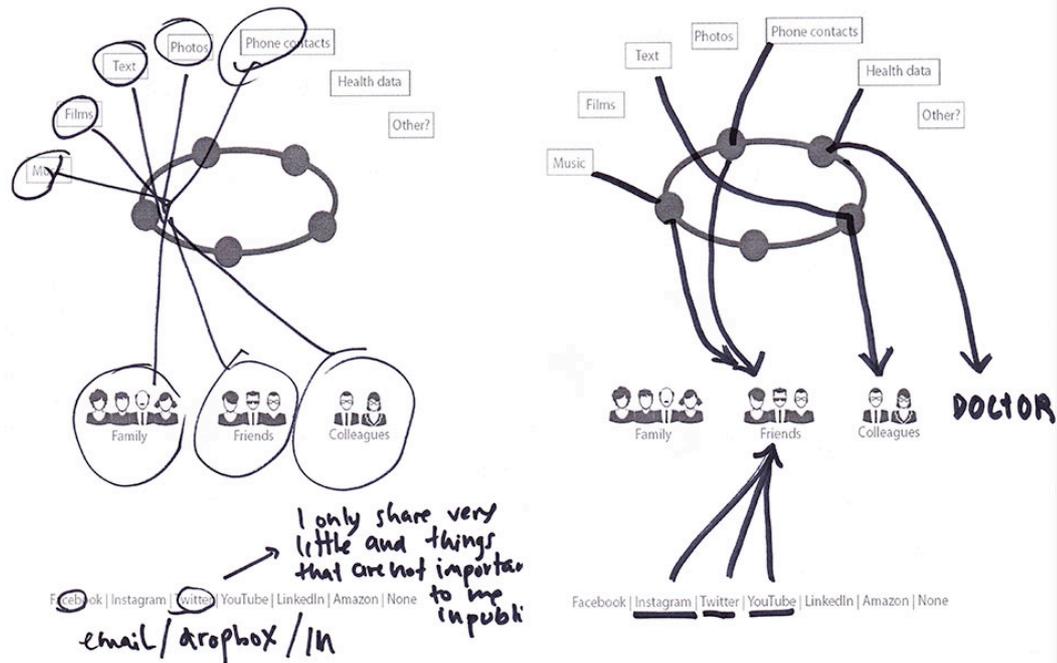


Figure 36 Creative toolkit to final prototype



I only share specific content with specific people

Figure 37 Physical Playlist questionnaire

Figure 36 and Figure 37 represents the methods used in the design of a wearable data object. The design of the object was initiated during a creative lab that brought together creative partners and invited them to participate using a creative toolkit with an objective to make the digital physical. The images within Figure 36 demonstrate the process from the initial design concept to the final production of the prototype. The research was initiated using a creative toolkit. Image A within Figure 36 uses modelling clay to make a physical representation during the creative lab event. As the research developed, participants were invited to interact with an early mock-up of the object that was designed around a bracelet structure (Image B); this led to the prototyping of the finished 3D printed object (Image C). Finally, questionnaires were used to evaluate participatory responses to the final design. Figure 37 demonstrates how participants would implement the data-sharing bracelet and what forms of data they would share.

While my research revealed how people perceive sharing personal content in public spaces, further research into how the perception of physical spaces affects trust online has the potential to combine research opportunities in psychology, computing, and urban planning. In TILO, the results of the interviews with visitors created additional questions in which new issues emerged, such as the person who published emotional responses to events as opposed to what they were doing. This raised the question of whether there is an increased emotional connection to sharing information online as familiarity increases, but further research could explore how sharing personal experiences online affects the physical boundaries in which emotional ties were previously experienced. If one is collectively sharing personal experiences online, and physical connections are reduced, are they potentially less relevant?

The Physical Playlist project engaged with the emotional and physical issues of sharing personal information. The project has potential to change the way people think about controlling their own personal data and how it is shared. In contrast the Open Planning application has possibilities to be utilised across all council boroughs in the UK and to integrate with other online platforms as a method for engaging communities to get involved with local planning decision-making. Just as the service, Fix My Street (www.fixmystreet.com) maps and reports street problems to the councils responsible for fixing them, this enables individuals to collectively engage and to discuss local issues, Open Planning could be integrated with social networks as a way of engaging new audiences and building upon existing infrastructures.

Within all the projects the questions revert back to the contemporary methods for sharing personal data through the use of social network sites. Additional research in this area of social network sites use is ongoing, and projects that interrogate the way in which personal data is shared helps to develop new systems to safeguard individuals that use them. Issues of trust and privacy through sharing of personal information is increasingly becoming a collective phenomenon as personal content is shared online and co-owned by multiple users (Ilia et al. 2015), the consequence of which can lead to severe privacy violations (Thomas et al. 2010). While other studies have concentrated on the risks of sharing personal text based data online, the use of photographs as a form of transactional and personal information is less understood. As millions of personal photographs are uploaded daily, they are shared and distributed without the permission of those in the photographs. The issues of sharing photographs as a form of storytelling (Miller & Edwards 2007) has shifted, and today represents a form of social interaction (van Dijck 2008b). For many, photographs did not seem to constitute personal data. This has the potential to lead to conflicts between the individual that took the photograph and those represented within the image, which has the potential for further research. One project that aims to understand the area of personal multi-party conflicts in social networks and one in which I was involved as a research assistant is the Reprico project (Such 2016) within the Computing Department at Lancaster University. The aim of the project is to investigate how personal photo sharing causes conflicts in social networks and to understand how people manage conflicts in which other people appear. Focusing on how photographs posted on social networks cause personal conflicts and how they

are resolved, the research invited over 1000 online participants to answer a series of questions in order to identify how multi-party privacy conflicts occur, with whom there was a conflict, whether it was resolved, and what methods were used during the resolution process. The Reprico project aims to empower users by creating new processes to combat data aggregation and for users to regain control of how their content is used.

The Reprico project isolated participants to identify those that had taken the photograph and had received a complaint, from those who had been the subject of the photograph. What this identified is a mismatch between the control of the photograph and those photographed. The early research findings have identified that it is not the photographic content that causes issues of conflict; it is how the image is perceived outside of the immediate group that shared it. As Donath (2014) has identified, social networks do not adequately protect individuals from data being shared, and while individuals do not consider photographs as personal data it demonstrates how shared personal data sharing leads to further negative consequences.

6.19 Conclusion

What this study highlights is that individuals make personal choices based upon a level of perception of trust and reciprocal trade. Within each project the question of data integrity, who has access and who governs this information, was a question of debate. As I have established within the literature and the case studies, the studies on awareness and acceptance, ownership, reciprocity, and trust reveal how personal

data sharing has the potential to erode personal privacy and threaten personal trust. The World Economic Forum and the Pew Institute have also acknowledged that personal information sharing has the ability to cause global financial instability, as well as social unease and insecurity. It has also impacted upon global communication, and commercial systems that aggregate personal content.

The results of this study highlighted that individuals perceive to be in control of their personal information and understand what personal information entails. However, the research has highlighted that assumptions are often made based upon the spread of false or poor information and hearsay. Other forms of misinterpretation can be attributed to a lack of understanding how technology works, which was often falsely reported through traditional media channels, as I have previously highlighted in the example of Facebook listening to conversations in order to provide a better service (see 5.3). The research highlighted that a loss of control of personal information divided opinion. While one group perceived itself to be in control, there was also another that demonstrated a carefree attitude that did not acknowledge a personal risk in the data that was shared; this group also showed a distinct lack of interest in who had access.

