

# Design

## Digital Worlds

**Designing the Digital Public Space**

**NAOMI JACOBS  
RACHEL COOPER**

# Living in Digital Worlds

*Living in Digital Worlds* investigates the relationship between human society and technology, as our private and particularly our public lives are increasingly undertaken in spaces that are inherently digital: digital public spaces.

The book unpicks why digital technology is such an inextricable part of modern society, first by examining the historical relationship between technological development and the early progression of human sociality. This is then followed by an examination of the ways in which modern life is currently being impacted by the expansion of digital information and devices into multiple aspects of our lives, including focuses on privacy, bias and ownership in digital spaces. Finally, it explores potential future developments and their implications, and proposes that it is crucial to consider the design of technology and systems in order to support a positive and beneficial direction of change.

Each chapter includes case studies, primarily drawn from The Creative Exchange, a five-year programme which ran from 2012 to 2016 to explore the notion of the digital public space through collaborative cross-sector research.

**Naomi Jacobs** is a Research Fellow whose various work focuses on interaction in digital and physical spaces. Previous topics of research by Dr Jacobs have included interdisciplinarity and knowledge exchange, fan practices of sharing online and the effect on communities of internet of things technologies.

**Rachel Cooper OBE** is Distinguished Professor of Design Management and Policy at Lancaster University. Professor Cooper's research covers: design thinking; design management; design policy, across all sectors of industry. She has a specific interest in design for wellbeing and socially responsible design, and has published widely on these topics.



# Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

# **Living in Digital Worlds**

## Designing the Digital Public Space

**Naomi Jacobs and Rachel Cooper**

First published 2018  
by Routledge  
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge  
711 Third Avenue, New York, NY 10017

*Routledge is an imprint of the Taylor & Francis Group, an informa business*

© 2018 Naomi Jacobs and Rachel Cooper

The right of Naomi Jacobs and Rachel Cooper to be identified as authors of this work has been asserted by them in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

*Trademark notice:* Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

*British Library Cataloguing-in-Publication Data*  
A catalogue record for this book is available from the British Library

*Library of Congress Cataloging-in-Publication Data*  
A catalog record for this book has been requested

ISBN: 978-1-4724-5283-2 (hbk)  
ISBN: 978-1-315-59278-7 (ebk)

Typeset in Times New Roman  
by Cenveo Publisher Services

# Contents

<i>List of figures and tables</i>	vii
<i>List of case studies</i>	ix
<i>Acknowledgements</i>	xi
<b>Introduction</b>	1
<b>SECTION 1</b>	
<b>How did we get here?</b>	3
1 Defining the digital public space	5
2 Digital public space for the evolved mind	28
<b>SECTION 2</b>	
<b>What are the attributes and effects of digital public space?</b>	51
3 The physicality of digital public space	53
4 Inhabiting digital information space	81
<b>SECTION 3</b>	
<b>What are the consequences of digital public space?</b>	113
5 Transactions, payment and ownership	115
6 Challenges of the digital public space: privacy and security	140
7 Challenges of the digital public space: bias	165

**SECTION 4**

**How do we design digital futures?** 185

8 Futures of digital public space 187

9 Design processes and management in digital public space 219

*References* 242

*Index* 259

# Figures and tables

## Figures

1.1	Hope poster	16
1.2	Nope poster	16
2.1	Visual illusion	42
3.1	Summary of common traits found in virtual worlds during three generations of history	56
3.2	Barcode	69
3.3	QR code	69
3.4	RFID tag	69
5.1	The Physical Playlist	124
5.2	Example of a Creative Commons licence	126
6.1	RFID embedded object (Oyster card)	146
6.2	Blood data visualisation project	148
6.3	The Wildermann	148
7.1	The ‘size of Africa’	166
7.2	The Gall-Peters projection	167
7.3	The Discovery Engine website at TWAM	172
7.4	MPs debate what?	173
7.5	Open Planning signage	181
9.1	Design Against Crime model	233
9.2	The Double Diamond	237
9.3	The Design Experience model	238
9.4	A new process for designing digital public space	239

## Tables

1.1	World internet usage and population statistics, November 15, 2015	19
2.1	Stages in the history of human evolution	32
2.2	Stages in the history of human evolution: orders of intentionality	33
2.3	Stages in the history of human evolution: hypothesised group interaction	38



# Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

# Case studies

1.1	The Creative Exchange and the many definitions of digital public space(s)	12
2.1	Northpaw	44
3.1	Awakening	65
4.1	Digital mementos	89
5.1	The Physical Playlist	122
5.2	Collaborative creation	129
6.1	Blood data visualisation and use of patient data	148
6.2	Computer vision invisibility	159
7.1	Past paths	171
7.2	Open planning	180
8.1	Alicia	192
8.2	Vera	198
8.3	Phil	204
8.4	Alison	207
8.5	Joseph	212



# Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

# Acknowledgements

We would like to thank all of our colleagues and expert advisors who worked with us on the AHRC Creative Exchange Hub Project between 2012 and 2016. Their insight, energy, and contribution to issues around the digital public space inspired and informed the text. We would of course like to thank our funders the Arts and Humanities Research Council without whose funding we would not have been able to lead and engage with the research undertaken by our 21 doctoral students and their supervisors.

