

Outdated Museums

Creating Ethical and Transparent Data Collection Processes
in Museums

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Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy

December 2022

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Acknowledgements

The PhD process is conducted over a large chunk of life and I wish to offer my gratitude and appreciation to everyone who has been part of this journey in small and large ways over the last few years.

Thank you to everyone who has given their time and energy to participate in the research process. Your wisdom, honesty, and insights made everything here possible.

Thank you to my supervisors Prof Boriana Koleva, Prof Steve Benford, Dr Jocelyn Spence, Dr Steph Coen, and Dr Isla Forsyth for your support, critique, laughter, and grace. And carrot cake.

I am also grateful to all members of the Horizon CDT, Mixed Reality Lab, and GIFT project who have guided, challenged, and empowered me – too many to name but all of whom have my eternal gratitude, particularly Christine, Dimitri, Ed, Ian, Hanne, Pat, Pepita, and Velvet who have seen me at my most weird and can still make eye contact with me.

Finally, thank you to my friends and family for your patience, love, and teasing. The last four years of life have been historically strange and I do not know how I could have done this without you all being even stranger. To my Mum, Dr Trudi Cameron, my unofficial supervisor, for doing it first and sharing your experiences, unwavering faith, and office with me. My Dad for always being willing to listen to my ranting with bemusement and insight. My sister, her husband, and the newest member of our family Lily Sonia for coming home when I needed you. Grandmama for never once doubting me. Kareem for naming this thesis and for explaining that power means 'P=E/t, idiot'. Jessie for listening to my dramatic renditions of the T&Cs. My Saturday siblings for gloating that they weren't doing a PhD. Al, Colleen, Elis, Lozz, Steve, Tobi, and Willow for live, laugh, loving. And at last, to my dear Sam for being just like Gandalf and appearing precisely when you were meant to.

This thesis is supported by the Horizon Centre for Doctoral Training at the University of Nottingham (UKRI Grant No. EP/L015463/1) and by Nottingham Contemporary.

Abstract

UK museums are contradictory sites of education and community outreach, and emblems of colonial legacy and elitism. Physical and socioeconomic barriers prevent meaningful engagement for audiences, but particularly marginalised peoples. To identify and overcome these barriers, museums and cultural institutions are seeking technological solutions that capture and analyse personal data. However, current legislation and attitudes towards personal data also risk perpetuating exclusionary barriers. Many governments and organisations use personal data to suppress, undermine, and violently target minoritised or marginalised communities whilst upholding the status quo that marginalised them in the first place. This inequality is further entrenched by the powerlessness most people feel in the face of how data is collected and used on a day-to-day basis.

Drawing on Human Computer Interaction, Human Geography and New Museology, this PhD thesis seeks a solution to these concerns that empowers museums to safely collect the data they need whilst enabling audiences to become active in their own data curation. Using co-creative principles, input is sought from museums and audiences to answer three questions:

- How are discourses and practices surrounding personal data negotiated, defined, perpetuated, and resisted in museums?
- What is the value of personal data to museums and audiences?
- Can mutually beneficial and transparent data exchange foster meaningful, long-term relationships between museums and audiences?

To address these questions, a novel theoretical framework that explores *museums as place*, *technology as mediator*, and *relational personal data* through a lens of power is generated. Four sequential studies are then conducted utilising a post-structural feminist epistemology. The first study presents a content analysis of privacy policies to explore what data museums typically collect and how that information is conceptualised and shared with audiences, showing that museums collect a broad range of quantitative data but inadequately express to audiences what, how, or why. The second study presents a workshop with museum staff to determine what data would benefit the museum and what prevents it from being

captured. It shows that museums seek qualitative, behavioural data but are limited by resource constraints. The third study uses workshop style activities to ask audiences to conceptualise the value of their desirable data and speculate different ways for their data to be used in the museum. The study highlights barriers to data engagement including fatigue and lack of understanding, and shows trust and transparency to be key motivators in data sharing. The fourth study uses a novel methodology to speculate a data-enabled museum visit, from which a technology probe called 'MuNa' is developed and tested in a virtual museum visit with real audiences. Evaluation shows how transparency and trust can be synchronously developed through meaningful engagement with data. This is shown to increase the engagement of audiences with both museum *and* data, fostering long-term, meaningful relationships between venue and visitor and the creation of data subjects able to advocate for their own data rights.

The implications of this research reach across each of its disciplines and into the everyday practices of cultural organisations and audiences. Contributing novel paradigms of understanding surrounding the museum visit experience including different stakeholder perspectives addressing museums, technology, and personal data, the thesis presents evidence of an equitable and sustainable, data-enabled future.

Contents

Acknowledgements	i
Abstract	ii
Contents.....	iv
Index of Figures	ix
Index of Tables.....	ix
Glossary and Abbreviations	x
List of Publications	xii
1.0 Introduction	1
1.1 Background and Motivation.....	1
1.2 Areas of Study	4
1.3 Contributions and Personal Reflections.....	5
1.4 Research Questions.....	8
1.5 Overview of Thesis Structure	10
Background and Approach.....	11
2.0 Literature Review	12
2.1 Introduction.....	12
2.2 Power	13
2.3 Introducing Museums as Place	16
2.3.1 The Roles and Affordances of Museums	17
2.3.2 How New Museology is Changing Museums.....	21
2.3.3 Museum Visitors – Who, What, and Why	23
2.3.4 The Power of Museums and their Stakeholders	28
2.3.5 How Meaning-Making, Loyalty, and Trust Affect Museum-Visitor Relationships	31
2.4 The Use of Technology and Personal Data in Museums.....	34
2.4.1 The Power of Technology	35
2.4.2 Previous Examples of Technology Interventions in Museums	38
2.4.3 The Risks and Opportunities of Personal Data in Museums.....	42
2.4.4 The Power of Personal Data	48
2.4.5 Using Digital Gifting to Reframe Data Exchange Methods	51
2.5 Summary	55
3.0 Epistemology, Methodology, and Methods	57

3.1	Theoretical Frameworks to Guide Qualitative Research	57
3.2	Post-Structural Feminism	60
3.2.1	Methodology and Methods for Post-Structural Feminism.....	62
3.2.2	Limitations and Contestations of Post-Structural Feminism	64
3.3	Methods for Data Collection and Analysis	66
3.3.1	Collection and Analysis Methods Overview	67
3.3.2	Content Analysis	68
3.3.3	Reflexive Thematic Analysis.....	70
3.3.4	Data-Informed Design Fictions	71
	Empirical Research.....	74
4.0	Contextualising Personal Data in Museums: Study One	75
4.1	Introduction and Background	75
4.2	Designing the Study.....	79
4.2.1	Identifying Privacy Policies.....	80
4.2.2	Extrapolating Data from Privacy Policies	81
4.2.3	Analysing the Privacy Policies	82
4.3	Findings	82
4.3.1	Accessing the Privacy Policies and their Content	82
4.3.2	Data Types and Data Topics Identified in Privacy Policies.....	84
4.4	Discussion.....	91
4.4.1	Transparency and Accessibility Regarding Data Collection Practices	91
4.4.2	Inferring Data Priorities of Museums from Types of Data Collected	92
4.4.3	Exploring the Value of Data Topics to Museums.....	94
4.4.4	Overcoming Limitations	96
4.5	Contributions to the Conceptual Framework and Summary.....	96
5.0	Understanding the Needs of Museums and their Staff: Study Two.....	99
5.1	Introduction and Background	99
5.2	Designing the Study.....	100
5.2.1	Introducing the Museums.....	101
5.2.2	Running Workshops with Museum Staff	102
5.2.3	Analysing the Data	104
5.3	Findings	104
5.3.1	How Power is Experienced in the Museum.....	107

5.3.2	Data Collection and Usage in Museums	109
5.3.3	Data Collection Technologies in Museums.....	115
5.3.4	How Museums Change over Time	117
5.3.5	Potential Futures for Museums	119
5.4	Discussion.....	120
5.4.1	The Roles of Data and Technology in the Museum.....	120
5.4.2	Museums versus the World	123
5.4.3	Speculative Futures of Museums.....	126
5.4.4	Overcoming Limitations	128
5.5	Contributions to Conceptual Framework and Summary	128
6.0	Contextualising Museum Visits with Audiences: Study Three	132
6.1	Introduction and Background	132
6.2	Designing the Study.....	135
6.2.1	Recruiting Museums and Audiences	136
6.2.2	Designing the Activities.....	138
6.2.3	Designing the Online Alternative	140
6.2.4	Collecting and Analysing the Data	141
6.3	Findings	142
6.3.1	The Participants	142
6.3.2	Activity One – Silhouette Activity	144
6.3.3	Activity Two – Identifying Data.....	150
6.3.4	Activity Three – Value of Data	152
6.3.5	Activity Four – Reciprocation.....	155
6.4	Discussion.....	157
6.4.1	Audience Attitudes to Museums, Technology, and Personal Data	158
6.4.2	How Audiences Make Museums Meaningful	162
6.4.3	Re-imagining the Museum through Speculative Futures	164
6.4.4	Overcoming Limitations	167
6.5	Contributions to Conceptual Framework and Summary	168
7.0	Re-imagining the Museum: Study Four	172
7.1	Introduction and Background	172
7.2	Designing the Study.....	173
7.2.1	Using Technology Probes to Elicit Reflection	174

7.2.2	Using Design Fiction to Re-imagine the Museum.....	176
7.2.3	Choosing the Museum and Recruiting Participants	182
7.2.4	Collecting and Analysing the Data	185
7.3	Findings	191
7.3.1	The Participants	191
7.3.2	Comparisons between Groups	194
7.3.3	Reflexive Thematic Analysis.....	199
7.4	Discussion.....	213
7.4.1	The Impact of Transparency on Visitor Willingness to Donate Personal Data	213
7.4.2	The Impact of Mutuality on Willingness to Donate Personal Data	217
7.4.3	Using Personal Data to Increase Accessibility and Inclusivity of Museums to Different Audiences.....	220
7.4.4	Reflections on the MuNa App and Future Considerations.....	226
7.4.5	Overcoming Limitations	230
7.5	Contributions to Conceptual Framework and Summary	230
	Synopsis.....	233
8.0	Conclusions, Recommendations, and Future Research	234
8.1	Summary of Empirical Research.....	234
8.2	Utilising the Framework.....	237
8.2.1	Museums as Place.....	237
8.2.2	Technology as Mediator	238
8.2.3	Relational Personal Data.....	239
8.3	Theoretical Contributions and Practical Recommendations	240
8.4	Critical Reflections and Overcoming Limitations	243
8.5	Future Research Opportunities.....	244
	Reference List	245
	Appendices.....	265
	Appendix One – Spreadsheet of Privacy Policy Findings	266
	Appendix Two – Information Sheet and Consent Form for Study One	283
	Information sheet for museum staff	283
	Consent form for museum staff	285
	Appendix Three – Information Sheet and Consent Form for Study Three	288
	Information sheet for in person workshops.....	288
	Consent form for in person workshops.....	290

Information sheet for online activities	293
Consent form for online activities	295
Appendix Four – Data-Informed Design Fiction.....	298
Appendix Five – Information Sheet and Consent Form for Study Four.....	302
Information sheet for virtual museum visitors	302
Consent form for virtual museum visitors.....	304
Appendix Six – MuNa Examples	307
Arthur’s MuNa Profile.....	307
Alice’s MuNa Archive.....	309

Index of Figures

Figure 1. Flow Chart of Empirical Study Progression	9
Figure 2. Sub-questions Addressed in Study One	75
Figure 3. The Six Stage Sequential Process to Identify Privacy Policies	81
Figure 4. Word Cloud of Data Types Identified across all Privacy Policies	89
Figure 5. Venn Diagram of Conceptual Framework Contributions from Study One	97
Figure 6. Sub-questions Addressed in Study Two.....	99
Figure 7. Venn Diagram of Conceptual Framework Contributions from Study Two.....	129
Figure 8. Sub-questions Addressed in Study Three	133
Figure 9. Miriam's Silhouette Activity Sheet.....	139
Figure 10. Venn Diagram of Conceptual Framework Contributions from Study Three	169
Figure 11. Sub-questions Addressed in Study Four	173
Figure 12. A Screenshot Taken in Gallery Four of the Virtual Bauhaus Exhibit.....	183
Figure 13. A Screenshot of the Floorplan Provided for the Virtual Bauhaus Exhibit	184
Figure 14. Flow Chart of Group Trajectories.....	186
Figure 15. Arthur's MuNa Profile	188
Figure 16. Alice's MuNa Archive	190
Figure 17. Venn Diagram of Conceptual Framework Contributions from Study Four	231

Index of Tables

Table 1. Data Types Identified in Museum Privacy Policies Prevalence.....	84
Table 2. Data Topics Identified in Museum Privacy Policies Prevalence and Definitions	90
Table 3. Reflexive Thematic Analysis Codes and Descriptions (Study Two).....	105
Table 4. Data Types Identified by Museum Staff and their Assigned Data Topics	110
Table 5. Data Uses in the Museum	113
Table 6. Museum Audience Demographic Information	143
Table 7. Responses to Silhouette Activity Questions One and Two	144
Table 8. Responses to Silhouette Activity Questions Three and Four.....	146
Table 9. Responses to Silhouette Activity Questions Five and Six.....	148
Table 10. Museum Audiences Responses to Prompts about their Data	153
Table 11. MuNa Functionality Origin Points	176
Table 12. Virtual Museum Visitors Demographic Information.....	193
Table 13. Data Virtual Museum Visitors Shared with MuNa	196
Table 14. Data Virtual Museum Visitors Shared with the Museum	197
Table 15. Reflexive Thematic Analysis Codes and Descriptions (Study Four)	200

Glossary and Abbreviations

Arts Councils – A number of not-for-profit organisations committed to funding projects and prizes for artists and creatives. Arts Councils are typically funded by a combination of government bodies and private sector funding. The United Kingdom has Arts Councils for each country; England, Scotland, Wales, and Northern Ireland.

Audience Agency – A charity organisation funded by Arts Council England that collects, analyses, and shares data around arts, culture, and heritage across the United Kingdom and Europe.

Audiences/Visitors – Throughout this thesis, the term ‘audiences’ includes visitors, potential visitors, and non-visitors who are able to access cultural content through traditional engagement, outreach programmes, or digital means. The term ‘visitors’ is used explicitly to refer to people who physically access a museum site.

[GIFT Project](#) – An international research project funded by the EU Horizon 2020 research programme that explores the creation of hybrid museum experiences. The GIFT project involves artists, designers, museum professionals, and researchers from across Europe.

Department for Digital, Culture, Media, and Sport – A ministerial department that funds and promotes culture, arts, heritage, and sports in the UK. It sponsors 47 public bodies across the UK including Arts Council England and a number of museums and galleries including Tate, the Royal Armouries, and National Museums Liverpool.

Mural – An online collaborative software tool used throughout the research presented to enable virtual interaction and content sharing between researcher and participants, and participants and participants.

Museums/Galleries – This thesis initially specifically examined art galleries around the UK. However, as the research progressed it became clear that delineating between museums and galleries in terms of existing literature, legislation, and audience attitudes would be a task beyond the capabilities of this project, and further, one deemed unnecessary for the purposes of the research. Subsequently, whilst empirical research begins with a focus towards organisations that self-describe as galleries or art museums, this boundary blurs and is ultimately rejected. As such, ‘museum’ is used throughout the document to refer to all cultural or creative repositories inclusive of galleries.

Stakeholders – For the purpose of this thesis, ‘stakeholders’ is used to refer to any being or body with a vested interest in the museum. I use stakeholders to refer to museums, museum staff and volunteers, funding bodies, private funders, visitors, audiences, and local communities. I acknowledge the controversy that can be assigned to the phrase as embedded in colonial practice and negligent of non-traditional rights holders. I hope that my clarification of its use here negates any exclusionary interpretations.

ACE – Arts Council England (see above)

AR – Augmented Reality (see 2.4.1)

DCMS – Department for Digital, Culture, Media, and Sports (see above)

EU – European Union

GDPR – General Data Protection Regulation (see 4.1)

HCI – Human Computer Interaction (see 1.2)

MA – Museum Audiences (participants in 6.0)

MS – Museum Staff (participants in 5.0)

MuNa – Museum Navigation App (see 7.2)

NPO – Non-Profit Organisation

UK – United Kingdom

VMV – Virtual Museum Visitors (participants in 7.0)

VR – Virtual Reality (see 2.4.1)

List of Publications

This thesis has benefited from my involvement in other projects related to the thesis aims throughout the duration of the PhD. A number of these projects have been peer-reviewed for publication.