This division was most evident between the research conducted in TILO, Open Planning and Chattr. In TILO, the building (FACT in Liverpool) reinforced the relationship and trust between the individual and the organisation; in Open Planning the fear of losing control of data into the public domain was voiced by the city council; while in Chattr, the lack of control created a tension between the

individuals, understanding of what constituted personal information and what they were not willing to share in return for access and services. This was demonstrated with participants in Chattr who showed little concern for sharing personal information and readily accepted the terms, but did not read the consent forms before entering the space. While there was a polarity between individuals of the perceived risks of sharing personal data, the majority of cases perceived the trade in personal information as reciprocal, and while services were free to use they considered the exchange fair. For many, the benefits manifested through mobile devices that used locative mapping services and communication tools, all of which required personal information to function. In these cases, the benefits outweighed the concerns and was not perceived as an infringement on personal freedoms.

As a result of the TILO, Open Planning, and Chattr findings in which fear of data sharing was most evident, an antidote to the existing online data-sharing environment was Physical Playlist. The Physical Playlist project demonstrates how an alternative platform could be developed to address the fears identified throughout the study. By creating an environment in which personal content was embedded and shared through physical objects, the onus of control shifted back from the corporation to the author. Just as TILO reinforced the relationship between the individual and the organisation, the proximity between the digital and the physical created a level of trust. This can be summarised by the response by one individual during TILO who suggested that being in your own home makes you feel safer when you are online. Despite this sentiment having no logical basis in the context of being online, proximity to a familiar space increased trust was reinforced by a number of

individuals. As in Chattr, the reference to the aesthetics of the space highlighted how the representation of the online environment had a profound effect on the way in which individuals behaved in digital public space.

The relationship between digital content and physical space described within this thesis has revealed levels of trust while also acknowledging concerns over state surveillance at a time of political uncertainty. Fears relating to personal security have increased since the terrorist attacks in New York in 2001 and London in 2007, which prompted governments to increase surveillance of its citizens (Lyon 2003; Lyon 2014). These fears relate to concerns over personal security that manifest in both physical and digital space. A Gallup poll in March 2016 (McCarthy 2016) suggested that 48% of Americans worried a great deal about terror attacks, whereas a similar study in 2014 (Riffkin 2014) identified that 62% of individuals were concerned about having their computer or smartphone hacked and the information stolen. In response, both the US and UK governments have suggested that while there is an increased threat of terrorism, monitoring of personal communication is integral to protecting both state and individual security.

The UK national security strategy, *A Strong Britain in an Age of Uncertainty* (2010), states that the UK is, 'one of the most open societies, in a world that is more networked than ever before' (HM Government 2010). In the pursuit of counteracting emerging risks, the strategy identifies that national security is at the forefront of decision making, in which the UK government decisions are connected to global events that have repercussions for the strategic defence and security of the country.

The implications suggest that, in order to protect the public, stronger relationships between government and the private sector will be required, as 'business and government will need to work much more closely together to strengthen our defence against cyber-attack' (HM Government 2010).

A consequence of building closer ties between government and the private sector is the ability of state agencies to access and share personal information. Between 2010 and 2015, the proposed objectives of the UK Government was to establish a Communications Data Bill which would grant greater access to personal data for security agencies, as well as access to encryption keys for all personal secure data. Just as the Total Information Awareness (TIA) programme in the United States had established a surveillance model in 2002, the UK government had correspondingly put forward a similar plan to monitor personal communications. The Draft Communications Data Bill (alternatively known as the Snoopers Charter) was proposed for consideration by the former Home Secretary, Theresa May, in 2010 as part of the UK coalition government's fight against terrorism. The plan required internet service providers and mobile phone companies to store individual phone records and browser activity for twelve months and make it available to security services without the need of a warrant. The bill was opposed by the former Deputy Prime Minister, Nick Clegg, and eventually blocked in 2013. Similarly, the European Court of Justice (ECJ) identified the interception of communications data was a breach of Article 7 and 8 of the Charter of Fundamental Rights of the EU. Article 7 recognises the respect for private and family life, while Article 8 identifies the protection of personal data in which: 'Everyone has the right to the protection of

personal data concerning him or her' (European Union 2000). In addition to the proposed government plans, the former UK Prime Minister, David Cameron had earlier indicated a wish for all encrypted data to be easily accessible to security agencies. The justification in providing governments the ability to access encrypted files was also cited in the interest of national security for anti-terrorism measures.

The instability of government relations within the UK and across Europe at the time of writing this thesis has exacerbated fears over personal data sharing as the UK begins its withdrawal from the European Union. Both the 2015 election, and the Brexit decision for the UK to leave the EU (a result of the European Referendum on 23 May 2016) is likely to re-establish the proposed Communications Data Bill in light of the lack of an opposing political agenda. The potential for searches and retrieval of personal data to be accessible by government agencies is likely to increase as the protection by the EU charter is replaced with a new Bill of Rights, as originally proposed in the 2015 Conservative Party manifesto.

As speculation of an increase in personal surveillance through the reintroduction of the Communications Data Bill continues to grow, the implications for sharing personal and private information has the potential to threaten public confidence about what data individuals are willing to disclose. A direct consequence of the proposed changes across the UK after the 2015 general election has subsequently resulted in the Ind.ie company, an IT company specialising in file sharing software, leaving the UK and moving to Malmö, Sweden. This move was the result of concerns facing the Ind.ie team that government interference would hamper the development

of private communication technologies the company was developing. Aral Balkan (Director of Ind.ie), in a statement on his personal website, states the reasons for leaving the UK relate to the, 'ramifications of electing a Tory government that make it impossible for us to carry out our mission of creating technology that protects human rights and resists mass surveillance while living in the UK' (Balkan 2016).

In 2004, the British government produced and distributed a pamphlet to all households as a guide to assist in identifying 'hazards and threats that may disrupt their lives' (HM Government 2004). At the time the document was criticised because it was perceived to increase anxieties and was subsequently parodied across the internet (Scott 2004). The official document, *Preparing for Emergencies* (2004), provided information relating to extreme weather, terrorism, and cyber-crime with guidance on how to combat them. For protecting personal data online, the document offered the following advice: 'Make sure that you know exactly what you're sharing, and who you're sharing it with' (HM Government 2004). As this thesis has identified, while the increase in data surveillance continues to disillusion a minority of individuals, the majority continue to share personal data without knowing with whom they are sharing. Protecting personal information in the future will continue to be challenged. Meanwhile, performing virtual identity suicide (see 2.14 Misinformation contributes to fears of data sharing) has perhaps become the ultimate form of personal protection.

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8 Appendix

8.1 Chattr

8.1.1 Chattr decliners survey

Q1. Do you have an online account with any of the following online services?

- Facebook
- Twitter
- Flickr
- Amazon
- YouTube
- None of the above

Q2. Do you share personal photographs, video or conversations online?

- Photos
- Video
- Text conversation
- No

If 'No' go to Q4

Q3. Have you ever shared content or had a conversation online with someone that you do not know personally?

- Yes – using my personal account
- Yes - through my work account
- No - never

Q4. Do you shop online?

- Yes
- No

Q5. Do you have a supermarket loyalty card?

- Yes
- No

Q6. Why did you not wish to participate in Chattr?