We would also like to thank those who have kept us company in various digital public spaces inhabited over the years, particularly the Agincourt Agitators for punctuation advice, and being interested. Finally, to Ruth Templeton for helping us deliver!



# Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

# Introduction

Digital is a term which is over-used, abused and in some senses becoming meaningless. Digital is everywhere and nowhere, indistinguishable from other aspects of the material world and the way we live in it – at least for most people in modern developed societies.

This book results from a five-year research programme called The Creative Exchange (CX), which focused its attention on the ‘digital public space’. Initially this was defined as:

Where anyone, anywhere, anytime can access, explore and create with digital content.

The concept of digital public space was originally developed by the BBC and taken up as a topic for investigation by the Creative Exchange, particularly with regard to the relationship of the creative industries to academic research. However this book will explore more closely the origins and aspects of how we can talk about digital public space, and also focus on broader interpretations and implications.

Our work takes a particular lens to this question, drawing on the authors’ background and focus. It does not claim to be taking an exhaustive or privileged position, but complements other work on digital public space produced during the Creative Exchange research process, which includes the theses of 21 students whose doctoral work took place during the project.

Because digital technology is becoming ubiquitous, and is now an integral part of all of our lives, we need to understand it. However the systems are so complex that it is becoming more and more difficult to fully grasp all aspects and the impacts they can have on our lives and our possible futures. For this reason, we want to return initially to the basics of what we mean by digital public space, and how humans have developed in terms of their interactions with each other and the world. This is followed by an analysis of the physical attributes and effects, and the intangible non-physical attributes and effects of this concept of digital public space. It is clear from considering these dimensions of digital public space that there are numerous consequences which we must understand. An understanding of this context will enable us to think more carefully about our future in the digital public space and how we design and create within it. We have therefore structured the book to lead us through this journey.

## *Section 1: How did we get here?*

- Chapter 1: We examine the history of the digital public space as a concept, unpick the definition, and explore what and who is encompassed (and is not) by the term.
- Chapter 2: We give a brief overview of the evolutionary history of human culture and cognition, and relate this to the concept of ‘technological revolutions’; points beyond

## 2 Introduction

which a particular innovation is irrevocably bound to the way we live our lives so that it cannot be removed without major societal collapse.

### ***Section 2: What are the attributes and effects of digital public space?***

- Chapter 3: We explore the ways in which physicality has affected the development of digital public spaces. This includes: virtual spaces which are built on templates in the physical world, telepresence allowing physical embodiment at a distance, hybrid digital/physical interfaces and spaces, and how pervasive computing might enhance our physical environment.
- Chapter 4: We propose that a key part of the digital public space is the *information space* that pervades our modern connected lives. This affects our cognitive processes, society and interactions, and conception of ourselves as individuals.

### ***Section 3: What are the consequences of digital public space?***

This section looks at specific contexts in which digital public spaces affect behaviour and interaction, and at the challenges posed by the integration of these technologies into our societies. Trust is a critical aspect in each of these challenge areas.

- Chapter 5: We discuss aspects of ownership and transaction, and new forms which are being developed for digital public space.
- Chapter 6: We consider privacy and security in the digital public space, what the differences between these are, and how it might be impacting on our wellbeing and interactions.
- Chapter 7: We discuss different forms of bias that can affect the digitally connected world.

### ***Section 4: How do we design digital futures?***

- Chapter 8: We look forward to futures of digital public spaces, emphasising that we do not aim to predict, but rather speculate and ask what would be the consequences of possible endpoints of current technology trends, and how this might impact on design decisions.
- Chapter 9: Our final chapter foregrounds design principles and processes, focusing on why these are important when developing new technologies and systems in digital public spaces. We highlight digital public spaces as emergent systems, and the importance of the user in considerations of design.

It is clear that this topic is fast-moving and dynamic. We realise that we are writing at a particular moment in time and referencing contemporary technologies and thinking that might rapidly change. However, we think it is important to understand the opportunities and challenges for design and designers that are arising from and being signalled by the consequences of these technologies.

## **Section 1**

# **How did we get here?**



# Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

# 1 Defining the digital public space

Today our world is made up of colliding parallel dimensions; the digital world is as ubiquitous as our physical world, and there is space in both worlds that we navigate and inhabit. This chapter discusses the origin of the term ‘digital public space’, how it is evolving in general practice and application, and how it might relate to these parallel worlds.

## **The Digital Public Space (DPS) project: BBC origins**

The phrase ‘digital public space’ is becoming more widely known. There are however a variety of different ways in which it can be used and interpreted. As with any new term, there are divergent ideas of what it means. Therefore, before it can be explored in any great detail we must look at definitions of digital public space, and where the term originated.