The **GIFT Project** provided connections, reflections, and theoretical frameworks through which this research was shaped. I was involved with a number of different sub-projects related to GIFT that have been published as:

Darzentas D., Cameron H., Wagner H., Craigon P., Bodiaj E., Spence J., Tennent P. and Benford S. (2022) Data-inspired co-design for museum and gallery visitor experiences. Artificial Intelligence for Engineering Design, Analysis and Manufacturing 36.

Benford S., Løvlie A.S., Ryding K., Rajkowska P., Bodiaj E., Darzentas D.P., Cameron H., Spence J., Egede J. and Spanjevic B. (2022) Sensitive Pictures: Emotional Interpretation in the Museum. CHI Conference on Human Factors in Computing Systems. New Orleans, LA, USA: Association for Computing Machinery, Article 455.

Spence J., Darzentas D., Cameron H., Huang Y., Adams M., Farr J.R., Tandavanitj N. and Benford S. (2021) Gifting in Museums: Using Multiple Time Orientations to Heighten Present-Moment Engagement. Human-Computer Interaction: 1-31.

Spence J., Darzentas D.P., Huang Y., Cameron H.R., Beestin E. and Benford S. (2020) VRtefacts. Proceedings of the 2020 ACM Designing Interactive Systems Conference. Eindhoven, Netherlands (Virtual): Association for Computing Machinery, 627-640.

I have also been involved in projects regarding space, place, and technological intervention in the cultural sector. Two of these are published as:

Spors V., Reyes Cruz G., Cameron H.R., Flintham M., Brundell P. and Murphy D. (2020) Plastic Buttons, Complex People: An Ethnomethodology-informed Ethnography of a Video Game Museum. Proceedings of the

*Annual Symposium on Computer-Human Interaction in Play. Virtual Event,
Canada: Association for Computing Machinery, 594-605.*

*Brundell P.R., Harlow N., Cameron H. and Bowden W. (2022) Rome is
Where the Heart is: Designing Immersive Experiences to Augment and
Build Personal Connections to Outdoor Environments. 25th International
Academic Mindtrek conference. Tampere, Finland, 318–323.*

(Recipient of Best Poster at MindTrek 2022)

1.0 Introduction

This thesis presents four studies that examine the role of power in the museum and identifies ways to create meaningful and long-term relationships between museums and audiences cognisant of power structures. Further, the research advocates for and supports institutional and social change regarding museum roles. Personal data comprises the central locus for change, offering a contemporary vision of future museum visit experiences built on trust and mutuality. In this chapter, I outline the purpose of this research project through an explication of background and motivation and offer three key questions that the research aims to answer. For contextualisation, I also define the academic disciplines that this research draws from and contributes to, before going on to reflect on the contributions the research makes to them, to industry, and to broader data practices. I end the chapter with an overview of the thesis structure.

1.1 Background and Motivation

In the United Kingdom (UK), museums play a number of important roles to local and international communities. Largely supported by government and local council funding, **UK** museums provide education and entertainment to visitor and broader audiences alike (Dodd and Sandell, 2001; Mendoza, 2017; Bourdieu, 1973; Bardzell, 2010; Gross and Pitts, 2015). However, cultural institutions face an ever-increasing number of challenges - financially, culturally, and socially – to maintain their relevance and position within society (Passebois and Aurier, 2004). Relevance, here, means ‘making a museum matter to its visitors’ (Vermeeren and Calvi, 2019: 2) and requires a commitment to implementing practices that are capable of unlocking meaning and value for audiences (Vermeeren and Calvi, 2019; Simon, 2010). Between 1997 and 2017 the arts sector in the **UK** lost, in real terms, over £109 million of governmental funding (Mendoza, 2017) owing to a combination of budget cuts and inflation. This has forced many museums to make fundamental changes to the ways that they operate. For some, it has meant ongoing corporate sponsorship such as from British Petroleum (British Petroleum, 2019; Perry, 2013) or Hyundai (Millard, 2014) affecting the freedom they have over what to exhibit (Schatteman and Bingle, 2017). For others, it has meant charging for entry to previously free-to-attend exhibits, which alters the expectations of (and accessibility for) visitors (Caldwell, 2002). For others still it has meant simply absorbing the loss – whether that means reducing what can be offered or closing

their doors altogether (Steel, 2012). Museums also face increasing pressure from alternative sources of entertainment (Falk and Needham, 2011; Petrelli et al., 2016), changing expectation of visitors (Caldwell, 2002), and the internet providing access to cultural content from the home (Oakley, 2009; Allen and Petterson, 2016; Easson and Leask, 2020).

Despite the urgency of adapting, museums have been accused of ‘remain[ing] aloof, inert, and torpid to every living influence – a mausoleum and a morgue’ (Kent, 1928, as cited in Duncan, 2002: 101), unwilling to change or take risks for fear of losing visitors and revenue. However, with the loss of visitors and revenue already occurring, museums are finding it increasingly important to *redefine* the ways that they propose to be relevant to their communities and audiences to ensure their long-term survival in a world that economically values them less each year. Very recently, the COVID-19 pandemic has forced museums around the world to rapidly accelerate some of these adaptations, although the long-term impact of this is yet to be understood (Galani and Kidd, 2020).

One avenue of growth that offers impactful and accessible opportunities is in the implementation of novel technologies (see section 2.4.1). Technologies have been commonly integrated as part of the **UK** museum visit experience since the 1990s (Petrelli and O'Brien, 2018). The rapid evolution of technologies in terms of capability and accessibility offer numerous benefits to the museum that cover a broad range of experiences on- and offsite, providing increased interactivity and opportunities for meaning-making before, during, and after a museum visit (discussed in section 2.4.2) (Zollo et al., 2021; Petrelli and O'Brien, 2018; Petrelli et al., 2016; Murphy, 2019). Technology has also become increasingly relevant following the shift in the 1980s that influenced many **UK** museums to reinvent their practices towards principles of New Museology (see section 2.3.2). New Museology centres the visitor by advocating for tangible, interactive experiences that decentralise narratives and empower different perspectives and modes of engagement (Stam, 1993; Howes, 2015; Recupero et al., 2019; Simon, 2010; Geoghegan, 2010). As technologies have evolved in recent years, so too have the purposes of those technologies and how they work. Many contemporary technologies, for instance, are influenced by the collection and analysis of personal data. In the museum, such technologies are increasingly utilised by visitors (for instance through mobile phone usage and social media), by the museum (through first hand and third party sources), and by funders (via the

resources of the museums). As such, personal data can be seen as an increasingly accessible resource that can be used as a driver of technologically-enhanced museum experiences and as a resource for museums to monitor their roles and effectiveness in the world (see section 2.4.3).

Despite the possibilities personal data offers for positive change (Tene and Polonetsky, 2011), its current usage both within the museum and beyond is one that is broadly detrimental to everyday people (see section 2.4.4) (Taylor, 2017; Hoffmann, 2020; D'Ignazio and Klein, 2020). In daily life, personal data is collected from the general public through invasive, non-consensual, and invisible means and used to coerce, control, or confine people in ways that are particularly harmful to already marginalised communities (D'Ignazio and Klein, 2020; Hoffmann, 2020; Taylor, 2017; Benjamin, 2019). As data misuse becomes more embedded in daily life and societal and governmental awareness of data exploitation increases, it becomes more and more pressing to address data misuse in practical and long-lasting ways (Vitale et al., 2020; Wook Kim et al., 2019). In this regard, museums are in a unique position to draw attention to data injustice and afford change by using their status as educators of historic and contemporary issues to push for alternative ways of approaching data (see section 2.3.1) (Duncan, 2002; Dodd and Sandell, 2001; O'Neill, 2019), whilst also developing ethical data collection processes of their own and furthering their relevance in a technologically-driven world. Specifically, this thesis calls on museums and designers to advocate for a method of data exchange that is transparent, mutually beneficial, and sustainable (see chapter 7.0).

The canon of work regarding how museums can embody and encourage societal change is generous (see section 2.3.1) (Bourdieu, 1973; Bardzell, 2010; Ruggiero et al., 2021; Mendoza, 2017; Morse, 2020; Dodd and Sandell, 2001). However, practical examples of the museum being used to *instigate* radical societal changes are slim (Simon, 2010), and the body of work regarding using personal data within the museum for such a goal is next to non-existent. Taking advantage of wide-sweeping social and political changes affecting museums and personal data, this body of work seeks to change the narratives of both museums and data towards one of empowerment. To do so, the thesis presents a novel conceptual framework combining *museums as place*, *technology as mediator*, and *relational personal data* read through a lens of power (see section 2.1). This framework emerged

symbiotically with the research – shaping and shaped by iterative reflections on findings of empirical research and existing knowledge. Using this framework, this thesis shows that transparent and mutually beneficial data exchange is possible and offers a frame of *gifting* (see section 2.4.5) to embed such an exchange within the museum, which is further shown to have capacity to affect the world beyond the museum. Further, as the thesis progressed, trust and inclusivity emerged as vital to instigating meaningful change for and within the museum, and such concepts are explored consistently throughout each of the four original studies (chapters 4.0, 5.0, 6.0, 7.0).

1.2 Areas of Study

The topics engaged with in this research are broad, examining a range of human experiences and attitudes within different contexts and from different perspectives. In order to ensure that this diversity is fully embedded in the research, this thesis utilises a multidisciplinary approach, drawing on a rich diversity of academic approaches and schools of thought to tackle the questions presented. Most notably, literature, methodologies, and methods are integrated from schools of Human Computer Interaction, Human Geography, and New Museology. As this thesis aims to be understandable by a diverse range of audiences, I offer a brief definition of each school and highlight the contributions it makes to this research.

Human Computer Interaction (**HCI**) is a multidisciplinary approach to research that sits between Computer Science, Engineering, and the Social Sciences and focuses on the design and evaluation of technologies to support human activities (Carroll, 2003). This thesis specifically draws on *Humanistic HCI* as defined by (Bardzell and Bardzell, 2016):

...any research or practice that deploys humanistic epistemologies (e.g., theories and conceptual systems) and methodologies (e.g., critical analysis of designs, processes, and implementations; historical genealogies; conceptual analysis; emancipatory criticism) in service of HCI processes, theories, methods, agenda settings, and practices' (Bardzell and Bardzell, 2016: 22)

Integrating an even broader multidisciplinary approach to **HCI** than highlighted in this definition allows us to 'ask better questions about technology and society and to take up

our designerly practices towards a more diverse range of critical positions' (Devendorf et al., 2019: 1) including tackling power, justice, and meaningful change (Keyes et al., 2019). This thesis relies on **HCI** to ground design processes within rigorous and influential principles of co-creation and reflexivity that are capable of addressing the principles listed.

Human Geography is 'the study of the spatial organization of human activity and peoples' relationship with their environments' (Daniels et al., 2005: 2). Human Geography recognises the world we live in as socially constructed and uses quantitative and qualitative research to critically and reflexively interpret it. Relying heavily on diverse and constantly evolving methodological approaches to research, Human Geography explores all factors of human experience across economic, social, and political influence and beyond (Brunhes, 1925). This thesis relies on Human Geography to ground empirical research in the context of place and to provide well-developed and reflexive methodologies and methods. In particular, post-structural feminist geographies offer a lens that can approach the museum site (both physical and virtual) as socially constructed and constantly in flux.

New Museology is a branch of museum studies that focuses on exploring the societal roles museums can play in the contemporary world (Eklund, 2020; Geoghegan, 2010). New Museology centres visitors and audiences as integral to the museum visit experience and ensures that organisations are meeting their diverse needs including fun, emotional resonance, and meaning-making (Recupero et al., 2019). In the context of this thesis, New Museology offers vital contextualising information about the museum institution including its priorities, practices, roles, and future needs.

As shown, the approaches to research utilised throughout this thesis are complex and inherently multidisciplinary. Each lends unique value to this project that is reinforced and enhanced through its integration with the other(s).

1.3 Contributions and Personal Reflections

This thesis takes a post-structural feminist approach to research that centres the experiences of individuals within the context of the museum visit. This approach, which is explained in depth in 3.2, advocates for a reflexive research process that is cognisant of underlying power structures and societal hegemonies and capable of generating meaningful change. As such, throughout this project I consider my own positionality as both researcher

and research subject, and reflect on relevant elements of this in 3.1. Whilst the needs, opinions, and experiences of all participants who contributed their time and knowledge to this endeavour are platformed at the heart of all findings, my experiences and priorities cannot be removed from the context of the research project. As such, I am also reflected in the work that I undertake and the ways I encourage its reception (Haraway, 1988; Rose, 1997). It is for this reason that this thesis is presented in first person.

In addition to my own positionality it is important to contextualise the other influences that have shaped this thesis. First and foremost, this PhD is funded and supported by the UKRI Horizon Centre of Doctoral Training (CDT). The Horizon CDT is a multidisciplinary centre of research that recruits and trains PhD researchers to explore ‘digital identity, personal data, and data creativity within the global digital economy’¹. As such, these concepts are deeply embedded in the research from inception. Further, each Horizon CDT student works with an industry partner who helps them choose and iterate research questions that are meaningful to that partner’s industry. My industry partner was Nottingham Contemporary, an international contemporary art gallery based in Nottingham, UK.

As this work is so embedded in Nottingham, I offer a brief overview of the city’s relevant history. Nottingham has a long history with arts and cultural institutions, boasting a number of well-recognised names such as the Nottingham Castle², the National Justice Museum (previously the Galleries of Justice) and City of Caves³, and Nottingham Contemporary⁴, which have contributed in recent years to a huge resurgence and prioritisation of culture within the city. Even so far back as the 17th century, Nottingham was well known for its lacemaking practices and was granted its city charter directly as a result of its ties to the lace industry (Beckett and Brand, 1997). In 2012, £60 million of local council and government funding was poured into creating Nottingham’s Creative Quarter which covers the east of the city centre (Creative Quarter, 2020; Nottingham City Council, 2012; HM Government, 2012). The Creative Quarter was created to support development of high tech businesses and entrepreneurs, with a particular focus on Generation Y (people born between 1981 and

¹ <https://cdt.horizon.ac.uk/>

² <https://www.nottinghamcastle.org.uk/>

³ <https://www.nationaljusticemuseum.org.uk/>

⁴ <https://nottinghamcontemporary.org/>

1996). This gave birth to a dramatic rise in cultural and creative independents moving into the area through its funding of creative and small business spaces. For example, Sneinton Market⁵ was revitalised for small, independent businesses to create and sell their wares, studio type spaces such as Backlit⁶ and the Nottingham Writer's Studio⁷ were created, and larger creative ventures like the National Videogame Museum⁸ were born. Nottingham's creative legacy from this funding was well acknowledged and in 2015 Nottingham was named a 'City of Literature' by UNESCO due to its consistent commitment to artistic and cultural practices (UNESCO, 2015). There are also a great number of city-wide events throughout the year that celebrate arts and culture, such as Light Night⁹, the Mela festival¹⁰, and Hockley Hustle¹¹. Arts and culture are therefore deeply embedded in the city as fundamental to the way that the city understands itself and is perceived by the rest of the world.

This PhD project began at Nottingham Contemporary, an international art gallery based in Nottingham that displays four to five exhibits from international artists each year. The Nottingham Contemporary celebrated its 10th anniversary of being open in 2019 and is internationally recognised for its iconic building, its programme of exhibits, and its outreach and public engagement programmes (Nottingham Contemporary, 2019). They have strong ties with both local universities and were my industry partner throughout the PhD. As part of our working relationship, Nottingham Contemporary hosted me for an internship and enabled me to make connections with other museums and cultural institutions around Nottingham who became part of the project in varying capacities.