Figure 38 Chattr Decliners Survey

8.1.2 Chattr survey results

Table 13 FutureEverything survey results

Questions	Total (participant responses)
Q1. Do you have an online account with any of the following online services?	
Facebook	18
Twitter	20
Flickr	18
Amazon	20
YouTube	17
Q2. Do you share personal photographs, video or conversations online?	
Share photos	18
Share videos	10
Share conversation	16
No	2
Q3. Have you ever shared content or had a conversation online with someone that you do not know personally?	
Yes – using my personal account	17
Yes – using my work account	13
No – never	2
Q4. Do you shop online?	
Yes	21
No	0
Q5. Do you have a supermarket loyalty card?	
Yes	10
No	11

Table 14 TodaysArt survey results

Questions	Total (participant responses)
Q1. Do you have an online account with any of the following online services?	
Facebook	5
Twitter	2
Flickr	4
Amazon	2
YouTube	5
Q2. Do you share personal photographs, video or conversations online?	
Share photos	4
Share videos	1
Share conversation	4
No	2
Q3. Have you ever shared content or had a conversation online with someone that you do not know personally?	
Yes – using my personal account	2
Yes – using my work account	3
No – never	3
Q4. Do you shop online?	
Yes	6
No	1
Q5. Do you have a supermarket loyalty card?	
Yes	0

Chattr interview data Responses to Question 6: Why did you not wish to participate in Chattr?

#01

I didn't want to offend anyone by transmitting the conversation online.

#02

Didn't want to share personal information to people that they did not know.

'Online conversations are less personal but I am happy to have a conversation in a professional environment'

Note: Chattr is seen to be a personal space, and therefore not suitable for sharing, whereas the online space is more professional.

#03

I didn't know what to say in the environment of Chattr.

#04

Didn't have anything interesting to say (professionally).

Didn't want personal content made public.

Note: Participant thought that Chattr was a professional discussion area and therefore didn't have anything of relevance to say in this space.

#05

Discussions unfit for public in event space, conversation was not of professional context.

#06

May participate later on.

Not familiar with being recorded and published online.

Don't do this online, I don't have dialogue / conversations online.

Only converse with services and not individuals.

#07

I would have to control my conversation.

I control what I do online, so wouldn't do this anyway.

Note: user has twitter but doesn't use it.

#08

Would have to have constant vigilance, with the lack of focus (that you would normally have online) would lead to having to watch conversation.

Always thinking, all of the time.

Online is the 'last place for personal conversation'

Chattr is like 'Google Glass without the glasses'

Wary of professional confidentiality of projects that could be overheard/published.

With online places such as twitter **'the aesthetic frame defines the place'**

Note: References to Gartner hype cycle were also mentioned.

User uses Flickr paid version, has access to YouTube because they have google account, and does have conversations online but through Blogging and not via Facebook.

#09

Not enough perks

'Annoyed' by the lack of free goods, coffee, would have participated otherwise.

Q. Isn't it the same online that you just get a better experience, you physically don't get things?

No, online you can see friends photos, see them using Skype, which saves money through saving physical train travel and visits.

Note: User uses Facebook for personal, Twitter for professional conversation.

#10

Nothing interesting to say

Conversation through Chattr would make me much more aware of having a conversation in public.

'Chattr is indiscriminately broadcasting'

Offline is safer in this environment

Online is insidious

I make a conscious decision not to broadcast on an everyday level.

Note: The barriers of the microphone and the clipping on etc also put them off

#11

Didn't see the value in the chattr experience.

'I don't know what the value exchange was, with Google Streetview you do, it's not just about the physical vs online, it's about value.'

#12

Nervous about being recorded

Not what to say, just nervous.

Note:

User has Flickr account but doesn't use it

Shares photographs only through photographs that they take on own camera.

#13

Felt it forced conversation

Consent form – too much to take in, too much text to read before considering entering

#14

Stops natural conversation

Conversation would have been just about being in Chattr so did not wish to participate

#15

I was on my own so would not have had a conversation

Q. You could have entered into a conversation with a stranger?

A. It would be impolite to have a conversation with someone you don't know if you know it is being recorded.

#16

I don't have time, and **online is more fluid.**

#17

'I would but only as a research project, if this was in 'Costa' I wouldn't, no way'

#18

Don't want to share conversation.

'Online is private, I set my settings to private, only personal/friends can access'

Q. No amount of free tea/coffee would entice you?

A. No, never

#19

Online is planned

Chattr is overheard and spontaneous which I wouldn't do online.

#20

On own, so no conversation

Atmosphere not conducive

Thought they had to engage with technology and didn't want to do techy stuff in that space

Note: between the barriers there was the option to connect and use a digital projection, the user mistakenly thought that the space was for participating solely with the technology.

#21

Not approachable, the signage put them off.

They were informed via a colleague and hadn't seen the acceptable use policy.

'Exclusion rather than inclusion'

Noted that documentation was not in the conference programme.

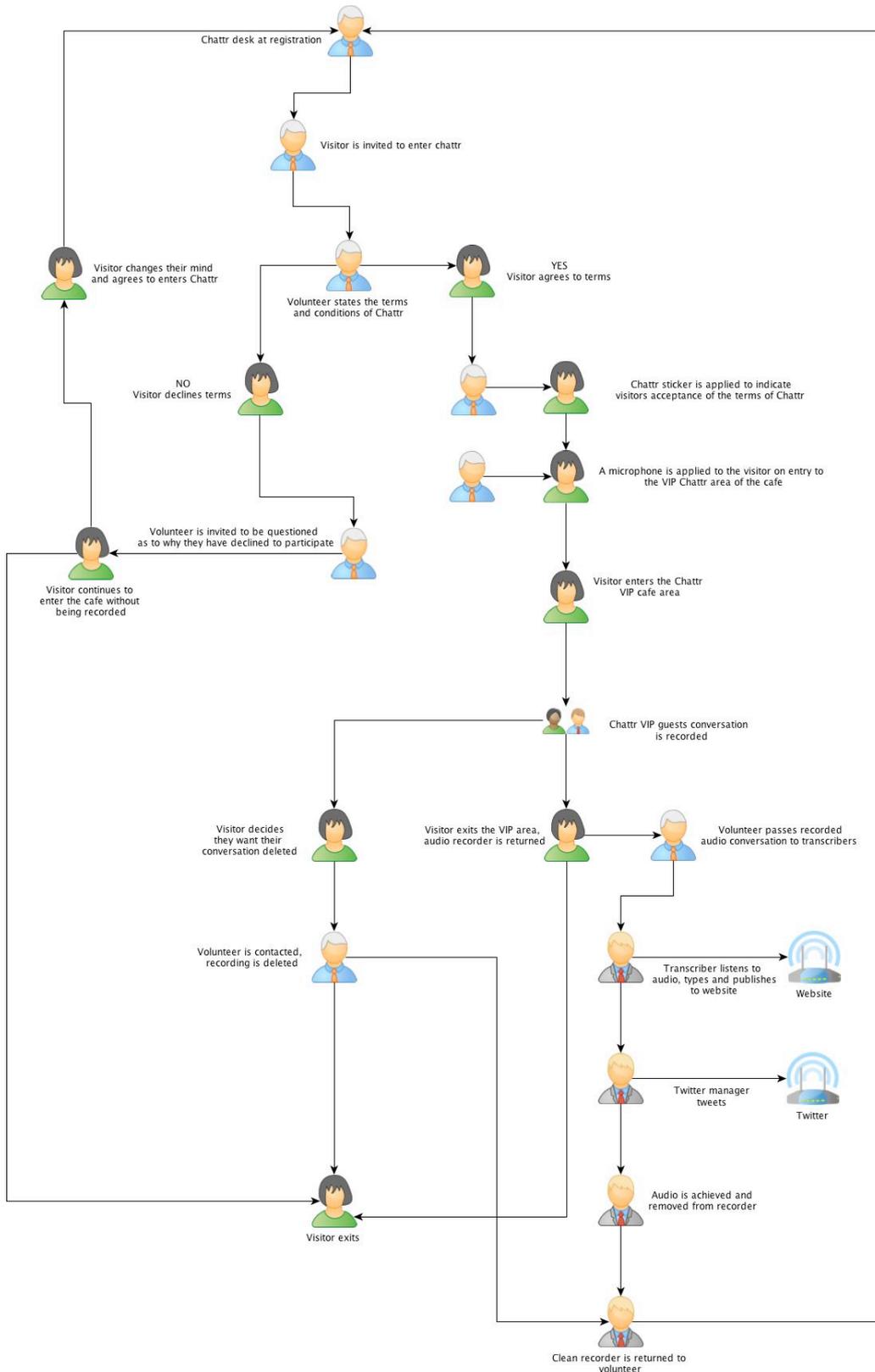


Figure 39. Chattr flow diagram designed for FutureEverything

8.1.3 Chattr data use policy

By choosing to have access to the Chattr lounge, you agree to this Data Use Policy.