Although a few isolated instances of the phrase can be found earlier, the first real use of the term comes from work by the BBC, announced in 2011. Earlier uses are mostly in the context either of use of the digital in cities (Frenchman & Rojas, 2006; Graham & Aurigi, 1997) or curated online spaces for the public to use (Hinssen, 1995). From May 2012 until March 2013, the BBC ran an initiative called ‘The Space’. Extended from an initial six-month pop-up service, this experimented with the idea of making the corporation’s extensive archives shareable, both within the BBC and with external organisations which might be able to make use of them. The Space was described as a service which ‘knits together BBC technology expertise and content from the corporation, BFI and UK arts bodies with £3.5m in Arts Council commissioning funding’ (Kiss, 2013). Its strapline was ‘the arts – live, free and on demand’.

Interaction was a key part of this early venture, as explained by Alan Davey<sup>1</sup>, Chief Executive of Arts Council England: ‘What’s really exciting about The Space is that it will provide a communal playground for arts and cultural organisations, for technology wizards, and for audiences – anyone who’s open to new ways to connect with culture – to come in, to be creative, and to feed back about their experience.’

Key players in the development of this project were Tony Ageh (Controller of Archive Development) and Bill Thompson (the archive’s Head of Partnership Development). Following on from The Space, they led the DPS project which centred on a shared technical platform for indexing, searching and publishing material in partnership with other UK cultural organisations.

An article in JISC Inform<sup>2</sup> in 2013 sets out the following principles:

- Long-term sustainability of the material – it needs to be future-proofed against formats becoming obsolete.

## 6 *How did we get here?*

- Detailed metadata needs to be available for every object.
- Freedom of access and use in education and research.
- Open technical standards.
- Trustworthy management of user data.

Arguably the most critical of these is the one which refers to metadata being available for every object. It is disingenuous to think of the DPS project as simply making the BBC's previously broadcast programmes available online. As Brody and Fass describe it:

The Digital Public Space (the DPS) originally began life as a way of thinking about how the BBC archive could be made available and accessible to all. This was swiftly followed by the realisation that surrounding the BBC content was a huge seam of additional data and a new context for digitally mediated cultural experiences.

(Brody & Fass, 2013)

The archive is not just the programmes which have been commissioned, but every bit of information that was recorded and stored which surrounds those programmes. This might contain content including but not limited to scripts, soundtracks, contracts, unused footage and concurrent news. It is the surrounding content and links to other BBC materials and holdings that makes the possibilities of this connectivity so enthralling. This is made possible due to metadata: information about an item that allows it to be placed in a context. For example, traditional cataloguing information, such as the Dewey decimal system or ISBN numbers, allows books to be identified and placed within categories. If you go to the shelf to look for a particular book and the books have been shelved with others which fit in that category, you may find another relevant book which you did not previously realise existed. Metadata for digital content can be even more important, because you cannot easily 'browse the shelves' of the huge amounts of available information; information which may also be in many various forms and stored in different media. The connections between items are often going to be automatically extracted. This therefore requires correct categorisation and labelling, allowing links to be drawn between connected items, whether they are connected because they are created by the same artist, or have the same historical building or event as their subject.

Members of the DPS project hope that by creating a consistent system by which their collection is stored and catalogued, this can be extended out and linked with other similar systems. To this end, the working group led by the BBC includes partners such as the BFI, British Museum, Tate, the British Library, and many others. By pooling collective resources and strengthening the power of the way they are indexed, a truly comprehensive public archival service can be imagined. As Tony Ageh puts it: 'The Digital Public Space is not a product or a service, but an arrangement of shared technologies, standards and processes that will be collaboratively developed and commonly applied, to deliver a set of principles, objectives and purposes against which collective enterprise can be evaluated' (Ageh, 2013).

More recently, in a speech at Royal Holloway University in 2015, he described his vision of the DPS as 'a secure and universally accessible public sphere through which every person, regardless of age, income, ability or disability, can gain access to an ever growing library of permanently available media and data held on behalf of the public by our enduring institutions'. These principles can be seen to be extremely aligned with the aims of the wider BBC. In 2006, Bill Moggridge wrote:

A policy goal of the BBC is to help people become engaged in the digital world, so they want to build engaging services for people who are not used to the Internet, or to any other digital media. For the design of the BBCi homepage, that means trying to make it really intuitive to explore the site, making sure that people have the opportunity to find out what they want easily. It also means helping them engage in dialogue by offering a simple way to comment on something they've seen, or send an email. Live chats and message boards are offered and connected with the BBC programs, so there is more two-way traffic.

(Moggridge, 2006)

This focus on audience engagement and interaction indicates that the BBC is interested not just in allowing people to access fixed content, but to create additional content of their own and contribute to the body of information.