The influences described above and the areas of study detailed in 1.2 were integral to not just plan and conduct the research, but also to frame the contributions this research makes. The thesis generates theoretical and practical takeaways that contributes to each of academic disciplines as well as to practitioners and regulators related to the fields of museums and personal data. Contributions are explored in depth in 8.3 and include novel

⁵ <https://www.sneintonmarketavenues.com/>

⁶ <https://backlit.org.uk/>

⁷ <https://www.nottinghamwritersstudio.co.uk/>

⁸ <https://thenvm.org/>

⁹ <https://www.visit-nottinghamshire.co.uk/whats-on/light-night-2022-p488231>

¹⁰ <https://www.visit-nottinghamshire.co.uk/whats-on/nottingham-mela-festival-2022-p663691>

¹¹ <https://www.hockleyhustle.co.uk/>

insight into museums and museum audiences, critical examination of societal discourses regarding museums and personal data, and the re-imagining of an established research method.

1.4 Research Questions

The PhD began with one overarching aim presented by the project's industry partner – to understand how personal data can create more meaningful, long-lasting relationships between museums and audiences. As the research progressed, three research questions were iteratively developed towards this broader goal:

Q1. How are discourses and practices surrounding personal data negotiated, defined, perpetuated, and resisted in museums?

Q2. What is the value of personal data to museums and audiences?

Q3. Can mutually beneficial and transparent data exchange foster meaningful, long-term relationships between museums and audiences?

These questions both informed and emerged from the empirical research conducted. Each sequential study addressed sub-questions that shaped and were shaped by the broader research goal. Figure 1 offers a flow chart that captures the evolution of the studies and the key questions investigated by each.

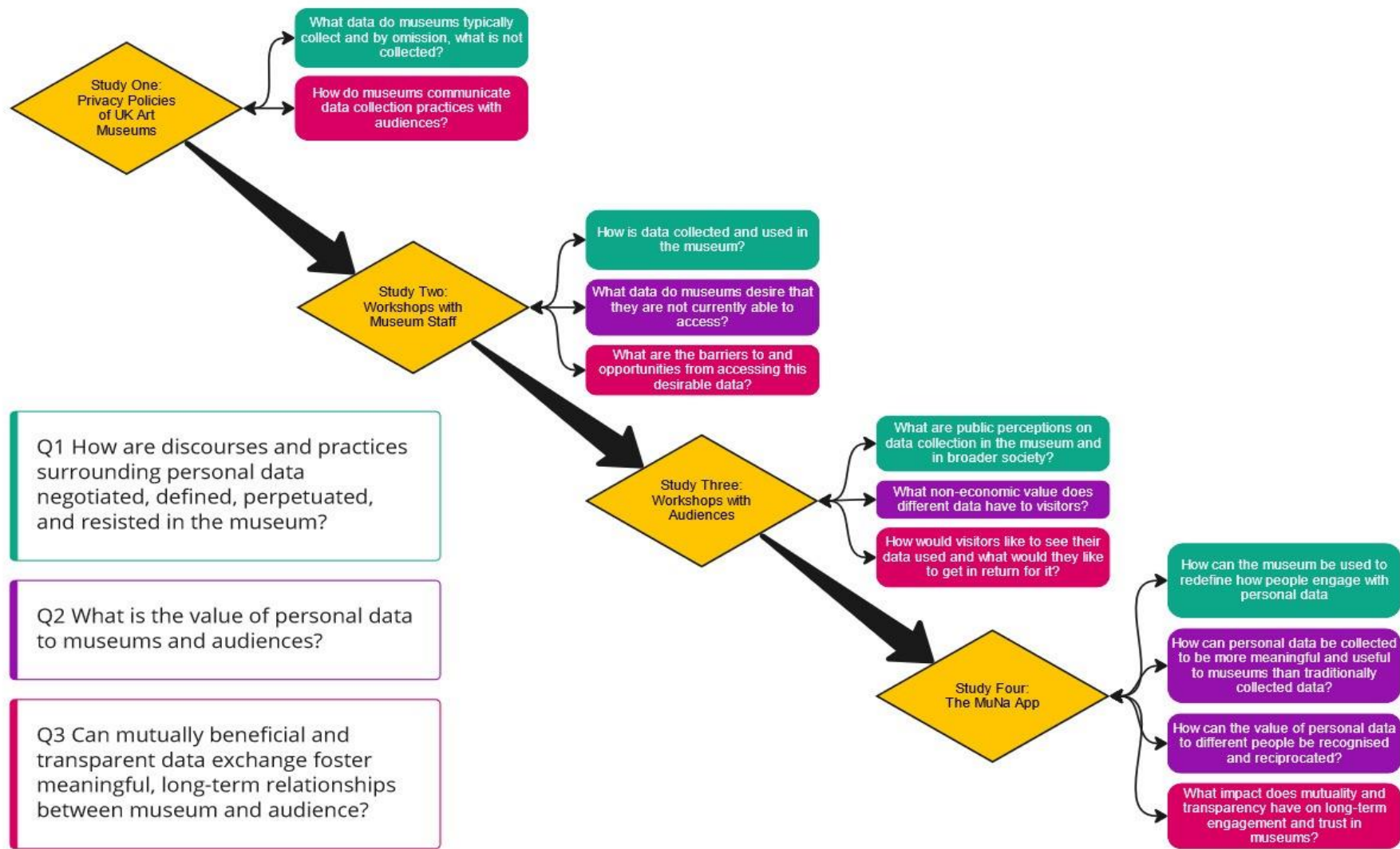


Figure 1. Flow Chart of Empirical Study Progression

The four studies used a variety of data collection and analysis methods to approach the questions, engaging with principles of co-creation to ensure diverse stakeholder perspectives were considered (explored in 2.3.4). To provide cohesion, the thesis employs a post-structural feminist epistemology that frames and guides the consistent application of methods and methodologies. This was particularly important for studies three and four, which were deeply impacted by the COVID-19 pandemic and were forced to rapidly and reflexively adapt to ensure participant and researcher safety.

1.5 Overview of Thesis Structure

- Chapter Two - Literature Review. Outlines the theoretical framework underpinning the thesis and presents a multidisciplinary literature review relating to the framework themes.
- Chapter Three - Epistemology, Methodology, and Methods. Details the methodologies and methods applied to the empirical research conducted.
- Chapter Four - Contextualising Personal Data in Museums: Study One. Presents the findings of a topic-modelling based content analysis conducted on UK art museum privacy policies.
- Chapter Five - Understanding the Needs of Museums and their Staff: Study Two. Presents the findings of a reflexive thematic analysis conducted on a workshop run for museum staff.
- Chapter Six - Contextualising Museum Visits with Audiences: Study Three. Presents the findings of a Content Analysis from research engagement with museum audiences.
- Chapter Seven - Re-imagining the Museum: Study Four. Presents the development, testing, and evaluation of a design probe used by museum visitors.
- Chapter Eight - Conclusions, Recommendations, and Future Research. Summarises and discusses the conclusions of the PhD including implications and recommendation for museums, practitioners, and researchers.



Background and Approach

2.0 Literature Review

2.1 Introduction

This thesis pulls together literature, methodologies, and methods from a diverse range of academic disciplines to develop an original conceptual framework regarding *museums as place*, *technology as mediator*, and *relational personal data*. Each concept is explored through a lens of *power* and iteratively evolves throughout the empirical research. This chapter presents an exploration of literature from **Human Computer Interaction (HCI)**, **Human Geography**, and **New Museology** and explores the overlap, similarities, differences, and omissions that together begin to address the core questions of the research.

The chapter begins with an overview of power, drawing together three distinct but overlapping conceptualisations to explore how power can be used as a tool for change. This section details how the lens is understood and conceptualised throughout this thesis and presents the basis of the epistemological lens detailed further in 3.2. Pulling together the works of Max Weber, Barry Barnes, and Michel Foucault, power is shown to be embedded deeply in the social world, shaping and being shaped by the people and communities who live there. Further discussions of power are subsequently integrated with the proceeding sections to contextualise power within the conceptual framework. I begin to explicate the framework by turning first to the literature surrounding **museums** in their current state, where I illustrate out museums' social and cultural significance, point to relevant financial and governmental policies, and introduce the various **stakeholders** involved in museum experiences. In this section, I highlight how museums are centres of social change with a responsibility to reflect on and make space for change within society, as well as exploring the changing roles of museums and the impact of the wide-spread adoption of principles of New Museology. Following this introduction of *museums as place*, I turn to engage more explicitly with the second and third elements of the conceptual framework – *technology as mediator* and *relational personal data*. This section explores the current mediating role of technology within the museum, previous interventions that have shaped the thesis, the collection and use of personal data within museums, and how my involvement with the EU Horizon 2020 arts-led **GIFT Project** has shaped the frame through which this research is approached. This section finds that interactive technologies in the museum can have both beneficial and negative effects and explores alternatives to infrastructural or resource

intensive technological enhancements. It also explicitly examines the role of personal data in the museum setting and how a lens of digital gifting can encourage data exchange to be more mutually beneficial and reliable. With this knowledge in mind, the reader is equipped to engage with the methodology explicated in 3.0 and is provided the necessary information to understand the research as I present it and subsequently to engage consistently and critically with the four empirical study chapters presented.

2.2 Power

This thesis uses a lens of power to conceptualise, analyse, and tackle the questions presented. I develop power as a conceptual lens to enable a deep understanding of social, personal, political, and environmental influences that underlie interactions in the museum site and beyond. Drawing on the works of three theorists, I present a description of power that understands the different roles power can play. That is, I understand each theory within the broader context it addresses; individual, social, or societal. I present power here both as an explanation of how it can be seen and understood through this thesis, but also to equip you, the reader, to apply your own critical lens of power to the findings presented. As power is experienced universally, revealing how power is and can be used requires transparency and openness to be applied in such a way as to invite critical inquiry from other perspectives and experiences. The universality of power as something experienced by all people also necessarily highlights the relative nature of power, and one that must be explored in tandem within the contexts to which it is being applied. As such, this section of the literature review is presented in two ways; first, a dedicated section that details how power has been approached and conceptualised. Second, applied sections dispersed throughout the rest of this review, integrated within each following theme to highlight the presence of power within each.

Power is complex, multifaceted, and experienced in infinite ways. Sociologist Max Weber discusses power from the perspective of the *individual*. For Weber, power is a possession that results directly from resistance (Jordan, 2002b). It is the ability for one actor to carry out an intended action, despite resistance from another, thus increasing their own power whilst decreasing that of the dissenter (Brennan, 2020; Jordan, 2002b; Jordan, 2002a; Heiskala, 2016). Put simply, it is 'the probability of forcing one's will on the behaviour of others' (Brennan, 2020: In Chapter 3 - Power and Domination) in an asymmetric

relationship. As such, Weber conceptualises power as subjective and heavily reliant on available resources. In a posthumously published but highly influential paper *Class, Status, Party*, Weber goes on to discuss the effects of power on social stratification, in which he describes social inequality as how people are given access to or excluded from economic, social, and political resources (Weber, 2011; Weber, 1978).

Barry Barnes is another influential sociologist who critiqued the work of Weber for being overly reliant on economic resources to explain power (Barnes, 1992) and wrote at length on power from a *social* perspective. He points out that social groups who restrict resources do not do so for individual gain, but rather for collective gain. Given then that such action cannot be motivated by purely economic interests, he suggests it must instead be the symbolic, social nature of community that drives collective action (Barnes, 1992). As such, he describes power as communicative and evaluative, something generated by social order; by the collective actions of society, a shared understanding that those actions are correct, and trust that other members of society will hold the same knowledge and enact the same routines (Hearn, 2012; Jordan, 2002b). For Barnes, power is neutral, not malicious, and individual power comes from the choice to perform either with the social order, or against it. It is the capacity for action in which power *to* is more important than power *over* (Mazzotti, 2016).

Perhaps most influentially, philosopher Michel Foucault also wrote extensively on power. Rather than belonging to an individual or group, Foucault perceives power as *societal*. It is pervasive, coming from everywhere, and constantly in flux and negotiation in relation to its historic setting and social relations. He posits that power is omnipresent, inevitable, fluid, and held – to different degrees – by everybody within society who are simultaneously subject to and agents of power (Foucault, 1978). Because of its widespread nature, it is deeply embedded in knowledge, discourse, and social relations, and similar to the definition from Barnes, Foucault describes power as being disseminated and experienced by communities through social discourses. Foucault dubbed this use of social discourse to define meaning as the ‘Battle for Truth’ (Given, 2008b). The ‘Battle for Truth’ constitutes the ways that communities reject, accept, reaffirm, and even reinvent ‘truth’ (Kelemen and Rumens, 2008), thus defining what is deemed appropriate or not within a community setting. These accepted daily practices are experienced and enacted through *micropractices*

(Foucault, 1978) - social practices that constitute everyday life, the ways that people interact with each other, and how they navigate the world.

These definitions of power, while disparate in some ways, offer a holistic understanding of how power can be interpreted and understood relative to its context. By combining multiple definitions I hope to avoid falling into the category of 'theorists [who assume] that power is some kind of noxious phenomenon which is always exercised against people's interests' (Mazzotti, 2016: 119), but rather to approach it as something malleable, in flux, and capable of being wielded as a tool for meaningful change. Weber shows us that on an individual level, power can be seen as access or exclusion from resources. Barnes builds on this to explain that whilst this may be true, it is also a social phenomenon that drives community action and change. Foucault's definition aligns with these to suggest that power can indeed be experienced and perpetuated through resource distribution and social relations, but it is also a *societal* phenomenon that changes according to the rules and norms that are communicated and perpetuated through discourse. However, all three definitions provided contain a major flaw that must be exposed and tackled, as all three are written from perspectives that exclude the experiences of women or other gender minorities, ethnic and racial minorities, and (dis)abled peoples who may experience power in vastly different ways. For instance, where Weber explains power to be exclusion from resource distribution, minoritised and marginalised people may prioritise different resources from those being withheld, or even may never be included in society enough to have chance to be excluded at all. Where Barnes discusses rebelling against social order as the capacity to reclaim power, this does not account for identities who have no choice but to break social order just to survive. Foucault too embeds assumptions within his work about whose voices are heard loudest within a community to define the tolerated discourses, and fails to explore how micropractices can be reactive against power in and of themselves.

To combat these shortcomings, I narrow the field to focus on the discourses that shape power within the context of museums and technology and make the discourses embedded there visible, revisiting the works of Foucault to do so through exploration of subjectivities and identities (Kelemen and Rumens, 2008). Subjectivities are the experiences that shape the way an individual sees the world (Foucault, 1997). They necessitate the use of resources like everyday discourses and experiences to construct and codify multiple identities.

Identities are our consciously defined selves, shaped through cultural and socially circulated discourses, as defined by the subject. They are generated through exercising power and drawing on discourses such as occupation, gender, race, sexuality and so forth for their construction. These subjectivities and identities provide a means of sense-making and meaning-making, albeit not necessarily simultaneously or in the same context. However, I tacitly acknowledge that such subjectivities and identities are not experienced homogeneously. Instead, I call on subjectivities and identities as a way to approach the individual, to understand how power may be experienced, perpetuated, and resisted within their micro- and macro-practices. This in turn allows for uncovering how power is embedded in museums, enabling different practices of resistance, technologies, and discourse to emerge that are capable of redistributing power in this setting, and potentially even beyond (English, 2010).

2.3 Introducing Museums as Place

Museums are important and controversial spaces of education, socialisation, and cultural dissemination. But what makes the museum capable of all that is ascribed to it, and how can such meaning be approached by a researcher? To understand museums, we must attempt to make sense of the multifaceted roles they perform. For this, we turn to the concept of 'place'. Place, from the perspective of Human Geography, is far more than a physical location. At its core, place can be defined as 'a space with meaning' (Lefebvre, 1992; Cresswell, 2014). However, within this definition are multiple, complex layers of meaning, memory, and opportunities that fundamentally shape how place is experienced person to person (Bott and Banning, 2008; Jorgensen and Stedman, 2001; Shamai, 1991; Massey, 1994). For instance, Yi Fi Tuan (1979) influentially defined place as having four key elements to it: the physical (environmental), the personal (emotions, feelings, memories), the social (interactions), and the cultural (unwritten or written rules, cultural identities). Each of these elements work together to turn a space into a place with meaning, and each must be considered when attempting to work with place to understand or enhance it as in this research project.