Your privacy is very important to us. We designed our Data Use Policy to make important disclosures about how you can use the Chattr lounge and how we collect and can use your information. We encourage you to read the Data Use Policy, and to use it to help you make informed decisions.

You own all of the information you disclose by choosing to speak aloud while as a Chattr participant, and you can control what is shared by choosing what you say. By speaking while participating in Chattr you grant us a non-exclusive, transferable, sub-licensable, royalty-free, worldwide license to use your words. We will let you connect to people everywhere by recording all sound from Chattr participants, transcribing the things you say, and posting the text of what you have said online in permanent digital public spaces. By speaking in Chattr it means that you are allowing everyone, including people beyond Chattr, to access and use that information. We always appreciate your feedback or other suggestions about Chattr, but you understand that we may use them without any obligation to compensate you for them (just as you have no obligation to offer them).

We do our best to keep Chattr safe, but we cannot guarantee it. We need your help to keep Chattr safe, which includes the following commitments by you:

- You will not bully, intimidate, or harass people while you are being recorded in Chattr.
- You will not utter: hate speech; incitement to violence; or discuss gratuitous violence.
- You will follow all applicable laws.
- You will not use Chattr to do anything unlawful or discriminatory.
- You will not use Chattr if you are under 13.
- You will not share your passwords or other people's personal information without their prior permission.

You may be wondering, 'What is Chattr?' or 'What do I need to know to help keep myself safe online?' Whether you're tech-savvy or still having trouble using a mouse and keyboard, we've compiled some tips for you. Chattr is a communications platform that brings you closer to the digital public space by recording the things you say and publishing them online. Remember that Chattr is an extended public space. Most of the communication taking place in the Chattr lounge is being made public online and viewable by everyone in the world. Since the conversations posted are public, some of this data may be made available or republished on other websites. Please keep in mind that conversations posted may be available in search or through third party sites. Ask questions about the things you might say while using Chattr like: Who are you sharing this information with? Can you trust all the people that will eventually see the information? How could your words be interpreted? Evaluate whether or not something is okay to say by remembering that if you wouldn't say it to a person's face, you shouldn't say while using Chattr either. The nature of the internet makes it difficult to completely erase content. What gets posted online can hurt feelings, affect offline relationships and even jeopardise future opportunities. We may delete user data if we determine is inconsistent with our expectations. We will not attempt to correct mistakes in transcription. Our service displays content that is not Chattr's. This content is the sole responsibility of the person who has said it. We may review content to determine whether it is illegal or violates our policies, and we may remove or refuse to display content that we reasonably believe violates our policies or the law. But that does not necessarily mean that we review content, so please don't assume that we do. We can issue a press release describing our relationship with your words. We do not guarantee that the Chattr lounge will be always free.

Unless we make a change for legal or administrative reasons, or to correct an inaccurate statement, we will provide you with seven (7) days notice (for example, by posting the change here) and an opportunity to comment on changes to this Policy. Your continued use of Chattr following changes to our terms constitutes your acceptance of our amended terms. You can stop using our Service at any time, although we'll be sorry to see you go. Any transcripts that have already been

published online will remain in the public domain indefinitely. If you violate the letter or spirit of this Policy, or otherwise create risk or possible legal exposure for us, we can stop providing all or part of the Chattr service to you. We will notify you immediately or at the next time you attempt to access the service.

Data Deletion Process

When handing the recording device back in, you can request that the recording be wiped and we will ensure this recording is not transcribed and all content on the recording device is removed. You can request deletion up until we publish your transcript. If a recording has already been published, we can delete tweets that refer to it, however once the transcription itself has been uploaded online, it cannot be deleted.

8.2 Open Planning

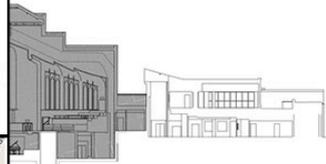
PLANNING APPLICATION

REF: 13L/0822



PROPOSAL

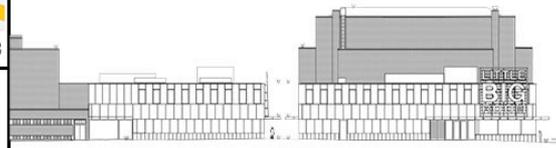
To demolish 1990's extension to rear of existing building and carry out redecoration, refurbishment and alteration works to the original building, including increasing the height of the third floor windows to the front elevation and the provision of new signage.



Existing

LOCATION

Philharmonic Hall
Hope Street
Liverpool
L1 9BP



Proposed

COMMENTS MUST BE RECEIVED BY

10/05/2013

DATE POSTED: 19/04/2013

HERITAGE

Grade II Listed
Designed for the
Royal Liverpool
Philharmonic
Society by the
distinguished
Liverpool architect Herbert J
Rowse and erected in 1936-39.



DESIGN

Refurbishment and improvement of the accommodation so as to maintain, attract and deliver an excellent and wide ranging programme of activities
Ensure that the Liverpool Philharmonic recognises, retains and grows its funding and donor base, and continues to attract investment at a local, regional and international level

SUSTAINABILITY

Ensure that the Liverpool Philharmonic recognises, retains and grows its funding and donor base, and continues to attract investment at a local, regional and international level.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam cursus. Morbi ut mi. Nullam enim leo, egestas id, condimentum at, laoreet mattis, massa. Sed eleifend nonummy diam. Praesent mauris ante, elementum et, bibendum at, posuere sit amet, nibh. Duis tincidunt lectus quis dui viverra vestibulum.

Suspendisse vulputate aliquam dui. Nulla elementum dui ut augue. Aliquam vehicula mi at mauris.

Maecenas placerat, nisl at consequat rhoncus, sem nunc gravida justo, quis eleifend arcu velit quis lacus.

Morbi magna magna, tincidunt a, mattis non, imperdiet vitae, tellus. Sed odio est, auctor ac, sollicitudin in,

Anonymous comments will not be taken into account so please state your name, address and postcode.



Town and Country Planning Act 1990

Planning (Listed Buildings and Conservation Areas) Act 1990

Town and Country Planning (Development Management Procedure) (England) Order 2010



**Liverpool
City Council**

Figure 40. Redesign of the planning notice for the Liverpool Philharmonic Hall

8.2.1 Notes:

The mockup of the lamp post sign was designed in conjunction with technology to track visitor behaviour. A proximity monitor (see Figure 41) was designed to be attached to the lamp post sign and to track passing visitor numbers and visitors that stopped to read the sign. This was intended to be used in collaboration with on-site interviews with the public to gauge reactions to the planning process but was not implemented due to concerns from the County Council during stage 1 of the project. Proximity output can be seen below in Figure 41 during testing of the device. The Y-axis represents the distance from the lamp post, while the X-axis displays the duration in seconds.