The digital public space in this context therefore, appears to particularly pertain to open archives whereby existing data, metadata and digital objects can be shared in a meaningful way with and amongst the public. This worthy initiative is one that cultural institutions around the world are more and more seeing as a priority. Examples of this include the Tate's 'Insight' project<sup>3</sup> to digitise their collection, which has been running since 1998, and digitisation projects at many national collections including the Wellcome Library<sup>4</sup> and Trinity College Cambridge.<sup>5</sup>

Larger international initiatives such as Google's Cultural Institute, and Europeana, act not directly as stores for the digital artefacts themselves, but as curated spaces where archives from many different sources can be connected and displayed. In this way, they can be searched and linked more easily, by encouraging the use of metadata as described above. Clearly, we are moving more and more towards our cultural heritage not just being transferred to a digital form, but stored in such a way that it can be easily navigated.

### **The broader definition of digital public space**

The BBC's digital public space is clearly an exciting concept, but the term is too useful to leave in this specific context. More and more content and information is being made available online, and put in an associated framework where related strands can be brought together at the request of the user. But this is not limited to traditional 'objects' that may have been stored in a library, archive or museum. The ease of information transfer means that new information is constantly being created and shared. This may take the form of commentary, mashups, blogs or other new content created in a purely digital space by users as a form of expression. Increasingly it may also be information that previously would have been temporarily exchanged by individuals before vanishing, but is now retained in the online space forever – such as conversation and memories shared via social media platforms.

The objective of the BBC's DPS project is about giving people access to digital content. Taking this a step further, the facility to access and manipulate is allowing people to *interact* with digital content. We often use metaphors of place and space when we 'visit a website' or 'retrieve a file'. This may not purely be a habit of expression, but might be more fundamentally representative of the way that we manipulate information mentally, and indicative of something critical to the way people naturally interact online.

Ageh (2015) talks about the digital public space as a location, but then discusses mainly objects which exist within the space (metadata, archive material, created objects) without considering in detail the nature of the space in which these objects are located. There are

various ways of considering digital public space – as a collection or archive, a single object made up of a collection, or alternatively as the vessel in which this collection is located. It is important to clearly define how digital public space will be used as a phrase going forward in this book, because there does not so far appear to be a clear consensus for this as a concept and so avoiding confusion with any other definition is paramount.

To start off with, let us look at each of the words individually. Each of the three words ‘digital’ ‘public’ and ‘space’ are ones we use regularly, but put together there are a variety of meanings, all of which have a great potential for exploration.

### ***Digital***

Although digital is a word used widely, from policy makers to equipment manufacturers, it is actually quite non-specific. Going back to the very precise definition, ‘digital’ describes information which is measured in discrete units, such as binary (on/off) states. Only values corresponding to one of these can be measured. The word comes from the Latin ‘digitalis’ which means finger – when you are counting on your fingers you can only use whole numbers. You cannot count to 4.6 using your fingers, only four or five. By contrast, an analogue scale or measure is smooth and gradated, and measurements can be taken at any point. An example of this would be a child who stands against a wall and makes a pencil mark once a month to measure their height.

However, these days when people use the word digital they are usually referring to the use of computers or other higher technology. Computers are by their nature digital, because they transpose information into a form that can be understood by a machine – using 1s and 0s of binary code. An image displayed on a computer screen has been translated into series of points, or pixels, which are either on or off. But because the use of computers is so pervasive in our daily lives, using the word ‘digital’ is becoming less and less specific. Phrases like ‘digital economy’, ‘digital strategy’ or ‘digital experience’ are trying to convey a much broader category of new technologies which cannot be identified simply as ‘using computers’, and so it becomes very difficult to pin down exactly what is meant by them.

When talking about digital public space, the term is going to be used to distinguish from non-digital public space, meaning that which exists free of high technological influence. Though as we will see, that does not exclude physical spaces. ‘Digital’ is a place characterised by the underlying principle of translating everything to 1s and 0s for storage, analysis, reuse and requisition. This brings with it implications of transferability and persistence: digital information is easy to copy, transmit and manipulate and this brings many implications for its use.

### ***Public***

‘The general public’ is a phrase that is used to mean, basically, everyone. It might seem that ‘public space’ then is something which has an obvious common sense meaning, as being available for usage by all. We might think about public toilets, or public gardens. This equates to the notion of the ‘commons’ or commonly held resources.

But dig a little deeper and it is a complex social construct. Public bodies are those which are funded, usually via tax, by the population of a nation to provide services for all. Part of this social contract is the understanding that those who have more resources available can contribute on behalf of those who might not be able to afford it. In that way, a society can make critical services available for everyone. Jill Cousins of Europeana, talking about the digital

commons, describes the foundation of the concept of the commons as follows: ‘Underpinning the foundation of the commons is a set of resources in the public domain that are owned collectively or ‘held in common’ and shared openly among a community. The key feature is that, unlike private property, the ownership of resources held in common is inherently inclusive’ (Cousins, 2012). For this to exist in terms of the digital realm, there needs to be a public social agreement in place to establish these ‘common resources’ as described above.