Places are created fluidly and subjectively, and the relationships that people form with places are important for myriad reasons including identity formation and confirmation, community formation and cohesion, and education (Jorgensen and Stedman, 2001; Bott and

Banning, 2008; Shamai, 1991; Chang et al., 2015; Tuan, 1979). However, given the subjective ways that these elements are experienced person to person and organisation to organisation, it becomes an overwhelming task to attempt to *define* museums. Instead, this thesis uses an understanding of *museum as place* to explore the affordances they offer, the roles they perform, and how these understandings can be used to enhance the experience of museum as place for different stakeholders.

This section of the literature review is dedicated to establishing what roles museums perform and for whom - what physical affordances and constraints exist, what does a museum visit offer an individual, what barriers to engagement are embedded within them, and what tangible and intangible impacts do they have on their communities. It begins by establishing precisely what roles museums are expected to perform for their stakeholders and where those expectations originate. Once expectations have been established, we turn to an exploration of New Museology in order to examine how museums are evolving to address the changing priorities and expectations placed on them. I then explore the **visitors** and **audiences** themselves – who attends the museum, what we know about those who do not, and the realities of how a museum visit is experienced. I then explicitly introduce the power of museums and stakeholders to explore where barriers and opportunities for change might be found. Finally, I combine this understanding of *museums as place* and power to establish how museums can make room for themselves and their audiences to have a meaningful museum visiting experience.

2.3.1 The Roles and Affordances of Museums

Museums have been a central part of preserving and disseminating culture in Europe since the mid-17th century (Geoghegan, 2010). They are ‘amongst the most dynamic and resilient institutions in society’ (O'Neill, 2019: 1), they are a ‘robust, reflective, adaptive and ever-changing institution that evolves in parallel to the society in which stands’ (Murphy, 2019: 203) that provide numerous, well documented benefits to local communities and the general public alike (Dodd and Sandell, 2001). Western museums are also torpid, slow-moving, and controversial bastions of colonialism, taking from cultures and communities they do not explicitly serve and using these gains to teach their communities watered-down or incorrect narratives regarding cultures of the ‘other’ (Tolia-Kelly, 2016; Westwater, 2021; Aitchison, 2000). Not only does this undermine the educational motif of the museum, but it

perpetuates exclusionary behaviours both within the museum site and in the learned behaviours taken away with visitors. Where previous iterations of the museum-as-institution have benefited from displaying culturally appropriated content, contemporary shifts in attitude from local and international communities has begun the process of pressuring museums to change how they collect, curate, and display their content (Geoghegan, 2010). Where responses to calls for repatriation have been predictably slow, there are also significant changes happening within the cultural sphere that can be seen to reflect these changing priorities whilst still meeting the societal roles expected of it.

In tandem with evolving their practices to modes of contemporary curation that are aware of, and indeed even working to repair, the negative past of museums, museums are expected to perform other roles by government, funders, and audiences to provide and prove their societal value. For instance, museums are expected to offer insight and education on historic and contemporary issues both with obvious and hidden meaning to visitors. They are expected to provide ‘cultural capital’, the inherent transmission of culture, knowledge, and power (Bourdieu, 1973) between peers that can validate and enhance social status beyond the walls of the museum (Prentice et al., 1998; Robbins, 2005; Bourdieu, 1973). They are even expected to empower visitors to introspect on their life experiences and make positive, community-focused changes such as community cohesion, improved health, and scholastic education (Bardzell, 2010; Ruggiero et al., 2021; Mendoza, 2017; Morse, 2020). When museums are able to provide services, both physical and intangible, beyond the requisite act of displaying culture, they become capable of affecting their audiences and encouraging meaning-making on far more levels than might be perceived at face value:

...museums can inspire, educate, inform; they can promote creativity, broaden horizons and expose people to new ways of looking at the world, all of which have a relevance to discussions about the museum’s contribution to social inclusion. They also have the potential to deliver social outcomes less commonly assigned to museums - they can enhance individuals’ self-esteem, empower communities to take greater control over their lives, challenge stereotypes and tackle intolerance. Some of them can utilise their social impact to play a direct role in combating some

of the problems that disadvantage many diverse communities and individuals described by some as 'socially excluded' - poor health, crime, low educational attainment and unemployment. (Dodd and Sandell, 2001:

4)

However, the ways that museums encourage meaning-making through these incredibly valuable and meaningful properties are not experienced equally by all visitors. Cultural capital transmitted between peers requires historic literacy and resources that are typically only found within higher social class groups (Bourdieu, 1973), a legacy that can still be seen to exclude underrepresented groups from lower social or economic classes (Lynch, 2013; O'Neill, 2019). People from marginalised or minoritised groups are less likely to see themselves represented in the content and so lack the same incentive as other visitors to engage (Lynch, 2013; Hoffmann, 2020). Infrastructural disparities can prevent people from lower income backgrounds from physically accessing the museum or being within distance of outreach programmes. Even accessing and understanding content is rife with barriers surrounding education level, race, gender, sexuality, and (dis)ability (Gross and Pitts, 2015; Passebois and Aurier, 2004; Goulding, 2000). Such considerations are still often underrepresented in the literature surrounding access, skewing claims about the impact museums have on communities in favour of focussing on communities that already have access to cultural organisations. Even more concerning, this also keeps underrepresented groups from becoming more prominent and active cultural consumers. While such groups continue to be excluded from the narrative of the museum, the museum cannot hope to become a site of accessibility and inclusion in terms of either how they curate or who they represent.

To address these inequalities and to encourage the meaningful engagement required to meet the lofty goals of education, social inclusion and community cohesion, museums are increasingly 'inviting people to actively engage as cultural participants, not passive consumers' (Simon, 2010: i). Such action makes museums more capable of meaningfully engaging with the public, enhancing existing relationships with audiences, and increasing their relevance to others (Vermeeren and Calvi, 2019; Murphy, 2019; Ruggiero et al., 2021; Zollo et al., 2021; Mendoza, 2017). Other suggestions of ways to engage audiences include providing opportunities to engage with content at different stages (Gross and Pitts, 2015),

encouraging flexibility in levels of engagement (Falk, 2009), increasing interactivity (Zollo et al., 2021; Ruggiero et al., 2021) and facilitating discussion between different groups of actors with differing levels of expertise (Fosh et al., 2016). Whilst these modes of intervention offer exciting opportunities for different groups to find access points to the museum, they are not enough alone to undo the legacy of damaged trust that museums must work to overcome to fulfil their ascribed roles in more meaningful and wide-reaching ways. Indeed, museums are not enough alone to undo this legacy, and an important consistency to highlight from these suggested novel modes of interaction is in placing some level of trust on the audience themselves to contribute to this process. Museums must cede some of their power to allow and trust audiences to know their own needs, to find ways of meeting those needs, and to explore ways of conducting meaning-making that increases the relevance of the content to meet their own expectations (Ciolfi and McLoughlin, 2017), as well as continuing to work on evolving and growing as institutions.

Despite the barriers faced by audiences, non-audiences, and even museums to communicate and exchange culture meaningfully, museums continue to play a vital role in contemporary society. Their position at the forefront of culture, as arbiters, disseminators, and definers (Murphy, 2019) gives museums the power to make meaningful social change. For instance, museums have the power to choose how to represent contemporary topics and to decide who is involved in creating narratives and who gets to see them. They even choose the frames through which information is received and ultimately disseminated beyond the walls of their organisation. Museums are 'social and cultural barometer[s]' (Duncan, 2002: 102) that can demonstrate facets of the past, facilitate topics of the present, and capture existing contexts for the future. However, this power is not always wielded in expected ways. There is much discussion on the failure of some institutions to wield this power for positive social change, despite clear expectations to do so from museums themselves, governments, academics, and audiences alike (O'Neill, 2019; Benson and Cremin, 2019; Zollo et al., 2021). The United Kingdom (UK), for instance, are widely recognised for their strong advocacy of this goal, enabling museums to become sites for dialogue and debate and take advantage of their positions. In part, this falls to the role of the government Department for Digital, Culture, Media, and Sports (**DCMS**), who are specifically tasked to enable **UK** museums to become 'centres for social change' (Selwood,

2002: 15) through their funding and reporting goals. As Knell, Macleod, and Watson are cited as saying in Lynch (2013: 6) ‘...museums are not neutral spaces or ‘static cultural institutions’, but constantly changing and complex political entities shaped by the society in which they are situated, including the perspectives of their visitors’. As such, they contain the capacity to combat social injustice and offer alternative narratives to audiences that can platform marginalised voices and foster important discussions around how communities might develop. However, much of this responsibility for change still falls on the museums and their staff, which can lead to stagnancy and rejection of changes deemed ‘risky’ with organisations preferring to remain static, rely on the comfort of accepted narratives, and focus on consensus over providing space for resistance (Lynch, 2013; Duncan, 2002; Kidd, 2019). This torpidity is detrimental not only to the museum, but also to the communities they serve.

It is clear that whilst museums contain the capacity to be the ‘centres for social change’ they are expected to be, there are still barriers that prevent them from meeting these expectations. In recognition of this, museums are increasingly turning to concepts of New Museology as a starting point for understanding their evolving role in a changing world.

2.3.2 How New Museology is Changing Museums

New Museology was a paradigm shift for museum studies that emerged in the late 1980s in response to the changing societal roles and requirements of museums (Geoghegan, 2010). It concentrated on shifting the focus of museum studies from the methods museums apply to their work to the purpose of museums themselves (Vergo, 1997). As part of this shift in focus, it introduced feminist, postcolonial, and social history as lenses through which to understand the museum and by the early 1990s had caused dramatic changes to how many museums curated and displayed their content (Geoghegan, 2010). These changes pushed the thought process behind curation in museums from positivist, collection-centred curation, to constructivist, audience-centred experiences (Recupero et al., 2019; Eklund, 2020; Howes, 2015; Passebois and Aurier, 2004; Kidd, 2011). By placing the audience experience at the centre of museum purpose, New Museology principles enabled visitors to become *active participants* within the museum, rather than simply passive consumers (Simon, 2010; Eklund, 2020; Murphy, 2019; Kidd, 2018). In order to accommodate this, many museums turned, and indeed are increasingly turning to interactive, technology-

driven elements within their sites that encourage visitors to engage with content in deeper and more personal ways than traditional offerings like signposting might enable (Howes, 2015; Recupero et al., 2019; Eklund, 2020; Murphy, 2019; Kidd, 2018). By redefining the visitor as an active participant and recognising them as individuals with complex needs, space is created to accommodate the wealth of influences and meaning-making practices a visitor brings with them such as their history, identity, and previous experiences (Eklund, 2020). This enables the visitor to not only connect with content more meaningfully, but also empowers them to interpret, re-interpret, and take meaning away with them and back into their personal lives and communities. However, recognising the individuality of the visitor also means recognising the barriers that harm the visitor, and giving voice to the unique meanings that are ascribed by different people.

As part of the process of centring the audience (and de-centring the museum), New Museology calls for museums to cede aspects of power traditionally controlled by the institution by presenting multiple perspectives regarding their content:

Central to this change is the recognition of information as a basic and shared museum resource. The peculiar qualities of information allow it to penetrate physical walls and thus to foster closer links among parts of the museum, and closer contact with the outside world. (Stam, 1993: 280)

These multiple perspectives are no longer confined to the voices of ‘experts’, but indeed can platform the voice of visitors themselves (Darzentas et al., 2022; Stam, 1993; Murphy, 2019; Petrelli et al., 2016; Kidd, 2011; Kidd, 2018). This is a vital way to not only reduce the ‘power implied in the ownership by museums of objects wrested from disadvantaged individuals or peoples’ (Stam, 1993: 270), but also to acknowledge the fallibility of discourse assigned to an object as ‘objective’ or ‘true’ (Taborsky, 1990; Benson and Cremin, 2019). The meaning given in traditional curation to objects is subjective and rooted in society and culture as much as any other form of knowledge (Foucault, 1980) and providing opportunities to intellectually engage with artefacts and objects in order to root them in contemporary understanding is vital to meaning-making for visitors (Stam, 1993; Taborsky, 1990) and therefore to New Museology principles. As such, to achieve an audience capable of engaging with, interpreting, and sharing the meanings forged within museums, museums

must continue their work to better create this space of transparency and mutuality. They must integrate internal information, provide wider access for staff and public to institutional data, draw more deeply from sources that reveal the context of objects, and prepare more sensitively for relating to the community at large (Stam, 1993).

2.3.3 Museum Visitors – Who, What, and Why

Following the shifting focus of museums to audience-centricity, there has been much work in the field of Museology to determine who the audiences of a museum are, why they attend museums, and what they do while there. One popular way of understanding how motivations and behaviours co-exhibit emerged as ‘personas’ (Antonioni et al., 2016; Prentice et al., 1998). Personas categorise visitors based on different factors. The most influential of these personas were those developed from John Falk’s work on museum visitors that creates seven persona types based on motivation and identity markers (Falk and Dierking, 2016; Falk, 2009; Falk, 2011; Falk, 2016). These personas are; Explorers, Facilitators, Experience Seekers, Professional/Hobbyists, Rechargers, Respectful Pilgrims, and Affinity Seekers. Personas can be helpful in scenarios where visitors need to be understood quickly and where nuance is less important (Kuflik et al., 2012; Moffat, 2019). I acknowledge the important role that this model has played for Museology and museums, and even within this thesis, as a starting point to engaging with motivation and identity as central to visitor behaviours. However, I found the application of personas to be limiting when considered through the framework generated as reductive of the individual experiences of *museums as place*, and apathetic to the systemic power embedded in the museum. Instead, I build on the vast canon of Falk’s work to explore motivation and identity from a phenomenological and experiential perspective, wherein the individual themselves is empowered to find their own meaning fluidly, utilising their identities and motivations to curate their personal data and thereby their experience

Who visits museums is one of the more documented questions presented within academic and industry literature. In the 1980s, the **UK** government shifted to relying more heavily on quantitative data to measure the impact of the cultural sector on its audiences (Caldwell, 2002; Murphy, 2019). To meet government requirements, museums developed the types of questionnaires and surveys that dominate museum data collection to this day. For this reason, it is relatively simple to detail an overview of who visits museums. Average museum

visitors in the **UK** have a high education level, higher than average income level, are female, and are over the age of 40 (Falk, 2009; Falk, 1993; O'Neill, 2019), although more contemporary reports suggest that young people between the ages of 19-29 are starting to overtake 40+ demographics (Zollo et al., 2021; Easson and Leask, 2020). Further, in 2015 the Warwick Commission report showed that 87% of museum visitors in the **UK** were from 'higher level' social groups (O'Neill, 2019). We can see, then, that 'rather than functioning as institutions of mass public education, fostering individual growth and active citizenship, most museums serve those who are already educated' (O'Neill, 2019: 4). As such, it becomes apparent that museums are not successfully tackling the barriers that bar marginalised groups from access.

The intense bias of who attends museums demonstrates deeply ingrained, structural barriers that prevent certain groups from being able to engage with cultural organisations and highlights the stigmas assigned to traditional museums that have made them unappealing to audiences outside of their core demographics. Criticisms of elitism (Mason and McCarthy, 2006), exclusivity (Galloway and Dunlop, 2007), enforcing alienation (Gross and Pitts, 2015), perpetuating colonial narratives (Gregory, 2004; Vergo, 1997), and becoming 'consumer oriented' over 'content oriented' (Passebois and Aurier, 2004) all contribute to more restricted numbers and less diversity of visitors. Audiences who do not feel represented within these institutions can struggle to find an access point to museum-based cultural content, choosing instead to engage with more technology driven (Allen and Petterson, 2016), 'edutainment' style (Vermeeren and Calvi, 2019), personally relevant cultural media; or even choosing not to engage with museums and the arts at all. Often, these limitations are most strongly felt by communities already experiencing marginalisation, for example people of colour, (dis)abled people, or members of the LGBTQ+ community (Coleman, 2018). For many, these embodied and historical barriers make the difference between repeated engagement with museums or internalising that arts and culture are not a space in which the potential visitors belong.