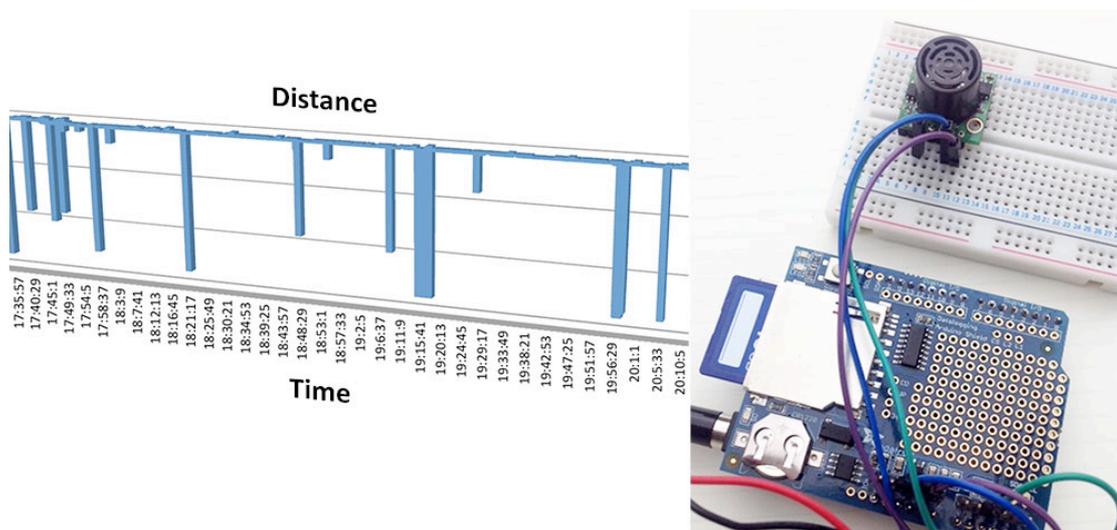


Figure 41. Data logger proximity data using a proximity sensor to detect distance from the lamp post.

8.3 Physical Playlist

Table 15. Future sharing with data in the bracelet

Future Sharing	Family	Friends	Colleagues	Doctor	Self
Music	12 (50%)	16 (66%)	1 (4%)		
Film	8 (33%)	12 (50%)	1 (4%)		
Text	9 (37%)	9 (38%)	5 (20%)		
Photos	14 (58%)	15 (63%)	4 (16%)		
Phone Contacts	5 (20%)	9 (38%)	7 (29%)		
Health Data	4 (16%)	0	1 (4%)	4 (16%)	1 (4%)
Other	4 (16%)	4 (16%)	4 (16%)		
TOTAL	56	65	23	4	1

Table 16. Present data sharing using SNS

Present sharing	Family	Friends	Colleagues
Facebook	8 (33%)	18 (75%)	2 (8%)
Instagram	3 (12%)	13 (54%)	1 (4%)
Twitter	4 (16%)	9 (38%)	5 (20%)
YouTube	4 (16%)	7 (29%)	2 (8%)
LinkedIn	1 (4%)	0	6 (25%)
Amazon	1 (4%)	2 (8%)	0
Pinterest	1 (4%)	1 (4%)	0
Dropbox	0	1 (4%)	0
Email	4 (16%)	4 (16%)	1 (4%)
Work VPN	0	0	1 (4%)
Yammer	0	0	1 (4%)
Tumblr	0	1 (4%)	0
TOTAL	26	56	19

8.4 TILO

TILO questionnaire

1. What is your age?

Under 16 16-18 18-24 25-34 35-44 45-64 65+

2. How often do you visit FACT?

___ times a year ___ times a month ___ times a week N/A

3. What is the purpose of your visit to FACT today?

Café Cinema Art gallery Other

4. Do you think the space is aware of your presence?

0 1 2 3 4 5 6

No, not at all Only to a limited degree Yes, mostly Yes, completely

5. Are you comfortable with cameras and screens gathering information about you?

0 1 2 3 4 5 6

No, not at all Only to a limited degree Yes, mostly Yes, completely

5. If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

0 1 2 3 4 5 6

No, not at all Only to a limited degree Yes, mostly Yes, completely

6. Do you use social media?

- | | |
|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> Facebook | <input type="checkbox"/> Twitter |
| <input type="checkbox"/> Twitter | <input type="checkbox"/> Flickr |
| <input type="checkbox"/> YouTube | <input type="checkbox"/> Amazon |
| <input type="checkbox"/> Google + | <input type="checkbox"/> LinkedIn |
| <input type="checkbox"/> None | <input type="checkbox"/> Other |

8. Do you have a supermarket loyalty card? Tesco, Nectar etc.

- Yes No

Figure 42 TILO visitor questionnaire

Table 17 Before TILO screens installed

DATE	Q1	Q2	Q4	Q5	Q6	Q7 SOCIAL MEDIA	Q8	INTERVIEW #
10/07/14	18-24	4y	3	6	6	Facebook, Twitter, YouTube, Google, Amazon	No	1
10/07/14	>65	1m	0	3	0	Facebook, Google +, Amazon, LinkedIn	Yes	2
10/07/14	>65	2m	0	2	2	None	Yes	3
10/07/14	16-18	3y	0	2	3	Facebook, Youtube, Amazon	Yes	
11/07/14	45-64	1y	0	6	2	YouTube, Google+, Amazon	No	5
11/07/14	45-64	1st time	2	4	4	Facebook, Twitter, Youtube, Google+, Amazon, LinkedIn	yes	6
11/07/14	45-64	2m	0	6	3	Facebook, Youtube, Twitter, LinkedIn	Yes	7
11/07/14	16-18	1w	2	4	6	Facebook, Twitter, Youtube, Amazon	No	8
11/07/14	25-34	1st time	0	2	0	Facebook, Twitter, Amazon	Yes	9
11/07/14	35-44	2m	0	0	0	Facebook, Youtube, Google+, Flickr, Amazon, LinkedIn	Yes	10
11/07/14	25-34	1w	0	2	4	None	Yes	11
11/07/14	25-34	3w	3	0	2	Facebook, Youtube	Yes	12
11/07/14	25-34	2m	2	0	0	None	No	13
12/07/14	18-24	1y	2	2	2	Facebook, Twitter, YouTube, Google+	No	14
12/07/14	35-44	1st time	6	6	6	YouTube, LinkedIn	Yes	15
12/07/14	16-18	3w	4	0	4	Facebook, Youtube, Google+, Flickr, Amazon, LinkedIn	No	16
12/07/14	25-34	2m	U	2	3	Facebook, Youtube, Amazon	No	17

12/07/14	35-44	2nd time	4	2	4	Facebook, LinkedIn	Yes	18
12/07/14	45-64	1st time	0	3	2	Other (instagram)	No	19
12/07/14	18-24	1m	2	0	0	Facebook, Twitter, LinkedIn	Yes	
12/07/14	>65	6y	U	5	0	None	Yes	21
12/07/14	25-34	1st time	4	2	0	Facebook, Amazon	No	
12/07/14	18-24	2w	2	2	3	Twitter, Amazon	No	23
12/07/14	<16	1st time	4	4	2	Facebook, Twitter, YouTube, Google, Instagram	No	24
12/07/14	18-24	2m	1	3	2	Facebook, Youtube, Amazon	Yes	25
12/07/14	45-64	1st time	0	0	0	Facebook, Twitter, Youtube, Google+, Amazon, LinkedIn	No	
13/07/14	45-64	1w	4	6	6	Facebook, Twitter, Flickr	Yes	27
13/07/14	25-34	1m	0	2	0	Facebook, Youtube, Amazon	No	28