When talking about a digital version of this public space then, we are assuming that there is some overarching body which governs digital content. This is not the case – it is made up of a network of private computers which, although publically accessible, are owned. James Bridle sums it up as follows: ‘Digital space is always owned in some way: there is no true commons online’ (Bridle, 2012). Projects such as Europeana and DPS are attempting to construct this shared public openness by creating a common system of shared metadata. These are funded by the public. But the Google Cultural Institute has similar aims, and is a private company. The lines become blurred.

Perhaps rather than looking at questions of ownership, we should look at accessibility. When considering how one uploads information to the internet, a consideration is often whether something should be ‘public’ or ‘private’. Public in this sense does not relate to the notion of publically owned, but rather publically available. If it is available for anybody to view, then it is in public in the same way that public behaviour refers to that which can be viewed by unrelated strangers who happen to be passing. The smoking ban in England is generally considered to be a ban on smoking in ‘public places’ (one is allowed to smoke in a private home) but includes owned spaces such as restaurants, hotels and workplaces. The difference is that individuals can freely enter and exit these spaces, although the proprietor usually retains the right to exclude particular individuals should they wish, and could in theory withdraw the entire service without notice.

The key aspect here is control. Control of access to a space or object determines whether it is private or public. As an example, a continuum can exist in the object of a book; from a notebook which an individual does not let anybody else access (private) to a copy of a novel which they own but lend out to friends (private, but more widely shared) to a copy of the same novel on a shelf in a cafe which can be borrowed by anyone who wishes to read it (public). The defining feature is who has access to the book. Similarly with spaces – in a private house, the only people who have access are the inhabitants with keys, and invited guests. A private party may have a large attendance list, but only those who are on the guest list may come in. This is still private even though there may be a large number of people there. A public telephone box can only be used by one person at any time, but can be used by anyone and is therefore public. Corey Doctorow, science fiction author, activist, journalist and blogger, states it thusly in an article about how young people deal with privacy in the digital age: “‘Privacy’ doesn’t mean that no one in the world knows about your business. It means that you get to choose who knows about your business’ (Doctorow, 2014).

Another factor which influences how ‘public’ or ‘private’ something is generally considered, is cultural context. For example, although a public picnic area in a park can be used by anybody, there may be delineated ‘private’ areas defined by how it is being used. If I come and spread my picnic blanket in one corner of a large park, it would seem unusual for another member of the public to set up their picnic two feet away from me when a much larger empty space is available. By laying open claim to a piece of ‘public’ space, I have indicated that using the area in direct proximity is invading my privacy. Of course, this area adjacent to ‘mine’ becomes public again if the park is very busy (say, because of a music festival) and the amount of available space is reduced. In that instance, a far smaller space becomes

defined as ‘mine’ and unavailable for others to make use of. This is a shared created context – the construction of spaces that have particular rules. The behaviour appropriate to these spaces may vary as well. danah boyd<sup>6</sup> (2007) gives the example of a beach versus a lecture theatre. Both of these are considered to be public, but you would only wear a bathing suit, wear sun-cream and stretch out on a towel in one of them. Social contract determines usage. We create similar context and spaces virtually. boyd talks about mediated publics which must necessarily be accessed using technology. In these situations the context and the level of privacy can be complex.

If a private space is one which has been created or claimed by an individual or group for a specific purpose and usage, either through actual restrictions or social understanding, a digital example of this might be a private Facebook group. This is an interesting layering of public and private. Facebook is a private company, and ‘owns’ the space in which all interactions on Facebook are made. However, the infrastructure is perceived as a ‘public’ space, which can be visited and contributed to by anyone. By restricting access to specific parts of this area, the users create a private space that curates their own constructed audience and context. Within this space, they may feel safe from those they do not wish to be visible to – although ‘ownership’ of this space could be revoked by the true owners (Facebook) at any time. Issues can arise if the perceived audience is not the same as the actual audience, and content can spread in an unintended manner. This, says boyd, is why participants in these public social online spaces may not be as safe as they think they are. Users may make the assumption that their privacy is protected by ‘security through obscurity’; that the sheer weight of information means nobody will find the ‘uninteresting’ thing they are saying. She points out that ‘this puts all oppressed and controlled populations (including teenagers) at risk because it just takes one motivated explorer to track down even the most obscure networked public presence’ (boyd, 2007).

boyd further notes four key features which she says define networked publics that are mediated by technology: persistence, searchability, replicability and invisible audiences. The first three of these criteria can be thought of as applying to ‘items of information’. Persistent items are or can be stored indefinitely, as opposed to a fleeting conversation offline. Searchable items are indexed and can be retrieved using applicable search terms, or discovered by following threads of data. Replicability is the phenomenon that (arguably) perfect copies can be created of digital objects. The fourth point, invisible audiences, is a consequence of the first three. Because these records persist, and can be copied and shared, then one must be aware at their creation that the potential audience is infinite.