Motivations of visitors are trickier to document, and results usually come from academic research rather than governmental or museum statistics. Some people visit museums alone as the museum can act as an 'escape' from the realities of day-to-day life (Falk, 2009; Goulding, 2000). More often than not, however, people visit museums as a social affair

(Falk, 2009; Goulding, 2000; Eklund, 2020; Fosh et al., 2016) in which they attend with a group of peers both as a status symbol, and as a means to generate conversational topics. Education, entertainment, memory creation, identity affirmation, leisure, relaxation, new experiences, and social status (Prentice et al., 1998; Recupero et al., 2019; Falk, 2009; Eklund, 2020; Murphy, 2019; Petrelli et al., 2016) are all forms of meaning-making that occur during a museum visit and all drive visitors to attend museums. Interestingly, Prentice et al. (1998) note in their study of visitors to *Discovery*, Dundee, Scotland, that despite gender, ethnicity, social class, and education level directly impacting *who* attends the museum, such factors did not affect the motivation of visitors to go, nor to engage with content whilst there. This is confirmed further in research by Goulding (2000) at the Birmingham Museum and Art Gallery. The study shows that exhibits specifically tailored to appeal to certain demographic groups, for example 'A Meeting Ground of Cultures' aimed at Asian and African-Caribbean visitors were least likely to attract visitors from those demographics. This makes it clear that simply showing content from different communities is not enough to appeal to different communities, and confirms that visitors attend museums with their own knowledge, understanding, needs, expectations, and motivations (Falk and Dierking, 2016), all of which influence a decision to attend, or re-attend, a museum.

Data on what visitors do when they attend a museum is most commonly presented as a top-down, researcher-centric view of visitor activities. Data relating to the behaviour of visitors onsite is highly prized by museums as elusive but valuable (Carnwath and Brown, 2014). We know from academic research that museums are highly social experiences (Barron and Leask, 2017; Goulding, 2000; vom Lehn and Heath, 2016; Eklund, 2020), which visitors attend to explore and refine their identities and knowledge through the activities and micropractices conducted on site (Falk and Dierking, 2016). Many behaviours conducted are relatively ubiquitous across museum experiences, before, during, and after the visit (Falk and Dierking, 2016), constrained or empowered as they might be by the physical and metaphysical museum space (Geoghegan, 2010). The museum itself sets the scene for the visit, it directs people to navigate in certain ways through routing and mapping, and offers the staging for which numerous visitors interact at any given time (Goulding, 2000). Indeed, the ways in which the museum as space and museum as place affect visitor behaviours are

countless and deeply contextual of the physical space, the content, the intentions of the designers, provision of relevant information and so forth (Geoghegan, 2010; Ciolfi and Bannon, 2007; Barron and Leask, 2017).

Prior to their visit, people may engage in preparation; anticipating relevance, talking to peers to gather information about the museum or exhibit content, planning routes to travel there, organising schedules amongst the people attending, potentially even saving money to pay for entrance fees (Vermeeren and Calvi, 2019). On site, people organise in different ways to engage with content according to personal or group needs, personalities, preferences and priorities, and so on. Eklund (2020) found four key ways that people engaged with content in the museum – through recontextualisation such as humour or contemporary references, through play, through physicality, and through navigation.

Recontextualisation, play, physicality, and navigation are inherently intertwined with one another, but each offer important meaning-making behaviours highly dependent on visitor dynamics, museum atmosphere, and exhibit content. For instance, in navigating the museum, some visitors may choose to split up from their group, navigating different exhibits, rooms, and spaces alone before returning to their peers at differing points to regroup and prepare to transition to the next phase of their visit. Some groups may attend and stay close to one another, moving from exhibit to exhibit as a unit, discussing or highlighting points of interest as they go. In either case, visitors use physicality to draw or divert attention, to indicate interest or boredom, and to encourage behaviours like play and recontextualisation. For example, group members may indicate to each other through non-verbal gestures and looks that it is time to move on from exhibits (vom Lehn and Heath, 2016), even before each individual has finished their engagement (Eklund, 2020). It is for the same reason that reading complex or lengthy signage in museums is an inefficient way of communicating information, as reading is a primarily solo activity and thus is not conducive to the social dynamics of a typical museum visit (Vom Lehn and Heath, 2016; Barron and Leask, 2017). Alternatively, group members may encourage play as a means to maintain energy levels and maintain or re-establish cohesion. In their ethnographic study of a videogame museum, in which play was central to engagement with exhibits, (Spors et al., 2020) found that visitors go through preparation, play, wind down, and exit phases in which a combination of body language and verbal communication enable visitors to meaningfully

engage with exhibits and each other as cohesive, social units or as solo experiences. Indeed, many scholars such as Spors et al. (2020) and vom Lehn and Heath (2016) advocate for shifting from non-interactive, written information delivery systems for precisely this reason.

Upon reaching the end of the visit, whether that be defined by amount of content, attention span of group members, time restrictions, or some other personal metric by which the visit may be considered concluded, visitors may choose to attend the café or gift shop in order to discuss and reflect on the contents seen. Others may choose to do so as a mental or physical break mid-way through their visit, and others still may forego this activity all together.

Visitors may post photographs and thoughts to social media to reflect upon and prompt further conversation with peers who may not have been present (Spors et al., 2020; Zollo et al., 2021; Ruggiero et al., 2021), , which is shown to increase loyalty, probability of re-visiting, and financially supporting the organisation (Zollo et al., 2021; Petrelli et al., 2016), as well as engaging in other reflective forms of embedding knowledge and meaning-making such as further reading, or revisiting the museum (Barron and Leask, 2017; Recupero et al., 2019).

Lack of non-academic behavioural data on visitors stems from a combination of governmental and funder requirements centring on quantitative data, and financial limitations in implementing infrastructural changes needed for more qualitative data collection. Despite this focus on quantitative and statistical data, there is a growing call for museums to revert to collecting qualitative data in order to better capture the intangible, intrinsic, impactful roles of museums and to better prove the cultural and individual value of such institutions (O'Neill, 2019; Murphy, 2019; Caldwell, 2002; Fleming, 2009; Selwood, 2002).

Despite the homogeneity of origin, there is much insight to be found from the academic canon regarding the behaviours and activities of museum visitors. Traditionally, museums have been viewed as a physical location where people go to learn (Mason and McCarthy, 2006; Prentice et al., 1998; Eklund, 2020; O'Neill, 2019; Benson and Cremin, 2019; Murphy, 2019; Recupero et al., 2019; Barron and Leask, 2017). However, learning within the museum is not restricted to content, but extends to learning about others (Dodd and Sandell, 2001; Lynch, 2013), learning new skills (Lynch, 2013), and visitors learning about themselves (Eklund, 2020; O'Neill, 2019; Goulding, 2000). Researchers and practitioners also advocate

that when people visit museums, they actively and passively engage in activities that promote higher self-esteem (Dodd and Sandell, 2001), closer social and community connections (Prentice et al., 1998; Eklund, 2020; Benson and Cremin, 2019; Recupero et al., 2019; vom Lehn and Heath, 2016; Goulding, 2000; Barron and Leask, 2017), and deepened empathy toward others (O'Neill, 2019; Benson and Cremin, 2019). Often, these things are achieved through a combination of traditional learning and more contemporary forms of engagement aimed at play, fun, and exploration (Vermeeren and Calvi, 2019; Eklund, 2020; Murphy, 2019; Recupero et al., 2019; Barron and Leask, 2017; Zollo et al., 2021). Increasingly, this includes interacting with technologies such as interactive displays, augmented guides, and even taking selfies (Barron and Leask, 2017; Weilenmann et al., 2013). Other important activities undertaken include visiting the gift shop and café (Association of Independent Museums, 2019; Collins et al., 2015) and soaking in the general atmosphere (Prentice et al., 1998; Eklund, 2020; Zollo et al., 2021).

The vast array of motivations, behaviours, and identities described here suggest that as museums move to new ways of engaging with visitors, it becomes less important to accommodate multiple different 'types' of visitors, and more important to empower the visitor themselves to find the meaning they seek in their own way (Jones, 2015; Scott et al., 2014; Eklund, 2020). As established, meaning-making is a core part of the museum visiting experience, and technological interventions can offer powerful ways to put the power of interpretation and meaning-making back in the hands of the visitor (Eklund, 2020).

2.3.4 The Power of Museums and their Stakeholders

As shown, much existing knowledge about audiences stems from museum, government, or academic analysis. Further still, much of the existing data collection practices are driven by or for those who fund the museums. The relationships between different stakeholders in the museum are therefore beginning to emerge, with funders being shown to be an important influence in the ways museums exist. This is also reflected in the power funders can hold over museum and audience actions and experiences. For instance, the micropractices (as defined by Foucault in 2.2) experienced within museums are often defined by funders, perpetuated by museums, and experienced by visitors. However, there is space within these categories for crossover and bleeding, such as micropractices brought into the museum space by audiences, or the museum defining what 'truths' they wish to

perpetuate. The power of museums originate in their position at the forefront of culture (Duncan, 2002; Murphy, 2019). Museums contain the power to define cultural norms and narratives that are disseminated throughout society (Murphy, 2019), to educate audiences on their rights and abilities as citizens, to frame the ways that knowledge is disseminated, and to encourage critical thinking (Dodd and Sandell, 2001; Simon, 2010; Bardzell, 2010). The power of funders largely stems from their ability to dictate how funds can be managed, as well as the rights granted to them by museums and audiences to dictate what is shown and how in return for their financial support. Audience power is less visible, although equally as important to understand and, with the broad adoption of New Museology principles, increasing. Audiences are capable of observing the information shared with them via the cultural institutions they visit, absorbing it through the lens of their own experiences, and then going on to apply and disseminate that knowledge in the wider world (Vermeeren and Calvi, 2019). Empowering visitors and potential visitors to engage with content in ways more meaningful to them encourages a deeper and longer lasting understanding of the vital knowledge shared by cultural institutions (Dodd and Sandell, 2001; Eklund, 2020).

Power within museum sites is primarily wielded by the museum themselves as they are able to dictate the canonical truths and acceptable micropractices experienced or performed by audiences. However, we must not forget to acknowledge the power that audiences have, even if it is covert or hidden. As we have established, power can be understood as something that generates *resistance* (Weber, 2011), and as such, we can see resistance as not only a result of power, but also as a kind of power itself that is resisted by the dominant hegemony. Further still, the definition of power as detailed in 2.2 shows that power can also be communicative and evaluative as it stems from social interpretations of overt and covert expectations (Barnes, 1984; Barnes, 1992) and in particular from the discourses that underpin those expectations (Foucault, 2016; Foucault, 2000; Foucault, 1980). As such, resistance of these expectations and discourses is a form of power in itself as it evaluates existing structures, communicates discontent, and formulates new discourses of rejection. Such resistance can be explosive – strikes, protests, and riots are clear examples of people resisting power structures and calling for change (Scott, 1985). However, everyday acts of resistance are also powerful, if often less visible, calls for change that are enacted on a much more regular basis by ‘ordinary’ people (Johansson and Vinthagen, 2016; Vinthagen and

Johansson, 2013; Lilja et al., 2017). Everyday resistance is exactly as it sounds – resistance enacted in the everyday. The ways that everyday resistance can be enacted are endless, from mocking people in higher social roles behind their back (Vinthagen and Johansson, 2013), speaking candidly about (perceived) injustice (Lilja et al., 2017), or even simply walking across the grass instead of using designated paths (Fleming, 2009). Importantly, however, as scholars turn their attention in recent years to resistance studies, it becomes increasingly clear that resistance is historically, socially, economically, politically, and even temporally, highly contextual (Lilja et al., 2017; Bourdieu, 1998; Vinthagen and Johansson, 2013; Hall, 2015; Turiel, 2003; Scott, 1985; Foucault, 2016). Even more, everyday resistance is most often seen within groups who are marginalised, and as such have more reason to resist (Hall, 2015). As museums continue to develop towards being spaces of audience-driven education and change, the importance of opening such spaces of resistance to all communities becomes more pressing than ever.

Despite the acknowledgement amongst resistance scholars that resistance is a necessary companion to power and regardless of the power that museums wield and the discourses that they shape and perpetuate, I could find no research that is explicit to the ways that people enact everyday resistance in the museum setting. However, with the growing interest in museums as a space of activism and change (Lynch, 2017; O'Neill, 2019; Benson and Cremin, 2019), exploring how audiences make sense of power and resist it in mundane and non-invasive ways has much to contribute to our understanding of *museums as place*, *technology as mediator*, and *relational personal data*. By integrating an understanding of everyday resistance into the conceptual framework, it becomes possible to facilitate these acts in such a way as to ensure the audience is having their unmet needs realised and to create space for marginalised peoples to access the space, whilst still allowing museums to continue their goals of education and social change. One promising avenue to achieve this is integrating modes of co-creation within the organisation (Murphy, 2019; Darzentas et al., 2022). Co-creation explicitly relies on the unmet needs of audiences and the ways they choose to understand and use the museum (e.g. through practices of everyday resistance) as a feature of manifested change. As audiences increasingly look for more participatory experiences in which they are able to impact their own experiences according to their

personal, cultural, and social values (Easson and Leask, 2020), museums look for ways to assist this demand using co-creative practice.

2.3.5 How Meaning-Making, Loyalty, and Trust Affect Museum-Visitor Relationships

Creating spaces that can empower visitors and audiences to become active participants in the museum is, as detailed, one way that museums are continuing to evolve to reflect the society within which they are situated. So far, this review has detailed the roles and affordances of museums, the changes instigated by New Museology, and who these changes and roles affect. Now, we turn our attention to understanding *why* these changes are sought after and what the short- and long-term effects are understood to be. This section looks explicitly at relationships between museums and audiences, both existing and desired. More specifically, I investigate the role of trust in such a relationship, how it generates loyalty, and the positive outcomes loyalty can offer. More, I also explore how trust creates different opportunities for meaning-making both in and out of the museum.

Most museums in the **UK** are not-for-profit organisations (**NPOs**) (Mendoza, 2017) whose public funding largely originates from 16 sources including the **Arts Councils**, the **DCMS**, the National Lottery Heritage Fund, local governments, and Universities (Mendoza, 2017). Data collected for these funding and governing bodies is used for a broad range of reasons; from national level policy-making, to trend monitoring, to individual development (Arts Council England, 2017). However, data collection in museums is sporadic, methodologically flawed, and often falls wide of the mark of what is trying to be captured and understood (Selwood, 2002; Shone, 2017). For instance, little attention is paid to the emotional and experiential elements of a museum visit that have, arguably, the most important impact on the lives of its visitors (Caldwell, 2002; Easson and Leask, 2020; Carnwath and Brown, 2014). This is partially because of a long history of governing bodies favouring 'objective', digestible, quantitative data sets (Selwood, 2002; Murphy, 2019; Caldwell, 2002); partially because of the complexity and lack of resources to collect the data; and partially because in order to utilise data collected, there must be (often expensive or resource intensive) infrastructure in place to make sense of the data (Birch et al., 2021). As a result, quantifiable impact has overtaken the intrinsic value of cultural institutions as measures of success (Selwood, 2002; Caldwell, 2002).

Quantitative datasets generated are subsequently the only measures available of museum 'success'. To receive public funding, museums must provide evidence that shows this success in the context of continuous growth, for instance increasing visitor attendance and spend in cafés and gift shops (Caldwell, 2002). However, the metrics used to capture these trends are unable to capture intangible elements of growth such as education levels, community cohesion, and other valuable measures described above. Nor do they illuminate important elements of stagnancy such as who is missing from the audience base or why. This missing data has unrecognised, inherent value to funders that is arguably even more important than figures exclusively focussed on income and popularity (Barron and Leask, 2017; McIntyre, 2010; Kovach, 2014; Komarac et al., 2019). For instance, Passebois and Aurier (2004) point out that museums have to conduct their education over a long period of time as visitors must become more familiar with the concepts on display in order to understand and fully engage with them. Repeat engagement from the same visitors not only shows that the museum is effectively enabling meaning-making and learning, but is also vital to the work that museums do in outreach and pastoral care (Vermeeren and Calvi, 2019; Barron and Leask, 2017). However, repeat engagement is rarely able to be seen amongst raw data regarding visitor figures, and so the value of long-term relationships remains unrecognised by funders.

Private funding is also becoming an increasingly common resource for museums in the face of ever-declining public funding. In recognition of this, some researchers recommend museums should focus their efforts on building personal and meaningful relationships with funders over those with visitors (MacMillan et al., 2005). Trust generated within long-term relationships with funders can provide economic stability during economic instability, long-term financial success, novel innovations and problem solving, and increased intellectual capital (MacMillan et al., 2005). However, the increasing uptake of New Museology principles of centring the audience suggests that audience relationships should take precedence over funder relationships, and that building loyalty with an increasingly diverse audience base should be prioritised.