Table 18 After TILO screens installed

DATE	Q1	Q2	Q4	Q5	Q6	Q7 SOCIAL MEDIA	Q8	INTERVIEW #
31/07/14	25-34	1st time	0	4	?	Facebook, Twitter, YouTube, Google, Amazon	Yes	W1
31/07/14	<16	1w	5	4	2	Facebook, Twitter, Youtube, Amazon	No	W2
31/07/14	45-64	1st time	0	0	0	Facebook, Youtube, LinkedIn, Amazon	Yes	W3
31/07/14	35-44	1st time	0	0	?	Facebook	No	W4
31/07/14	45-64	1st time	5	0	0	Facebook, Youtube, Google,	Yes	W5

Amazon									
31/07/14	45-64	1w	4	1	4	Youtube	No	W6	
31/07/14	16-18	2m	4	4	4	Facebook, Twitter, Youtube, Amazon	No		
31/07/14	16-18	2m	4	6	6	Facebook, Youtube, Google, Twitter, Amazon, LinkedIn	No		
31/07/14	16-18	2w	4	5	5	Facebook, Twitter, Youtube, Amazon	No		
31/07/14	16-18	2w	4	6	6	Facebook, Youtube	No		
01/08/14	<16	1st time	6	6	6	Facebook, Youtube, Google, Amazon	No		
01/08/14	45-64	2w	4	4	4	Amazon	Yes		
01/08/14	18-24	1st time	2	4	4	Facebook, Twitter, Youtube, Flickr, Amazon	No	W7	
01/08/14	45-64	1st time	1	5	1	None	No		
01/08/14	45-64	5w	?	2	0	Facebook, Twitter, Youtube, Amazon	No	W8	
01/08/14	<16	5m	3	6	6	Facebook, Twitter, Youtube, Google, Amazon	No	W9	
01/08/14	35-44	1m	4	6	2	Facebook, Youtube, Amazon, LinkedIn	No	W10	
01/08/14	45-64	2m	0	6	6	Youtube, Amazon	No	W11	
01/08/14	45-64	3y	1	0	2	Youtube, Google, Amazon	Yes		

01/08/14	25-34	.5y	0	6	4	Facebook, Amazon, LinkedIn	No	W12
01/08/14	25-34	1st time	2	5	3	Facebook, Twitter, Youtube, Flickr	Yes	
01/08/14	35-44	1m	4	2	2	None	No	
01/08/14	45-64	8y	4	4	3	Google, Amazon, Flickr,	Yes	
01-Aug	<16	2m	3	2	2	Facebook, Twitter, Youtube, Google, Instagram	No	
01/08/14	45-64	2y	4	2	0	Twitter, Youtube, Google, Amazon, LinkedIn	No	W13
02/08/14	16-18	10w	2	4	1	Twitter, Other	No	
02/08/14	25-34	1w	4	4	2	Facebook, Twitter, Youtube	Yes	
02/08/14	18-24	4w	0	6	2	Facebook, Twitter, Youtube, Google, Flickr, Amazon	Yes	W14
02/08/14	18-24	4w	0	6	4	Facebook, Twitter, Youtube, Google, Flickr, Amazon	No	
02/08/14	<16	1w	3	6	4	Facebook, Twitter, Youtube, Google	No	W15
02/08/14	18-24	1y	4	2	1	Facebook, Twitter, LinkedIn	Yes	W16

Interview data used within this thesis, transcriptions from audio-recorded interviews at FACT during the TILO project.

#2 (Recording DM670060)

Do you think the space is aware of your presence?

We've just been to see a wacky Swedish film, I'm not into all of that, I'm not into the space feeling our presence. Not at all.

Are you comfortable with cameras and screens gathering information about you?

For example if you are in the high street or in a building with cameras and screens are you comfortable with them recording you

Do you mean like security cameras? *Big brother!*

Do you think so?

Yeah!

How comfortable are you?

I think we are unaware of it, I think we are unaware of it happening, if people asked us we could choose what we would want to be involved in. I think it picks up what it needs to pick up on camera. I think its a good thing to be honest.

So you are moderately comfortable with it?

We are very confusing aren't we?

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

No, that's too invasive.

What if the screen could detect your gender.

We are a bit old fashioned in that way.

Do you use social media?

FB, Google, Amazon, LinkedIn.

Do you have a supermarket loyalty card?

Yes.

And are you aware that these services are capturing information about you

We can't do anything about it, so ok if we don't have a clubcard, just by the fact that having an email address means that you are part of a bigger thing really.

I think we are old enough to be aware of things going on in the background about everything but sometimes you are better off not knowing

When you are in a space like this you are saying that you are not happy,

I think it was the way you portrayed the question, it was as though somebody... were we happy to be in this space and to know there were people in this space was a bit spooky, it was more that someone was watching us, a little bit supernatural. When you said do you think this building knows you are here and is aware, you are talking about this actual building has some kind of (PAUSE) (*Intelligence?*) feelings about us, I don't believe that.

But when you are online, do you think the same thing is happening?

I don't think about it like that,

No?

I just think it is just technology, that's life, that's the way the world is going. I think it's the way you portrayed the question as if the walls here and the ceilings would know we were here. On another note, we've just been into St Lukes, the bombed out church, and were in awe there that has been standing for over 100 years, the walls are still standing, if only they could tell a tale.

Fact is fabulous, this is our favourite place, better than the odeon. The films and the space are really good. Quirky film but good.

#3 (Recording DM670062)

Do you think the space is aware of your presence?

The space is aware of my presence?

FACT as the building, in the same way you sense other things around you.

I enjoying coming here but I wouldn't necessarily say that the building senses my presence.

Are you comfortable with cameras and screens gathering information about you?

In the sense that buildings have cameras for security and screens to capture information about you...

As you say its all around us so you cant avoid it

So in terms of how comfortable you are?

Im slightly uneasy but you just have to accept this so I'd say about 2, (only to a limited degree)

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

I'm a member so they have got some of my personal information.

We are looking at this from the way the screens operate in the space and the information screens that FACT operates. If the screen was more intelligent in some way would you take a different route in the space to avoid the screen detecting your presence.

So maybe a 2, (only to a limited degree)

Do you use social media?

I don't, I used to use computers a lot but since I retired I don't.

Do you have a supermarket loyalty card?

Yes

#6 (Audio DM670069)

Do you think the space is aware of your presence?

I do now because you <laughs> because you approached me. But I'm not quiet sure.

Whether the building is sensing you in any way

Oh yes, when we put some more in there (money donation box) and we heard it

Are you comfortable with cameras and screens gathering information about you?

No I am not at all really, except I wouldnt want to be on camera knowingly to be watched, but if its just for survellience it doesn't bother me too much.

So you are not unhappy?

I'm quiet comfortable really, but if you wanted to film me for a programme I'd have to say no.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

For example if it could detect whether you are male or female

Or things I like?

I wouldn't be unhappy about that, I do think i would think 'oh I'm going to go in there because they are going to improve things for me' that wouldn't be a factor but I don't think I'd be too upset.

What if it could obtain information with just you walking into the space, And if it was assessing your height, gender...

No, no, I wouldn't mind

But if it was obtaining data from your mobile phone

I wouldn't want that to really happen.

So you would mostly engage with that process?

Yes

Do you use social media?

Facebook, Twitter, YouTube, Google, Amazon, LinkedIn

Do you have a supermarket loyalty card?

Yes

So they know everything I buy and they send me free vouchers.

so you are aware of what they are doing and you are sharing your data, you are sharing your personal information to benefit from that. You are happy with that.?