While the features above are given in the context of online social spaces, this private/public dichotomy can also apply to digital objects. Locking items to make them private is usually implemented by making them encrypted (therefore requiring some kind of password or authentication to access). At the other end of the scale are objects which are fully indexable, that have been categorised and can be easily found via standard search tools. These may have been augmented with characteristics that make them well suited to being shared and can be easily linked, duplicated and transmitted. This is often encouraged in online social media tools which allow mechanisms for sharing such as retweets and ‘likes’. Objects may be created with the use of these tools in mind and could be described as being ‘social’, but if something is not intended to be used in this way, the issue of replicability may have implications for copyright and ownership.

One final aspect of public space we must consider is the power of democratic freedom that the populace has to speak and be heard. This encompasses both the network of communicating points of view, and the process of information filtering, structure and synthesis ‘in such a

way they coalesce into bundles of topically specified public opinions’; described in this way by Habermas (1996) who calls it the public *sphere*. A key feature of modern digital communication is that broadcast media is no longer pre-eminent: everyone has the capability to write a blog post or build a website and put their voice in the public sphere so it can be heard by all. One possible effect of this, according to Yochai Benkler, is an increase in individual autonomy. ‘This gives individuals a significantly greater role in authoring their own lives, by enabling them to perceive a broader range of possibilities, and by providing them a richer baseline against which to measure the choices they in fact make’ (Benkler, 2006). This might be because information can be spread and multiplied with less possibility of control by authoritarian regimes, or simply an increased opportunity to contribute to debate and be a part of the public conversation. Our ability to communicate any aspects of our lives to a wide potential audience, in a way that was not previously possible, means that some things we might have previously considered private now become the domain of the public. This will be explored further in Chapter 6. Concerns of information flow, such as fragmentation and polarisation of discourse, digital divides, authoritarian censorship and the obscuring effects of information overload, may result in an ineffective public sphere despite the use of such technology. But the nature of public discourse is something that is important to consider in discussions of digital public space.

It is difficult to draw clear lines around what is public and what is private in digital space. In this book we will take the broadest meaning of public, that an object or space is public if anyone, anywhere *could* access and use it. The fact that any individual has an equal potential use and access does not however mean that every person does use it, or will.

### *Space*

Above we suggested that digital public space could mean a collection or archive, an object made up of a collection, or the vessel in which this collection is located. To us, the use of the word ‘space’ implies thinking in terms of this latter. However if we are thinking about a space in this sense, it begs questions of what kind of objects sit within it, and also whether there are other ways that the space can be used. Can things other than objects exist there? Is there a map? How do we navigate within it? This may also not be a purely metaphorical construct. It is a conceptual space, but one which can be accessed and visited in a real sense. We may speak of it in terms of spatial correlates, even though these may not relate to the four dimensions (three of space and one of time) which we are used to considering. The spatial implications of non-physical environments are discussed further in Chapters 4 and 9.

Literal digital analogues to space have been tried, including virtual worlds modelled on physical spaces such as *Second Life* and those of ‘MMORPG’ multi-user games such as *World of Warcraft*. The use of virtual reality to go to an ‘alternate’ space that is traversed in the same way as physical space is one that has been explored by many speculative fiction writers, particularly in the genre of cyberpunk. The word ‘cyberspace’ was coined by William Gibson in his seminal novel *Neuromancer* (1984) which was one of the original works in this genre. In that novel, as well as *Snow Crash* by Neal Stephenson (1992), the characters plug into headsets which allows them to access a shared digital world which is experienced as if it were physical, and where transactions can be carried out and people can meet and socialise. These books predated the general use of actual shared virtual worlds by several years. But such virtual worlds do not seem to have taken off in the wider sense, and are used by a relatively small subset mostly for entertainment purposes.

Rather than asking us to enter a digital realm modelled on the real one, digital interactions have started invading the physical space. A key example of this is ‘backchannels’ which are enabled by mobile wireless and smartphones as well as other mechanisms. By giving people portable access to online connectivity, it allows the sharing of information between people who are collocated in physical space, or participating in the same activity. As predicted by McCarthy and boyd in 2005, the majority of academic and industry conferences these days will provide participants with a hashtag which can be used on social media services such as Twitter and Facebook. This collects all communication regarding the event as a single resource which can be viewed and searched by other participants. In this way, commentary and feedback about the event can be made in real time, allowing a secondary conversation to emerge alongside that in the ‘real’ world and as part of the linear discourse of the presenters. This also occurs for large shared events such as sports, for example the Olympics, broadcasts of particular television programmes or during national disasters such as hurricanes. Co-ordinating online messages in a searchable way means that anyone can join the conversation by ‘eavesdropping’ on the public statements that are made, and physical space collapses as people across vast distances share experiences.