In response to the lack of recognition of the meaningfulness of long-term relationships between audiences and museums, Passebois and Aurier (2004: 79) developed 'the logical chain of relationships marketing'. The model explains what criteria must be met for a

relationship to form between visitor and museum, and does so in synchronicity with the different elements of *museums as place* explored above. The chain begins with perceived quality. This is defined as the perceived quality of factors including the exhibit (content), interactions (staff, learning aids), and physical environment (ambiance, visitor traffic, architecture). The second link in the chain is perceived value, defined as an aggregate evaluation of the relationship between the consumer and the product. These first two links offer insight towards the impact that the motivations and identities of visitors have on their museum experiences, as it shows what initial touchpoints visitors engage with to begin their own process of meaning-making, as well as what they might be looking for in these interactions. Vitally, the links also highlight the initial barriers that may prevent engagement where early perceptions of the museum might suggest that it does not meet the needs of certain groups. The third link is cumulative satisfaction, or 'where reality is congruent with or exceeds expectations' (Passebois and Aurier, 2004: 83), which is defined by the authors as enchantment or surprise and reflects both the affordances of the museum, and the efforts of audiences to find meaning in their visits. This is the element that directly precedes and provides the foundation for trust. Trust has emerged as a vital resource for museums throughout this thesis in terms of the affordances granted museums deemed trustworthy and in terms of its direct impact on inclusivity and engagement. **NPOs** are often assigned different values by patrons than their for-profit counterparts including higher levels of trust regarding knowledge, decision-making, and altruistic motivations (Lourenço et al., 2020; Bhattacharjee et al., 2017). Museums are no different, and should the museum meet the expectations and needs of the visitors in the preceding links, then trust can develop into something more personal, capable of forging the final link of commitment. Commitment is defined as maintaining a valued relationship, and derives from identification with the values and goals of the organisation as they have been understood through quality, value, satisfaction, and trust. When all of these criteria are met, long-term loyalty is established between the museum and the visitor. Long-term loyalty then provides the necessary relationship to continue education and meaning-making opportunities in ways impactful to the individual visitor (Petrelli et al., 2016).

This model provides insight into how the different elements of a museum visit combine together, however, it does so with limited consideration of the barriers at each stage that

can *break* a relationship, or even prevent it from being forged. However, there is evidence that when long term loyalty is established as a priority, the museum is more able to attract the attention of new and non-typical visitors, enabling them to educate and entertain their communities on an even broader scale (Murphy, 2019; Benson and Cremin, 2019; Lynch, 2013).

2.4 The Use of Technology and Personal Data in Museums

Technologies have long been adopted by museums to enhance their ability to reach out to potential visitors and provide engaging content (Petrelli and O'Brien, 2018). Precisely how technologies have been implemented is as varied as the sites themselves, ranging from interactive content, to community archives, to immersive spaces and more. The roles that technologies play in the museum are also complex, but predominantly examples can be separated into technologies to enhance content, and technologies to enhance accessibility and inclusivity. However, with technologies continuing to evolve at an exceptionally fast rate, researchers and practitioners are still only just beginning to explore how future museum visits will be experienced. One such possibility for future development is in technologies that are capable of collecting, processing, storing, and analysing personal data from audiences that can then be used to address the limitations, gaps, and concerns explored in 2.1. For instance, easier access to data about visitors can make it possible to respond to the needs of visitors, and even make it easier to identify missing communities. However, personal data is a volatile resource, and one which legislation in the **UK** is struggling to keep secure. Equally importantly, personal data is currently used in ways that almost exclusively benefit the data holder, in this case museums and their funders, and provide little discernible benefit to audiences themselves.

This section of the literature review presents an overview of the current roles of technology and personal data in the museum, highlighting the power of both, and the risks and opportunities they offer to museums and audiences alike. I then draw on literature surrounding *gifting*, to explore how technology and personal data might meet in the museum space to contribute to the creation of meaningful relationships as detailed in 2.3.5. As part of this exploration, I include considerations highlighted in the sections above, particularly the importance of *museums as place* – drawing on the roles of museums and the needs of audiences to consider the effectiveness of museum technologies. To achieve

this, the section draws inspiration from the work of Ciolfi and Bannon (2007), who also explicitly integrate place as a framework to explore museums, specifically in regards to altering them through the implementation of technologies. Building on the work of Geographer Yi Fi Tuan, they integrate his four elements of place (physical, personal, social, cultural) into their design framework to ensure that their project works *with* the museum as place, and does not simply exist *within* the museum space.

2.4.1 The Power of Technology

Technology contains multitudinous kinds of power in the ways that it fundamentally shapes the space it occupies by mediating how bodies within that space enact and experience rules, beliefs, rituals, discourses, and power dynamics (Bardzell, 2010; Barnes, 1984; Foucault, 2000). Understanding how technology shapes such aspects of life is vital to understanding how best to utilise technology in such spaces. Further, meaningful implementation of technologies requires acknowledgement that it may have far reaching social consequences beyond the intention of the designer, and that effort needs to be put in politically, culturally, and institutionally to make sure those consequences align with societal values and subjectivities (Macnaghten et al., 2015).

Many times over recent years, emerging technologies have been shown to disregard societal values in their design, implementation, and/or use. This has been particularly of note to women or minority genders; Black, Asian, and other ethnic minorities; and people with disabilities (Rode, 2011; Fox et al., 2017; Bardzell and Bardzell, 2016; Bardzell, 2010; Vorvoreanu et al., 2019; Taylor, 2017). Important to note as well is the more marginalised groups a person belongs to, the more likely they are to be exposed to forms of data misuse and even data violence such as data surveillance, or 'dataveillance' (Taylor, 2017). This is covered extensively in a paper by (Taylor, 2017) that explores the impact of data-driven discrimination on groups of vulnerable or minoritised peoples, for example the disproportionate impact of systems designed to combat 'benefit fraud' on (dis)abled people. Taylor (2017) also gives examples of data-driven law enforcement algorithms targeting poor and ethnic minority communities, movement tracking of undocumented migrants, and the prevention of access to gender-affirming healthcare. As such, embedding different narratives and perspectives in the design of a technology is one option to minimise the risk of incidental misuse, although deliberate acts of data violence are harder to navigate.

Further still, existing discourses around technology can often be so utopic that important questions around the very nature of the problem being addressed are overlooked. There is oftentimes a misplaced belief from all stakeholders, including researchers, that technology can provide the answers to all difficult social problems:

*In the words of VC Marc Andreessen, “software is eating the world”.
Technological solutions move the world forward, solving old problems
while often creating new ones. The inexorable advance of software
solutions for every conceivable function is evidence of the triumphs of
reason and rationality. (Sicart and Shklovski, 2020: 1859)*

This concept of ‘technosolutionism’ is particularly problematic when viewed with the knowledge of technology working against the most vulnerable or in-need populations (Lindtner et al., 2016). An important way to combat technosolutionism is to include the voices of the populations affected by the technology in the design process. For example, women in STEM (science, technology, engineering, and maths) industries continues to be a frequently parroted mantra, but one which has seen little progress in terms of actually making space for women to flourish in STEM environments. This has led to the generation of what Bardzell (2010) terms the ‘digital divide’. The digital divide describes the lack of women in science-led spaces, and thus in the design processes of technologies that are ‘embedded in the production and ongoing management of gender in daily life’ (Rode, 2011: 393). However, the digital divide is also visible for all of the groups described here to the detriment of technological progress.

An important step for combating the multiple digital divides present in the design and use of technology is, in line with New Museology principles, platforming and empowering different voices throughout all stages of the design process (Bardzell, 2010; Vorvoreanu et al., 2019). By involving different stakeholders and perspectives in modes of co-creation, it becomes possible to understand public processes involved in the sense- and meaning-making of technology (Macnaghten et al., 2015; de Souza e Silva, 2016) and therefore reduce the hidden biases embedded in technology (Vorvoreanu et al., 2019). Macnaghten et al., (2015: 509) identified five concerns that played a key role in determining public attitude to new technologies, and therefore incorporating their needs into design:

- Purpose of emerging tech
- Trustworthiness of those involved
- Inclusion and agency of the public
- Speed and direction of innovation
- Equity

These concerns commonly emerged in Macnaghten et al's (2015)'s meta-analysis of public dialogues on emerging technology, and the answers to these concerns (as perceived by the public) were core to the decision of how acceptable a technology was. These concerns are not mutually exclusive from one another in practice and all five themes were necessary to address in each evaluation.

Specifically within the context of museums, technology is often used to enhance exhibits and increase engagement. It facilitates participation in museums through audio guides, social media, and interactive displays that encourage self-directed or peer-directed learning. It can even be demonstrated that personalisation of content through the use of technologies increases loyalty and long-term engagement (Zollo et al., 2021). Enabling interactivity without the direct interference of the museum has created space for new means of interpretation and dissemination. For example, projects like *Ugly Renaissance Babies* or *Nipples at the Met* offer novel interpretations of exhibits with more broad-reaching impact due to their virality than traditional interpretations (Murphy, 2019). Other technologies like Augmented Reality (**AR**) and Virtual Reality (**VR**) that superimpose or replace the physical world with virtual content also offer interesting ways to play with power in museums, such as *All Hail Damien Hirst* which uses **AR** at the Tate to change the way that Hirst's paintings are viewed (Murphy, 2019), or *One Rock* which allows access to different perspectives of a large rock in Morecambe Bay, **UK**, from micro to macro that visitors would not otherwise be able to access (Reeves et al., 2018). **AR** and **VR** aims to make a convergent environment that cannot necessarily be controlled by the museum or the artist. It offers potential disruption, but also offers new ways of engagement and interpretation. Therefore, visitors no longer just have to interpret, reinterpret and engage with museum spaces through the controlled lens of the museum:

This invitation to participate can be viewed as a radical approach to involvement since the openness of the invitation lays the foundation for what Kidd calls both 'tyrannical' and 'chaotic' storytelling, by which she means storytelling that is not constructed within the physical or ideological confines of the museums; instead it can be distributed by content creators through social media platforms, without requiring permission of a museum. (Murphy, 2019: 210 - 211)

Whilst such technologies within the museum offer novelty and empowerment to engage with meaning-making in non-traditional ways, this 'gamification' of culture too comes with risks of obfuscating power structures further instead of making them more transparent and equitable (Sicart and Shklovski, 2020).

This exploration of the power of *technology as mediator* shows how, when poorly wielded, technology can be used to exploit or damage the communities it pertains to serve. However, it is also shown that by hearing and addressing the potential concerns of stakeholders and directly involving them in the design process, and by using technology as a mediator to empower the user to engage critically with content, technologies can be an effective way of re-empowering different groups. With the help of technology, museums can therefore become valuable and active places that can be used - not just visited (Murphy, 2019).

2.4.2 Previous Examples of Technology Interventions in Museums

In an effort to understand the potential applications of technology in cultural spaces such as museums, this part of the review explores examples of technological interventions that have been tested before. By doing so, we explore different elements of museum visits that can be targeted by technology, and evaluate the successful and unsuccessful elements of different intervention types and look for gaps that can be addressed in the empirical research.

Digital archiving is a common practice that allows museums to not only monitor their content (both on display and in storage) but also to allow audiences to engage with content they may not otherwise get to see. In more recent years, it has developed to accommodate, for example, visitors becoming involved in tagging and mapping objects (Zeng and Zhang, 2017; Carletti, 2014; Coughlan et al., 2015; Geismar and Mohns, 2011). Geismar and Mohns (2011) discuss the impact of the Vanuatu Cultural Centre museum opening a relational

database that allows audiences to contribute tags to the museum archives in order to empower audiences to build their own connections between objects, people, and places. The study found that the audience-led curation was highly effective at re-contextualising the museum content within the communities it represents and affects. Along similar lines, Art Maps is a web platform that allows participants to explore relationships between art, location, and memories (of both user and artist) based on the digitised collections of Tate, a **UK** based gallery brand (Coughlan et al., 2015; Price, 2012; Carletti, 2014; Sinker et al., 2013). The project encourages deeper online engagement with content that is not displayed, and supports critical interaction between art and audiences, and audiences and audiences (Coughlan et al., 2015).

Traditional museum offerings are also changing due to the increasing availability of personal devices and internet access. Augmented guidebooks and tours, either on museum devices or downloaded to visitors' phones, are well-established examples that augment or replace human guides with more consistently available audio or visual information (Sung et al., 2010). Initially, many of these interventions were criticised for distracting visitors and taking away from the physicality of the museum. However, as interactive technologies progress and adapt, these limitations are being mitigated in novel ways such as using **AR** for treasure hunts and location based audio triggers that encourage deeper interaction with content (Sung et al., 2010; Fraser et al., 2004; Reid et al., 2005), or using radio frequency tags to project content onto urban cityscapes (Kidd, 2019).

Photographing exhibits and experience within the museum is also a popular and important part of the visit for many visitors to reminisce or tell stories related to the visit (Weilenmann et al., 2013). Photographs are understood as 'a means for creating an impression of a moment in time and integral to practices of memory and reflection' (Durrant et al., 2011: 1767). They are important for pre- and post-visit interpretation and meaning-making. Even early in the timeline of smart phones, museums and researchers were exploring the potential of sharing photographs as a way to encourage visitors to share personal interpretations. One example came from work by Taxén and Frécon (2005) who gave visitors the opportunity to share photographs and personal comments via text message to a virtual display in a museum exhibit. While not well engaged with at the time, the evolution of Wi-Fi and mobile internet coverage makes such an early innovation far more relevant in

contemporary times, as demonstrated by researchers and practitioners revisiting these modes of interaction. For example, Automics was an app created by Durrant et al., (2011) as a means to let people share photos taken on a day out at a theme park with other members of the social group. Providing visitors the ability to comment on, revisit, and re-interpret events from the day was valuable to the users in terms of solidifying specific moments and fostering long-term meaning-making. Enabling and even encouraging photography within cultural sites is therefore shown to be an effective way of engaging visitors in their own curation and interpretation of content and events, re-categorising and re-curating their visits in order to create their own narratives. It also extends the reach of the site beyond the physical location in creative ways determined by the visitor themselves. Such examples show a continued desire to engage audiences in interpreting and contextualising their own meaning-making experiences, albeit examples that were not necessarily successful long-term. As detailed in 2.3.5, Passebois and Aurier (2004) show that unsustainable practices and non-meaningful engagement can limit uptake and long-term engagement, however this is able to be tackled through consciously embedding the experiences in the physical, personal, social, and cultural setting of the individual intervention (Ciolfi and Bannon, 2007).

Social media has, in recent years, proved to be an important tool for museums not just as a way to encourage visitors to share their photographs, but also as a way to reach out to audiences before and after visits, develop branding, and access different kinds of audiences (Zollo et al., 2021; Murphy, 2019; Kidd, 2011). In 2018, 89% of museums surveyed by the UK Museum Association had a social media presence, and several without social media accounts described intending to establish one in the near future (Museums Association, 2018). Social media presence is particularly important in response to the COVID-19 pandemic, during which time social media became vital as the only means of engagement between museums and stakeholders, and subsequently as a way to continue to generate income (Zollo et al., 2021; Ruggiero et al., 2021). Increasingly, it is also being recognised by museums as a tool for increasing interactivity, which in turn is shown to increase loyalty and long-term engagement (Easson and Leask, 2020; Ruggiero et al., 2021; Kidd, 2011), and support long-term learning (Easson and Leask, 2020; Murphy, 2019; Passebois and Aurier, 2004). Social media is a low-cost way for museums to enable the co-creation of such value.