I have read 1984

Its whether you see that as a benefit?

Or a threat!

I'm not too worried, we are only here for a limited time aren't we.

You seem quiet comfortable with that, whereas some people may avoid these things, or are not aware that camera are in certain spaces and for what purpose.

What is your research about?

My research is about peoples perceived fears of sharing personal data.

Is there an age, because my husband is totally against it.

I don't think it is age related. Some people see sharing data as a benefit because they see the benefits of the trade.

People also feel more comfortable online as opposed to if that screen in the public space was gathering information about them.

Well usually you are in your own home or in your own space so you feel a bit more safe don't you.

#7 Audio DM670070

Do you think the space is aware of your presence?

The space, you mean the space itself, the physical building is inert.
Only the human beings in it are aware of my presence.

You don't think the building has any form of intelligence to sense you are here?

Only in the sense that an intelligence created it.

So that would be not at all then?

You would have to define your terms better.

I guess your first reaction to the question you were not convinced as you said the building was inert.

OK, then not at all.

Are you comfortable with cameras and screens gathering information about you?

For example CCTV, supermarkets, capturing your presence in that context.

I'm comfortable in the sense that's the world we live in.

I think there is a kind of larger issue around what happens with that information, the intent to its use.

There's a whole raft of issues about that.

I'm comfortable to walk around the world as it currently is.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

I might and I might not.

It would depend on what it demanded of me and whether...

So if it were obtaining information about you gender and height to say you might be interested in this film or this exhibition we are having.

As long as it doesn't fill up my inbox with spam I wouldn't really mind

It may be that it doesn't communication with you outside of this space.

That doesn't really bother me.

So if it were to obtain information from your mobile device that you carry around with you, for example it was accessing your phone as you walked into the space and could tell where you had travelled from that day, knew that you travelled from a particular region and could then start marketing to that area.

OK, I get it

It's a theoretical idea,

Yes its interesting. But im not sure ...

What I am hinting at is what is the tipping point between just your gender to accessing your phone record.

So a step further would be my social media and a whole another level of profiling.

And the tipping point where one might be OK and the other too much, where you think to go in that door rather than that door.

I think that's fine if I manage the information I put out at the other end.

For example I don't put out a lot of personal stuff out on Facebook.

I talk to people but there a list of things that you can tell Facebook where you have worked etc, I don't fill in any of those boxes as they have enough information with my name and date of birth.

There is no real advantage for me to give them that information, and that means they can't then do anything with it because they don't have it. If I'm aware of the

fact that something is gathering information on me, and I have control over what level that goes to that's fine.

So you are restricting the information you put out online knowing that when you are in a physical space it is not able to gather as much information.

Well it depends whether I care or not.

There are some things that I don't care whether everybody knows and there are some things that I do.

Everyone has different degrees of privacy.

It depends who you are with and where you are.

So if we are going to have this fluid information, constantly going on then you have got to kind of make it relevant to the context.

It starts to feel a bit exhausting.

Because the conversation has gone from one to another, It seems that you are perhaps somewhere in the middle?

Yes I'm very in the middle.

Do you use social media?

Social media: Facebook, twitter, YouTube, Boycotting amazon because of their tax avoidance, LinkedIn, Supermarket loyalty card – Sainsburys Nectar card.

Based on that you are sharing a lot of information, you are sharing this in the virtual spaces and making decisions about sharing information.

This is creating another series of points where you interact with the digital world because once you create information its there isn't it. So its another load of access points or terminals where you are plugging in to that.

So when you said you restrict the amount of information you put out on Facebook, do you do that with your photographs as well? Do you post photographs on FB?

I'm a photographer so I don't put a lot of my work on FB, occasionally I will, I put it on my own websites so that's how I manage that but there have been times where I have put a lot of my work out on FB in a very unstructured way because that what I felt like doing. There are a lot of issues around rights and use of photographs on the internet in general, its all a very complicated area to get into.

In general I think, I go and take a look at other peoples photographs to see what they have been up to, I don't post loads of stuff of my actual work, more personal for other members of my family or share things directly with other groups of friends.

#9 DM670072

Do you think the space is aware of your presence?

The space, do you mean the people working here?

No, the space itself, in the same way you are aware of other peoples presence do you think the building space is aware of you?

In the way that the doors open and close, the toilets may flush automatically, this is not necessarily intelligent.

Its not an impression I got, so not at all.

Are you comfortable with cameras and screens gathering information about you?

I'm not fussed about it, but I don't like to be able to see them.

I'm aware of CCTV cameras in the UK but I don't like it when I see them overlooking me.

So where do you position yourself on the scale?

Towards uncomfortable.

So only to a limited degree.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

So if the screen knew you had been sitting here for a while and offered you to purchase another cup of coffee.

No, I wouldn't like that at all.

I'm aware of adverts on bus stops in London where the bus stops interact with people walking along.

So you don't like that

No not at all

Part of my research is to look at that, to see if people are comfortable with that.

Do you use social media?

Facebook, twitter, YouTube, Amazon,

Do you have a supermarket loyalty card?

Yes

Based on the fact that you are sharing a lot of information online but you are not happy about screens in public spaces doing the same thing.

YEAH!

The loyalty card I caved recently having held out for years, I noticed that Sainsburys nectar card was sending my mum vouchers all the time.

So you saw the benefits there.

But I knew I was selling my data and they monitor what I buy. I try not to think about it too much.

Twitter I use through work so we have been encouraged to use it as we are a charity to promote what we are doing.

This is not your private account?

Its in my name but everything I tweet is to do with work and what the charity is doing, this is the limit to what I use it for, for networking and for work.

Facebook, is personal, I keep reviewing my privacy, I've tried having it so only friends can see. I use it share articles that I think are interesting but I do put photos on there.

Best bit of visiting today.

The coffee was good, but I like the light the space, the windows. The flowers around, sort of like being in a garden that I like.

#14 DM670077

Do you think the space is aware of your presence?

Umm, yes because we were served coffee, the girl upstairs said hello. The fella over there said hello.

That is the people within the space, do you think the building itself it aware?

Pause...

We can come back to this question.

Are you comfortable with cameras and screens gathering information about you?

On the street, supermarkets, CCTV?

Only to a limited degree, I don't like it too much.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

You are shaking your head.

I'd avoid it like the plague, I'd find that a bit sinister even if it were for altruist reasons.

So to what level are you uncomfortable?

Even though we know we are being recorded for this interview, we know its on the level you are doing it in person rather than being behind a screen. Its different. Its more covert, if it were behind a screen it would be more secretive and covert in nature. Maybe to a limited degree because talking to you, you are being open about it like this.

Do you use social media?

Facebook, twitter, YouTube, Google, Amazon.

Do you have a supermarket loyalty card?

No

Best bit of visiting FACT

It's a nice space, and you can have a coffee. Somewhere you can stay for a few hours.

Based on the fact that you have answered that you are already sharing a lot of your information online but you have suggested that you are uncomfortable with sharing in this space do you think there is any difference?

Im sure all of our data is being sold, daily.

I don't have a lot of information on Facebook.

Twitter is more open. I don't mind that because that is information that I put.

You have some control over it.

So based on this if I come back to question 4, do you think the space is aware of you presence.

Yeah, then probably but I wouldn't want to think I was paranoid walking into everywhere if everywhere was totally aware of you.

I do look sometime. The other day when I was in the gym I thought it was just me in there. And I thought I bet there is a camera in there. As soon as you start looking they are everywhere.

I don't want to make you feel paranoid. What we are doing is considering what people consider to be their private space online and what they consider to be public.