We also have digital infiltration of the space that we inhabit in the form of information screens that pervade our daily lives. We no longer pay attention to screens unless we want something from them; they have become a ‘pull’ technology. Cities are full of digital content: from advertisement hoardings, to bus and train timetables, to live traffic updates. Some of this is not directly obvious to those walking down a street but may be integral to the way the city functions (such as algorithmically controlled traffic lights), or sustain digital behaviour in those who know it is there (such as widespread wireless or mobile data coverage accessed by those using mobile devices).

Augmented reality proposes that by using devices almost as ‘magic windows’, you can view the digital overlay on the real world. This technology was proposed as being game changing, has been slower to take off than predicted, only recently beginning to break out beyond rather specific implementations. Perhaps it will take technologies which directly include these in users’ field of view (such as Google Glass or ‘smart contact lenses’) to bring such things into the mainstream. But this should not obscure the fact that we are already living in a hybrid space that has digital information woven through it, and that it is a ‘space’ with more than the three usual spatial dimensions. The digital public space gives us a term which can be used to describe this new realm of information that is held in media other than the traditional minds, books or physical objects. This then, is the digital public space that we will talk about in this book and explore in more depth.

### **Case study 1.1: The Creative Exchange and the many definitions of digital public space(s)**

Throughout this book, we will highlight a series of case studies describing novel research exploring some of the issues particularly relevant to digital public space, its impacts, implications, and potential. The majority of these have been the result of work conducted as part of the Creative Exchange project, a collaboration between Lancaster

University, Newcastle University and the Royal College of Art; one of the UK Arts and Humanities Research Council's four 'Knowledge Exchange Hubs'.

The four hubs, spread across the UK, were set up in 2012 with the aim of furthering connections between creative industries, and arts and humanities academics. The Creative Exchange focused specifically on the topic of digital public space as a rich area in which to develop new collaborative work, inspired in part by the work of the BBC, Tony Ageh and Bill Thompson in examining the future of digital archives of public content.

At the heart of the knowledge exchange methods used by the project was a cohort of 21 PhD students, who were recruited from interdisciplinary backgrounds to undertake a new form of practice-based PhD around the theme of digital public space. An initial scoping exercise involved guided interviews with a range of creative industry contacts and academics with an interest in the area, and identified six key cluster topics within digital public space which were either areas of current research and work, or opportunities for development. These were:

- Public Service Innovation and Democracy
- Making the Digital Physical
- Performance, Liveness and Participation
- Stories, Archives and Living Heritage
- Rethinking Working Life
- Building Social Communities: Dynamic Structures for Growth

A 'Creative Exchange Lab' workshop event was held for each of these topics, with a range of academic, industry and third sector partners invited to join the Creative Exchange team and the PhD researchers to add their expertise and develop collaborative projects in these topic areas. Collaborative teams then worked on these projects to investigate issues relating to digital public space and develop products or services within the sector. Over fifty projects were carried out, which were extremely wide ranging as can be seen both from some of the examples used throughout this book, and others which are not included here: from best practice guidelines for 'good procurement' in the digital sector, through digital capturing and sonification of craft practices such as crochet, to a hybrid digital-physical co-working space.

The PhD researchers built their research theses around the research carried out during these projects, and some in the second phase of the Creative Exchange initiated their own digital public space related projects in conjunction with academics and industry partners. Through the research they produced, many different aspects of digital public space and digital public spaces were investigated.

The work of the Creative Exchange has not resulted in a single definition of digital public space: in fact, it has expanded it beyond existing definitions and exposed the plurality of concepts that are associated with these new technologies in our public spaces. Rather than answering a question, the projects which have taken place across the work of the Hub have begun asking new ones that in turn might expose the changes that are taking place in our cultural lives and how we might use design to address and shape these in a way that is socially responsible.

## **What exists in the digital public space?**

The Internet, then, forms an unstable digital field, a potential space between the archive and the encyclopedia, which we have termed the encyclomedia.

(Featherstone, 2009)

As we have discussed earlier in this chapter, a large part of what people immediately start to think of when discussing the digital public space is archives. Archives are generally thought of as being collections from which items (documents or objects) can be retrieved: an accumulation of primary sources; a ‘repository of the national memory’ (Featherstone, 2000). The critical difference between digital archives and physical archives is that because of computational processing power, it is much easier to find and retrieve objects quickly from a much larger stock. Even with a complicated indexing system, it would take a while to find the correct book you wanted from a library of ten thousand books, walk to the correct place in the stacks and retrieve it. Yet in a library of digital books you can almost instantly find out how many books use a particular word and then have them immediately available for you to read. Another aspect is that the physical space required to store these objects is incomparably reduced. Those ten thousand books can easily fit not just in your pocket, but on your fingernail, on a microchip. These two facts combined mean that digital archives can be enormously large, and may therefore potentially have less attention paid to selection and curation of the ‘most worthy’ items. On top of this, as we have described earlier, many large cultural organisations are also now making large efforts to digitise their collections and make them available online, to allow a greater reach and significantly easier access.