Despite the largely positive attitude to these interventions by museums and visitors alike, much of what is commonly on offer right now have severe limitations that affect the usability and impact of the technology. For example, many of these implementations are highly individual despite the fact that most visitors are proven to attend museums as part of a social experience (Goulding, 2000; Falk, 2009; Eklund, 2020; Fosh et al., 2016). They also have a tendency to utilise visitor mobile phones, which may distract visitors from the physical experiences the museum has to offer and isolates individuals from their peers (Eklund, 2020; Petrelli et al., 2016). It also requires access to a smartphone, which ~19% of museum visitors do not have (Ada Lovelace Institute, 2021; Sinker et al., 2013). Despite this, solo experiences are still an effective way to enhance learning outcomes and meaning-making within cultural sites. For example, Falconer (2017) used **AR** to recreate the historical site of Avebury Henge in south-west England to enable visitors to interpret ways that the cultural site may have originally been built and used. The study found that by showcasing different versions of the henge, overlaid onto the physical environment and integrated with a carefully produced soundscape, visitors became more meaningfully and emotionally engaged with the environment. Vlahakis et al., (2001) similarly discuss using an early adaptation of **AR** to offer personalised guided tours around cultural heritage sites such as that of Olympia to '[bridge] the gap between recreation and science and [render] culture and history more accessible to the wider public' (Vlahakis et al., 2001: 131). Fosh et al., (2013) used an interactive guided audio tour of the Rufford Abbey statue park to encourage visitors to interact with the statues in unusual or unexpected ways for the same purpose: to increase engagement and thereby interpretation. Kidd (2019) went further in holistic engagement and used projection technologies to present an interactive, historical story around Cathays Park to foster empathy and emotional connection with history. These examples of augmented tours were well received by participants and contributed to their overall enjoyment in a wealth of ways. However, despite the positive outcomes, the individual nature of the tours continues to present barriers to average museum visitors.

This exploration of literature has demonstrated that technologies are not only already widely integrated into museum visit experiences, but also increasingly integral to the ways visitors, museums, and content interact with and understand each other. However, when we apply the lens of *museums as place* and consider the four elements that shape it (Ciolfi

and Bannon, 2007; Tuan, 1979), there is still room for improvement in adapting to the needs of the visitor and the affordances of the museum. For instance, many of the interventions here explicitly focus on the cultural, social, or physical elements of place, but very few investigate how the personal experience of the *museums as place* can be augmented with *technology as mediator*. Further, few of the interventions considered multiple elements into their design. Augmenting personal space can be difficult to achieve as it requires insight into the individual themselves. As such, I advocate to recognise the individual as the expert on themselves, and empower the visitor to augment their own personal space. When combined with considerations of physical, social, and cultural elements of the museum, this empowerment opens opportunities for more meaningful engagement, and also opens access to non-traditional visitor groups with differing needs from typical visitors. As Simon (2010: 42) says – ‘If you want to create opportunities for customized content or high-value social interactions, you need to provide visitors with a way to self-identify relative to your institution’.

One further consideration raised in this section is that almost all of the examples required a significant investment from the museum or research team because of infrastructural requirements the experiences demanded, making it impractical and unsustainable for many museums with limited resources. It has been shown that using existing infrastructure can return the physical and economic cost of implementation to more attainable and sustainable levels (Steel, 2012; Caldwell, 2002; Falk and Needham, 2011; Oakley, 2009; Allen and Petterson, 2016), highlighting the potential value of using an increasingly ubiquitous technology such as smartphones (Sinker et al., 2013). Following similar principles, another existing resource comes from personal data. Data-driven technologies are capable of tailoring visits to specific visitor needs and interests with minimal infrastructural inconvenience to other visitors and museums.

2.4.3 The Risks and Opportunities of Personal Data in Museums

Personal data is a contentious phrase that encompasses a broad range of definitions. Previously, personal data was often understood to refer to any data that could be used to identify a person (Tene and Polonetsky, 2011). Following the introduction of the General Data Protection Regulation to the EU and UK in 2016, the European Commission provided a definition of ‘...any information that relates to an identified or identifiable living individual.

Different pieces of information, which collected together can lead to the identification of a particular person, also constitute personal data' (European Commission, 2020). This definition offered a way of understanding personal data that was far broader, widening the scope of what counts as personal data to include almost any data generated by or about an individual. Vitaly, this expansive definition means that what constitutes personal data also becomes highly contextual. What may be considered personal data in one setting, may not be considered such in another. As such, there is no clear delineation for when 'data' becomes 'personal data'. It cannot always be defined as personal in its collection, as intent behind collection does not necessarily reflect the ways it is used. In particular, it does not reflect how the data could be used if it is sold, stolen, or willingly given to third party processors, whose interest in and ability to pair the data with separate datasets may make an otherwise generic piece of data, personal. For the purpose of this project, regarding data collected by museums, I consider personal data to be any data collected by the museum generated about or by an individual who engages with the museum in the capacity of audience or visitor that might be capable, alone or in conjunction with other data, to identify the individual who gave it.

The accrescent 'progress' of technologies to mine, capture, store, process, and share personal data on individual subjects continues to become more pervasive, mundane, and taken-for-granted (Hoffmann, 2020; Nissen et al., 2019) as personal data becomes a commodity and an asset with great value to a wide number of stakeholders (Crabtree et al., 2016; Taylor, 2017; Lupi, 2017; Skatova et al., 2014; Birch et al., 2021). This has led to many institutions, governments, businesses, and websites adopting considerably more vigorous and wide sweeping data capture methods. On one hand this can have a positive impact on many parts of daily life, such as increased relevance of products and services and improved accessibility and convenience (Tene and Polonetsky, 2011). However, a rise in data collection at such a rapid rate necessarily comes with a decline in conscientious, mindful data collection and an exponential increase in risk of exploitation as frameworks and legislation struggles to keep up (Tene and Polonetsky, 2011; Taylor, 2017; Hoffmann, 2020).

There is much evidence of the exploitation of personal data by many companies carried out through opaque, confusing, or even malicious practices (Hoffmann, 2020; Taylor, 2017; Lupi, 2017). Because of these negative practices, public trust over protection and ethical use of

personal data has plummeted (Tolmie and Crabtree, 2017; Taylor, 2017; Hoffmann, 2020; Crabtree et al., 2016; Dowthwaite et al., 2021). Trust is further reduced as much of the general public are aware of, and increasingly concerned about, their data being used, misused, and sold on but lack the knowledge and skills to counter these practices (Tolmie and Crabtree, 2017). This is important because there is a direct correlation between the perceived trustworthiness and familiarity of the data collector and the 'cost' of that data collected (Skatova et al., 2014). Decreased trust in companies to correctly handle and protect data results in less willingness to offer it freely, as well as reduced engagement and thus financial contribution. Conversely, the more trust an individual has in the data collector the lower the perceived cost of that data is, as is the perceived risk in sharing it (Dwyer et al., 2007). Additionally, the more beneficial an individual perceives an exchange in data to be the more likely they are to willingly exchange that data. These anticipated benefits can be either for personal or societal benefit (Skatova et al., 2014). In fact, in a study by Skatova et al., (2014) they concluded that up to 60% of data subjects are willing to 'donate' their personal data if it is expected to be used for altruistic purposes. A higher level of concern for others meant a higher likelihood that individuals would donate their data, as opposed to a higher level of concern for personal benefit which reduced the probability.

As the amount of data collected in daily life continues to grow, the importance of the conversation around personal data rights also heightens. How data practices, both exploitative and ethical, become aggregated into daily life is of vital importance to understand in order to facilitate a shift from data violence (Hoffmann, 2020) and towards something more sustainable. Some academics have turned to the concept of *moral order* as a way to explore this phenomenon. Moral order - the unwritten rules that dictate how people interact with and experience daily life - explain how certain practices come to be expected or accepted within a society. More specifically, the moral order defines what is the 'correct' course of action and what it is reasonable to expect in any given situation (Wuthnow, 1987), providing a framework through which people can contextualise their behaviours and experiences. In terms of data sharing, these unwritten rules confer an understanding of where, when, and who it is acceptable to share different data with (Tolmie and Crabtree, 2017; Tene and Polonetsky, 2011).

The active sharing of personal data is shaped and adapted in mutually accountable ways to the specific circumstances in which it is shared, and it is through what is said and not said, what is shown and not shown, what time and place is chosen or not chosen and what potential prompt is taken up or set aside, in which people exercise control over what data is shared and what use may be made of it. (Tolmie and Crabtree, 2017: 299)

This may mean, for example, taking into design considerations for a data collection process that it is widely accepted that individuals only have the rights to knowingly share one's own personal data (Tolmie and Crabtree, 2017). Making designs fit with the moral order of a society is important for acceptance and uptake, however, the potential role for such designs in social change should not be neglected. For example, it is common for current practice surrounding data collection to have a disproportionate, negative impact on marginalised communities (Taylor, 2017; Hoffmann, 2020). Automated decision-making systems are one such example, as they base their outputs on the input of curated datasets. This has led to much discrimination against, for example, people of colour, and particularly Black communities. The rebirth of redlining – the process of withholding goods or services to people who live in postcodes deemed 'hazardous' – is one such outcome of biased datasets being misprocessed by automated systems (Hoffmann, 2020; D'Ignazio and Klein, 2020; Benjamin, 2019). Race is also a defining factor in the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) algorithm, the most widely used assessment algorithm in the United States that informs prison sentences (D'Ignazio and Klein, 2020). A study conducted by Julia Angwin and reported in D'Ignazio and Klein (2020) showed that COMPAS labelled White defendants as lower risk to reoffend than Black defendants by using questions that acted as proxies to determine race such as family structure, school attendance, and if family and friends have been arrested. However, examples like this are plentiful and not limited by any one identity factor. Job screening algorithms trained on existing datasets overwhelmingly prioritise male applicants, poorer people more likely to have to use public services (and therefore have their data collected more frequently than rich people) are more likely to be targeted by social services, and systems that do not accommodate for different gender identities hinder social progress through the neglect of entire segments of the population (D'Ignazio and Klein, 2020).

It becomes clear that data violence and algorithmic violence are a complex mixture of physical and discursive, and tackling such ingrained bias must begin at a social and ethical level that affects the accepted moral order. However, this too must be done mindfully to prevent falling into the trap of harvesting *more* data to solve the issues that arise from misuse of original data (Hoffmann, 2020) or shifting the onus onto the individual to solve data violence and away from the organisations themselves (Hoffmann, 2020; Taylor, 2017). As such, individuals should be given the opportunity to have a say in what data is collected from them, but they first need educating on the importance and (unseen) ramifications of such decisions in order to affect the social discourse around the topic.

In order to educate people on their rights as data subjects, they must be given opportunities to interact with their own data in ways that are accessible, interesting, and encourage engagement. Data Dashboard is an example of a data management system that encouraged users to curate their own data (Vitale et al., 2020). Data Dashboard allowed users to make their own decisions about what data should be kept or discarded through a centralised overview page with customisable filters. They found that enabling a customisable, centralised area for data to be interacted with re-empowered users to better understand and uphold their own data boundaries. However, elements of automation were poorly received, and factors such as knowledge, social influence, and personality also impacted how successful the dashboard was for individual users. Wook Kim et al., (2019) provide further insight into designing for data collection in their paper about their DataSelfie project. DataSelfie was a tool they designed to allow users to customise their own diverse representations of data. In analysing the usability and sensemaking afforded by the tool, they offer several recommendations that are intended to make data collection and visualisation methods empowering to the user *and* more meaningful for the collector including capturing qualitative aspects of self, supporting data exploration, and supporting conversation through data.

Adopting such considerations into designing for personal data collection is a useful way to ensure that data collection is sustainable both for the organisation, and for the data subject. However, it must also be considered in the design of any system that there should be space for challenging the moral order. Assuming the inherent correctness of widely accepted practice is a danger that not only perpetuates exploitation, but does so at an increased cost

to marginalised or vulnerable groups (Hoffmann, 2020; Taylor, 2017; Crabtree et al., 2016; Foucault, 1980; Foucault, 2000). This is particularly relevant in cultural organisations like museums where, as described in 2.3.1, it is a central tenet to educate audiences and reach out to, not perpetuate discrimination against, hard-to-reach and marginalised audiences. In fact, contemporary discussions around personal data collection and usage draw many parallels with the literature surrounding cultural institutions. Both have been lauded as brimming with opportunities for individual, societal, and collective improvement, whilst also running this risk of exploitation and torpidity that particularly works against marginalised groups (Duncan, 2002; Dodd and Sandell, 2001; Tolmie and Crabtree, 2017; Tene and Polonetsky, 2011; Shone, 2017).

Another important factor established in this literature review is the impact of *trust* on audiences to share their personal data. As data collection is also an increasingly important reality for many organisations, particularly the arts and culture sector, trust must be re-established, and practices must be made transparent for data subjects visiting these organisations to willingly and knowingly share valuable information as a prerequisite for long-term loyalty and engagement (Passebois and Aurier, 2004). People need to be able to exercise control over their own data in meaningful ways (Nissen et al., 2019). Doing so increases the likelihood of an individual willingly sharing their data with an organisation. So too does having trust in an organisation, including feeling able to trust the organisation is honest and careful when dealing with the individual's data. Without this trust, engagement will be short-term at best, and non-existent at worst. This is demonstrable by examining the public response to the COVID-19 Track and Trace app released by the **UK** government in late 2020. The COVID-19 Track and Trace app was a mobile application in which members of the public were encouraged to update their COVID-19 status and would receive notifications if they had come into contact with someone who had recently tested positive for COVID-19. However, the **UK** had one of the lowest uptake rates in Europe for such an app. 50% of people who heard of the app had downloaded it, however 33% of respondents either did not intend to download the app or had already deleted it by December 2020, less than four months after its launch (Dowthwaite et al., 2021). Uptake was particularly small in ethnic minority respondents who were both less likely to download the app and more likely to delete it, as were people over the age of 65. As highlighted in 2.3.5, while the majority of

people said that they would use the app to protect family, friends, and the broader community (altruistic motivations) this did not overcome the risks that the public perceived around 'post-pandemic surveillance, increasing anxiety, and fear of hacking' (trust, privacy, data security, and data surveillance) (Dowthwaite et al., 2021: 2). This example demonstrates that the public seek control and autonomy over their own personal data, particularly when they are unable to clearly understand the impact of their data, both positive and negative (Taylor, 2017). In this example, to claim back some measure of control the public opted not to engage, or to disengage early, from the technology.

2.4.4 The Power of Personal Data

As detailed in 2.4.4, personal data is an increasingly important resource for museums with the potential to help them maintain relevancy and to reach new audiences. However, much like technology, the power of personal data is highly contentious and rife with risks of exploitation. The origin of data power comes from the fact that it represents us (Birch et al., 2021; Nissen et al., 2019). Personal data captures elements of an individual and pulls them together to create a digital representation of that person. Personal data is vital for:

...the forging and preservation of social links, engendering kudos, managing identity, impression management, self-display, creating 'social capital', maintaining trust, to preserve memories and encourage recollection, or even in order to facilitate various kinds of transactions, both commercial and non-commercial and to support the provision of certain kinds of services such as health care. (Tolmie and Crabtree, 2017:

295)

Despite this, the data subject is rarely given power over what data is collected and how it is interpreted. Rather, the power to control such data is exclusively granted to the individual or institution capable of utilising it (Weber, 1978). Therefore, who personal data is shared with and for what purposes becomes a contested ground of shifting power structures.

Further, the nature of personal data itself is highly contextual and predicated on factors including methods of collection, modes of storage, and intention of use. For instance, the data collector may not be the same as the data holder, who may be different from the data analyst. Each party may have a different consideration of what data they require in order

to conduct their roles, how that data might be processed, and what that data ultimately means to them. Even more alienated from the context, the data subject may not be aware of who any of these entities are, nor that they might be separate. In other words, the potentially disparate understandings of what constitutes personal data in different contexts for different stakeholders is an important consideration in understanding the power that such data might have.

As such, the most accessible contextualisation of who and why an organisation accesses personal data is extremely important to the public, despite their lack of control over it (Tolmie and Crabtree, 2017; Nissen et al., 2019). This is exemplified in a paper by (Nissen et al., (2019) in which they deployed a technology probe called *Trustball* at the Edinburgh festival in 2018. *Trustball* explored the delegation of consent by asking members of the public to engage in an arcade-style game to guide a ball, metaphorically containing the participants' data, through a series of flippers depending on their answers to various prompts. Each participant was given three randomised scenarios followed by the question 'who would you trust to make a decision on your behalf?' 50.4% of responses delegated decisions to other people, and 70% of participants opted not to trust someone else for at least one scenario. The context of what data was being shared dramatically impacted who the participant was willing to delegate consent to. For instance, entertainment history for a music algorithm, browser history for holiday planning, and social media for personalised food products were most often delegated to friends. Location data looking at noise pollution, contact list for a work-related app, and anonymised medical records for 'service improvement' were predominantly delegated to an expert. Potential delegates of artificial intelligence and crowdsourcing were the least popular options across all scenarios.