I wouldn't think it records everything that you say without you knowing? I would say I'm happy to a limited degree because its just visual.

So you are just thinking that its just visual, recording your image and not recording everything about you.

I don't mind them having my image. I don't mind so much being on camera. You wouldn't want them recording the conversation we just had in the café.

This raised interesting questions.

For example Tesco have been trialing camera in the screens are the tills..

Its like George Orwell isn't it.

These screens are customising adverts based on your information by doing a basic facial recognition and serving a advert when you get to the till. It's customising and they can they quickly change those adverts on demand. They are getting round the privacy issues by not storing the image, we are just going to scan you at the till.

You could argue that this is quiet invasive being scanned.

If you had self esteem issue it wouldn't be great.

You might want to go out with big cloaks on, or false faces.

The previous exhibition here showed an artist that had done that, designing masks to get around this. Camouflaging the face.

Or a kind of birka that would hide yourself.

#18 DM670081

Do you think the space is aware of your presence?

I don't understand.

Are you comfortable with cameras and screens gathering information about you?

At the beginning no, but now we are used to it.
They see me, I don't see them.

So you are happy with that?

No.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

If it is only FACT that is OK.

Do you use social media?

Facebook, LinkedIn.

Do you have a supermarket loyalty card?

Yes in Paris, I am ashamed to say yes.

All of these are gathering information about you, you are not comfortable with cameras on the street capturing information. Do you see any difference between the physical space and being online.

Half and half.

You said you were happy for FACT to gather information.

Because it is a cultural place for me and the goals are not the same.

#21 DM670083

Do you think the space is aware of your presence?

In the same way that you are aware of other people.

I think it is OK, I love the auditorium, I love the comfort of that.
I suppose so.

I don't like concrete, its a bit cold.
We come to silver screen, you get a cup of tea and a biscuit.
The welcome is nice.

Are you comfortable with cameras and screens gathering information about you?

I don't mind because you feel safe.
I'd say about 5 on the scale

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

Probably not. No.

Do you use social media?

I don't like any of that.

Why is that?

I don't like, I feel its too public and I like to be private.
I like to be more anonymous and I feel it is intrusive.

Do you have a supermarket loyalty card?

Yes I do, and I realise that's got all info, cos, that's exploiting you a bit.

Its probably doing the same as some of these others.

Except I didn't realise when I first got one. It suddenly dawned on me that they know a lot about me.

Is that because of when you get vouchers through the door?

Yes because all the personal things I choose are the things they have put down.
They are reading what I am buying.

I have thought about trashing it and not having it.

I feel contradictory, I don't mind the cameras because I feel safer when I am out and about but I don't like that sort of thing because that's my business. Its like when you go and buy something in say John Lewis and they ask you for your postcode, they know all about you from that.

#24 DM670085

Do you think the space is aware of your presence?

Do you think the space knows you are here in the building?
In the same way that you are aware of other people in this space, do you think the building knows you are here?

Yeah, yes mostly.

Are you comfortable with cameras and screens gathering information about you?

In the street, CCTV...

I'm comfortable with that.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

What do you mean by personal?

One could be that they could tell whether you are male or female and could give you better information.

Oh, I thought you meant that about information about your family and where you lived.

Maybe it could go further than that, and it could tell where you had travelled from, or access your facebook account.

Oh no. Only to a limited degree of it.

Do you use social media?

Facebook, Twitter, YouTube, Google

Do you have a supermarket loyalty card?

No.

You have said that you are not happy if it could access personal information but you are already putting a lot of personal information online.

It depends whether you have it private, you only accept people you want to know what you are putting up, do you know what I mean? So some people un-private and everyone can see their profiles.

So you are publishing to friends online.

Facebook are there watching anyway aren't they.

Are you aware that Facebook is gathering information about you? And maybe selling that information on.

I've got facebook but I rarely use it though, I've got instagram.

So what is the next big thing, do you think Facebook will disappear.

Instagram. Everyone uses instagram.

#25 DM670086

Do you think the space is aware of your presence?

Male: Um, the space itself. I guess not.

Female: I don't know because the things we have been to, they had one thing here that had a recognition thing and I think the space was aware that people were filling it.

Male: OK, 1. To a limited degree.

Female: it was a facial recognition thing that plotted your personality as you stood in front of it.

Are you comfortable with cameras and screens gathering information about you?

Outside of the gallery, CCTV, supermarkets.

M: I'm not overly comfortable

F: It depends what it is for.

M: its that kind of out of sight out of mind thing I guess as well.

F: and if you feel that you are in an area where you feel you know theres going to be security cameras its more about your protection and your safety as opposed to, yeah...

So where would you plot that?

Maybe a 3 or 4, 3 is in the middle, 4 is yes mostly comfortable.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

M: Not as much.

F: no, well it depends what better service I want, because if I came to see a gallery and to get involved in the gallery then possibly. Then sometimes you come and watch a film. I don't know.

Maybe 2 for me.

Do you use social media?

Facebook, YouTube, Amazon,

Do you have a supermarket loyalty card?

Yes, Tesco.

M/F: I know they gather a lot of information.

I am curious as you don't seem to be comfortable sharing your personal information in this environment but you are when you are online.

F: Its the anonymity isn't it sometimes of possibly being online, when you don't feel like, when you know you are

M: No, I'm always careful what I put online, but as long as its not overly intrusive it's the out of sight out of mind what I said before, and that occurs quiet a lot. For example if I'm getting information, I've entered online, like Amazon and then theres an advert for something Ive looked I think that's a bit weird. I'm not particularly enjoying that.

F: Its a bit odd.

M: But then in a sense its good, it might display something saying if like this and you might also like this. And in those instances I thought I might actually. And in other instances I'm like how does the computer know what I like.

F: I'm on the mailing list for FACT, so if they knew more about what I liked they could personalise it more.

M: We saw the last exhibition with Fag face, with facial recognition and distorted masks.

Best bits of FACT

M: I was a little disappointed, they normally do more with technology.

F: upstairs was quiet empty.

M: You had to really work to read everything.

M: what I like about FACT is that when it is quiet interactive.

So when things are more challenging?

M: I think if it doesn't grab your attention within the first 10 seconds then you kind of lose interest.

F: I think that's quiet true.

#28 DM670091

Do you think the space is aware of your presence?

How do you mean?

In the same way, you are aware of other peoples presence, do you think the building itself is aware of your presence?

No not at all.

Are you comfortable with cameras and screens gathering information about you?

Yes

Like CCTV on the street.

I feel uncomfortable about that. Say 2 only to a limited degree.

If the screens at FACT were able to obtain personal information about you to give you a better service, would you engage with it?

What if they could use camera and things to film reactions?

If I give you 2 examples:

It could determine your gender and age to give you more information about what was going on. Another example might be that we know who you are from your facebook account..

No! don't like it.

So we could customise your experience.

No. I like to come in as a person off the street and not for them to analyse me or anything like that. Just to come and watch.

You seem to have 2 reactions there, the first you were not too bothered about the first example.

It depends how far it is, its quiet intrusive isn't it.

So on that scale, id say no not at all.

I think you come in to look at the art and not to be looked at.

Do you use social media?

Facebook, Youtube, Amazon,

Do you have a supermarket loyalty card?

No, nothing.

Considering you are sharing some of your information online, you are not happy about this in the street or this space.

I don't share a lot online, its more just photos and things, it's a place...

So you don't think your photos are giving away information

Yeah I suppose they are but only with my online community, facebook friends.

Do you consider Facebook itself to be part of that community?

Because other people can see my stuff?

Facebook as an organisation may be using that information.

Yeah, I suppose it is weird.