When you can keep everything, it makes sense to do so. Where pictures were previously precious and only those most promising were developed from negatives and then chosen to be put into an album, now you can store hundreds of digital photos from every day of your life. And people are increasingly doing so.<sup>7</sup> This may seem frivolous, but it may be valuable data for social scientists and historians of the future. As Featherstone puts it ‘should we not seek to extend the walls of the archive to place it around the everyday, the world? If everything can potentially be of significance shouldn’t part of the archive fever be to record and document everything, as it could one day be useful?’ (Featherstone, 2000). The internet has allowed anyone to ‘publish’ their writing or make it available simply through starting a blog. The practice of ‘life logging’ is becoming more widespread, and technology is making it easier to collect data from all aspects of your life to add to your ‘personal record’. The mechanisms for this may range from a camera that hangs around your neck or is fixed on your glasses (such as film maker and artist Alan Kwan has been wearing since November 2011) to more abstract ‘quantified self’ applications such as the Fitbit which record information about activity, sleep patterns or other aspects of one’s daily life.

Of course, while this information is all in the digital space, it is not necessarily in the digital *public* space. But increasingly, such personal archives are not stored locally on private machines, either because distributed (cloud) storage is more convenient, or because sharing has become entangled with storage on services such as Flickr and Facebook. People like to share, even data that might have once been considered extremely private; there are many discussion forums where those in the quantified-self movement share and compare data they have gathered about daily habits. Additionally, the person digital information relates to is not always the person who creates and holds it. Businesses now collect large amounts of information on us. Some of this is gathered through our interaction with websites and online services, particularly social or

linked services or those who make their money through knowing which adverts we might find relevant. Some may be gathered via our physical actions in the real world, such as CCTV cameras or use of loyalty cards. The Open Data movement advocates making as much data as possible from governmental or publically funded service available for open use. The reasoning for this is that doing so gives greater power to data analysis that can be used to benefit wider society. All of this adds up to a cloud of information trailing off us into the digital space all the time.

With this much information available, we must consider two critical aspects of its storage and sharing; the overall collection and its management, and how objects are accessed and retrieved in way that is meaningful. This process of retrieval from such a large store means that selection processes must be used, and these can lead to conscious or unconscious biases in what is selected. This will be explored in more detail later in Chapter 7.

Beer and Burrows (2013) identify four interrelated categories of archive that are not mutually exclusive, but which categorise and describe the way that this ‘sea of data’ and online information can be thought of. These are: transactional archives, archives of the everyday, viewpoint or opinion archives, and crowdsourcing archives.

*Transactional archives* are perhaps the closest to traditional libraries, in that they contain materials which have been produced or put online specifically so that they can be purchased or selected, and downloaded or viewed. This would include examples such as iTunes and Amazon or the BBC iPlayer. While money does not necessarily have to be exchanged to obtain something from these archives, there is a transaction taking place in that, in return for being given access to the content, information is provided as to who is accessing it. This may simply be a record of the number of times that it is downloaded, or may be more complex user data. For example, it could be connected to profiles (which could include details of demographics or location) and other purchasing behaviour. This archive of transactional information may be critical for commercial organisations that use this to create revenue.

The second category, *archives of the everyday*, covers documentation of mundane daily life, and include much of the self-generated information that we have described above; either the things that people share and post on social networking sites such as Facebook and Twitter about their activities, or via lifelogging and other self-quantification methods. These are not necessarily produced with the direct intentions of being a persistent archive, but may arise out of transient ‘status updates’ to be shared in a particular moment to connect with others. However, the overall collection of this data when gathered together can be used for powerful ends such as assisting anthropologists and sociologists in analysing ‘everyday’ behaviour.

The third type of archive identified by Beer and Burrows is the *viewpoint or opinion archive*. In this they include blogging and microblogging which is providing an opinion on something or giving insight into the viewpoint of the creator. They also include in this category the practice of commenting, rating and reviewing – this might be structured reviews on sites that collect feedback for a product or service, but also comment systems on blogs or forums, or perhaps even the practice of clicking a ‘like’ or ‘favourite’ button. Although these very simple interactions might not seem to contain much information, they may reveal surprisingly more in a networked space. For example, a study from Cambridge University showed that individual traits such as sexuality could be predicted to quite a high accuracy level by aggregating ‘likes’ on Facebook (Kosinski et al, 2013).

The final category of archive in Beer and Burrows’ classification is that of *crowdsourcing archives*. These are communally constructed archives such as wikis that build up not only contributions from many authors, but also associated metadata about when (and sometimes why) changes and updates were made. This arguably might also include certain contributory comments sections on blog posts which can (especially on systems which allow nested