Contextualisation of data collection is not limited to the scenarios for which the data might be used, but also include the context of *how* it is collected (Tolmie and Crabtree, 2017).

Tolmie and Crabtree (2017) highlight distinctions between data people create themselves and data that is created about them; data people volunteer to share themselves, and data that is surrendered on their behalf by agents (machine or human); and data that is actively recorded and monitored continuously by an infrastructure. These distinctions represent the dichotomies of the moral order defined in 2.4.3, and the options utilised affect attitudes to the data collection and trust in the collector. For example, charities and **NPOs** are often

favoured with higher levels of trust than their for-profit counterparts. This is especially true when organisational moral codes are perceived to align with the values of the individual donator (Bekkers and Wiepking, 2011; Passebois and Aurier, 2004; Nissen et al., 2019), when they believe their contributions will make a tangible difference (Bekkers and Wiepking, 2011; Benson and Cremin, 2019; Skatova et al., 2014), and when people feel seen and understood by the organisation (Easson and Leask, 2020; Ruggiero et al., 2021; Zollo et al., 2021; Lynch, 2013). On the contrary, social media is not only capable of, but frequently does, breach moral order by sharing information within networks that the individual did not consent to, resulting in a low level of trust (Isaak and Hanna, 2018; Brown, 2020; Taddei and Contena, 2013). This sharing becomes particularly problematic when the data subject is not given opportunity to screen and edit their data before it is shared, as it may contain wrong, inappropriate, or private information (Tolmie and Crabtree, 2017; Vitale et al., 2020). However, empowering the data subject to monitor and control their own data must not be done in such a way as to remove accountability from the collector. Rather, any attempts at change must strike the difficult balance between protecting data subject rights whilst empowering them to have the means and ability to control their own data (Crabtree et al., 2016; Chamberlain et al., 2017). An important starting point for this is making privacy policies more accessible and meaningful by offering the opportunity for all stakeholders to negotiate terms (Gilman, 2021; Taylor, 2017) and make informed decisions based on the content (Taylor, 2017; Nissen et al., 2019).

Finally, the context surrounding the *sharing* of personal data is also a locus of power relations. Who people choose to share their data with is deeply contextual and deeply personal, although often overlooked in the mass harvesting practices of many organisations. For example, people may be more willing to share personal medical information like weight with a doctor than with an insurance company, or fitness statistics with a partner over a stranger (Tolmie and Crabtree, 2017). Once again, trust is revealed to be necessary for wilful and meaningful data sharing. Where the trust is lesser, for example due to opaque practices and perceived illicit behaviour, people with the capacity and knowhow to withhold their data may choose to do so indiscriminately. This can be damaging to potentially positive uses of personal data such as 'smart grids', electronic toll pricing, inventory-management systems, and Google Flu Trends which track flu outbreaks and enables responsive medical

care (Tene and Polonetsky, 2011). However, for much of the general population, discourses surrounding the sharing of personal data have normalised, or even obfuscated, data violence and made people accept practices that may be detrimental to them or others. One example is in the 'datafication' process that reduces individuals down to statistical inputs and assigns value to them through this quantification process by 'represent(ing) a discourse that is at once social and technological, structuring how various identities and bodies are produced, surfaced, made sense of, seen as legitimate, and ascribed significance' (Hoffmann, 2020: 7). Another example is in the rising spread of dataveillance practices that force individuals to resign themselves to visibility and reduces their ability to engage with it politically (Taylor, 2017). As such, considerations regarding reshaping personal data narratives must be deeply cognisant of the contexts within which the data subject and collector are situated.

2.4.5 Using Digital Gifting to Reframe Data Exchange Methods

As described, the act of collecting personal data from data subjects is deeply embedded as a necessary, legally required, and beneficial act for arts organisations financially, culturally, and politically (Birch et al., 2021; Crabtree et al., 2016; Taylor, 2017; Lupi, 2017; Skatova et al., 2014; Selwood, 2002; Shone, 2017), albeit one which offers minimal value to the individual (Birch et al., 2021). As such, the general public struggle to recognise the intangible value of their individual data and discourses surrounding value are largely limited to exploring its minute financial worth (Tene and Polonetsky, 2011; Crabtree et al., 2016; Birch et al., 2021). Whilst personal data has miniscule financial worth to the individual, it does have a much larger and more impactful *social* value that may be compensated. Highlighting social value to the data subject requires working to negotiate relationships between different stakeholders in novel ways that work within the specific setting of the museum. Such navigation must be mindful of the expectations and limitations of both parties, for example, the financial and infrastructural limitations facing museums and the educational and entertainment needs of the visitor. An area of opportunity within these parameters arises from the frame of 'gifting'.

According to Davies et al., (2010) there are two kinds of gifting – relational, and transactional. Relational gifting is more traditional gifting with substantive levels of reciprocity, for example gifts exchanged between family and friends, and business gifts.

Transactional gifting is more likely to produce endogenous benefits and may present more in charitable environments, academia, and service industry tipping (Davies et al., 2010). Within this paradigm, a gift is defined as ‘...[involving] the selection and transfer of something to someone without the expectation of direct compensation, but with the expectation of a return, be it reciprocity, a change in the relationship with the recipient, or a favor or another social or psychological benefit’ (Davies et al., 2010: 414). Currently, data collection processes act as transactional gifts, in which individuals are expected to donate ill-defined levels and details of personal data simply because it is of benefit to the organisation and with no expectation of reciprocation. This research calls for an overt shift to *relational personal data* gifting wherein the value of the data ‘gift’ is recognised and the expectations are laid at the feet of the organisation to reciprocate. Achieving this requires collaboration between stakeholders to define what the expectations of reciprocation are and to ensure that all parties have their needs considered in the design process. Co-creation, as described in 2.3.4, is an effective means to achieve this that works within the severe limitations faced by arts organisations such as financial limitations and infrastructural factors restricting data collection (Collins et al., 2015) as it allows organisations to draw on external resources and expertise. Co-creation is also effective at involving other stakeholders such as visitors, who take more away from their museum experience when they feel they have contributed to it in a useful way (Simon, 2010) and who are most capable of defining their own needs.

Gifting within the setting of museums is a fledgling area of study, but one that contains numerous exciting implications for the future evolution of museums. Here, I specifically turn to results from projects conducted under the umbrella of the **GIFT Project**, for which I was a part of the research team, to explore how gifting can encourage co-creation of meaningful, data-driven interactions in the museum (Spence et al., 2019; Ryding et al., 2021; Spence et al., 2021; Darzentas et al., 2022; Spence et al., 2020; Benford et al., 2022). Museums offer a valuable and unique environment for gifting to be experienced and shared as simultaneously both relational and transactional, in which the tangible and intangible can be transferred between individuals to enhance the museum experience for both. Three examples are presented below from my involvement in the **GIFT Project** that shaped this thesis through their re-envisioning of data in museums. The first example comes from the Gift App (Spence et al., 2019; Ryding et al., 2021; Spence et al., 2021; Darzentas et al., 2022).

The Gift App is a mobile experience that encourages museum visitors to personalise a gift for a friend or family member based on up to three objects from within a museum. For each object, the gifter could share a photograph, a recorded personalised message, and a 'hint' for the receiver to find the object within the museum. The Gift App found that navigating the museum with a receiver in mind and engaging with objects specifically in order to gift them increased connection between object and visitor, and even between visitor and museum. Importantly, Spence et al., (2019) show that enabling this kind of reclamation for visitors to understand, interpret, and gift parts of their visits did not interfere with standard museum priorities. In fact, the 'embodied' and 'emotional' experience of visitors (Spence et al., 2019: 5) is directly in line with New Museological aims to platform and empower local communities and diversify the 'voice' of curated content (Darzentas et al., 2022; Kidd, 2011; Kidd, 2018). The enablement of co-creation not only affected the dynamics of peer-to-peer engagement, but the data collected via the app - including semantic information and heat maps of popular exhibits – provided value to the museum capable of enhancing visitor-venue relationships over time (Darzentas et al., 2022).

Another powerful example from the **GIFT Project** was VRtefacts – a deployment that combined passive haptics and sensory misalignment to encourage museum visitors to gift personal stories to the museum and future visitors (Spence et al., 2020; Spence et al., 2021; Darzentas et al., 2022). VRtefacts required visitors to don a **VR** headset and enter a virtual gallery space. Within the space, they could choose from one of six artefacts 3D scanned from the contents of the museum itself. Upon choosing an artefact, the visitor was able to interact with a physical prop, which was overlaid with a virtual skin of the fully rendered scan, and asked to dictate a personal story inspired by the artefact into a camera. For many users of VRtefacts, the handling of 'real' artefacts and the situating of (mostly) real stories from the visitors' personal lives within the virtual museum enhanced their relationship with both the museum and the content to a noticeable degree (Spence et al., 2021). The museum also benefited in this exchange as they were able to review and share the stories, both to enhance their own content in line with New Museology principles, but also to curate a community-based history of several of the artefacts.

The final example from the **GIFT Project** is Sensitive Pictures (Benford et al., 2022; Darzentas et al., 2022). Sensitive Pictures was a visitor experience that evoked, measured, and

reflected on emotional response to the paintings of artist Edvard Munch. Visitors to the Munch museum in Oslo, Norway were invited to use a web app that shared provocative, custom created audio stories connected to six of Munch's paintings. Upon visiting the specific piece and listening to the connected audio, visitors were asked to answer a question posed by the audio with a single word freeform response, and complete three Likert-style slider questions about their emotional reaction. Upon completing their visit, visitors were then invited to an isolated booth in which they could have a phone conversation with a virtual Munch who would feed back to them an analysis of their emotional state and print them a souvenir postcard with their personalised data visualisations. Sensitive Pictures is perhaps the most traditional foray into personal data explicated in this section as it collected qualitative *and* quantitative emotion data with clear value to visitors and museum alike. Visitors described a generally positive reflection on the experience, and an overwhelmingly emotional one, in which the technologies prompted them to engage more deeply with the paintings than they would have alone (Benford et al., 2022). The visualisations also gave visitors means to reflect on their experience beyond the physical museum and acted as a point of discussion among peers (Darzentas et al., 2022). The museum in turn received valuable insights into not only the emotional responses to various pieces, but also data on the popularity of different exhibits and routes around the gallery space.

These examples of interventions provide important context for the framing of *relational personal data*. They demonstrate that technology can be used in tandem with physical museum sites – not to replace any part of them but to enhance them in ways that visitors find surprising, engaging, and valuable. They show that empowering visitors to assign their own meanings to content, context, and site creates deeper and more meaningful relationships across all different elements. Most importantly to this thesis, these examples demonstrate practical, successful applications of collaborative co-creation of data-driven and data-generative visitor experiences. Museums offer a valuable and unique environment for gifting to be experienced and shared as simultaneously both relational and transactional, in which the tangible and intangible can be transferred between visitor and visitor, and visitor and venue, to enhance the museum experience for both. In this exchange, the museum gains insight and information on their visitors, and the visitors gain agency and

empowerment to engage in content in ways more meaningful to them. Focusing on the potential of relational exchange demonstrated here, by framing personal data as a gift from the visitor to the museum, it creates potential to push the unique qualities of the museum as a test site for such experiments even further. It creates potential to show the benefits, and indeed the increasing moral obligation, to respond to the data *gifts* shared by visitors; if not in kind then in likeness.

Technology and personal data in museums are shown to be both well established and evolving. As museums continue to evolve the needs of their visitors, the topics they discuss, and the resources they have access to, the potential to push for meaningful change is always on the periphery. However, in order to strive for meaningful change it is vital to understand the underlying power structures that exist so as to not fall into perpetuating damaging discourses and to ensure that change implemented can be maintained long-term.

2.5 Summary

This chapter has introduced literature regarding the three broad themes that constitute the conceptual framework that underpins the remainder of this thesis. This framework presents *museums as place*, *technology as mediator*, and *relational personal data* as the three key elements through which meaningful change can be brought about to enable ethical data exchange within the museum context. Moreover, it also introduced power as a key lens through which the framework is shaped and through which I encourage readers to utilise themselves in their critical engagement with this thesis. Power was introduced as a complex and contested term that is experienced and understood differently from individual, social, and societal perspectives. The resultant understanding of power shows it to not only be central to understanding how barriers develop, but also to be fluid, adaptable, and able to be redirected to overcome the very barriers it is found within. The literature also highlights museums as contested sites where power is played out in micro- and macro-practices that affect and are affected by the societal discourses around them. This was also true of technologies deployed in museums, although a gap was uncovered in which technologies designed explicitly to accommodate the power found in museums are scarce. As such, many of the technologies described here have been effectively deployed as tools to overcome explicit barriers to engagement, but suffer from focusing on addressing specific elements of *museums as place* instead of on the structural barriers that prevent engagement. I posit that

explicit consideration of power in **HCI** research of museums may contribute to the creation of interventions focused on realising long-term museum goals of outreach and education, which are also capable of overcoming these deeply ingrained barriers and keeping up with rapid and wide-sweeping societal changes. More specifically still, literature surrounding the use of personal data as a resource in museums was extremely limited, despite it being shown to be a vital and readily available resource. An exploration of literature emerging from the **GIFT Project** goes some way to highlighting the opportunities that personal data can offer in enhancing the museum experience, albeit one that focuses on using personal data to primarily benefit the visitor. As such, the empirical research that follows addresses these gaps by embedding power and available resources into considerations of **HCI** design, and draws on principles of co-creation to ensure the needs of all stakeholders are met.

3.0 Epistemology, Methodology, and Methods

This thesis employs a novel conceptual framework combining *museums as place*, *technology as mediator*, and *relational personal data* through a lens of power, to explore how meaningful relationships between museums and audiences can be fostered. The framework allows for iterative reflections on the context of the research, the tools and technology used currently and potentially, and the ways that personal data are used and understood. The framework is iteratively applied throughout the empirical research chapters, with each chapter ending with an overview of the how the generated knowledge has contributed to the holistic overview the framework provides. Ultimately, the framework allows us to deeply embed the research within its context and to iteratively re-visit each element from different stakeholder perspectives, presenting an adaptive reflection of generated knowledge that is cognisant of the broader context within which the research sits. The literature review in 2.0 provided a multi-disciplinary overview of each of the frameworks three themes to showcase what opportunities and barriers are available within the museum space that must be utilised or overcome to answer the research questions, as well as grounding the questions within the relevant contexts. This section now turns attention to *how* these questions will be addressed, presenting an overview of the epistemologies and methodologies applied, and explaining what methods were chosen, why, and how they have been implemented.

First, I justify the methodologies and methods chosen through a description of the strengths of qualitative research in the context of this research. I then provide details of the epistemological approach to the research, post-structural feminism, both as explanation and tool for evaluation. Here, I also briefly elaborate on how the epistemological lens and conceptual framework interact with each other and frame the original research undertaken. The next section provides a comprehensive overview of the different methods of data collection and analysis used throughout the research including a novel methodology I developed with colleague Dr Velvet Spors called data-informed design fiction.

3.1 Theoretical Frameworks to Guide Qualitative Research

Qualitative research allows us to explore the world by examining the meaning ascribed to an issue or phenomena by individuals or groups (Mason, 2002). Research questions are

generally formulated as part of the research process, and analysis is often inductive and conducted in stages that seek to understand individual, complex meaning-making (Creswell, 2014). Qualitative research allows us to celebrate the complexities of the subject being studied without trying to reduce its complexity:

Through qualitative research we can explore a wide array of dimensions of the social world, including the texture and weave of everyday life, the understandings, experiences and imaginings of our research participants, the ways that social processes, institutions, discourses or relationships work, and the significance of the meanings they generate ... This means that it has an unrivalled capacity to constitute compelling arguments about how things work in particular contexts. (Mason, 2002: 1)

Qualitative research often utilises a theoretical framework to guide it. In order to choose a theoretical framework appropriate for a study, the researcher considers the context of the phenomena being studied, their own lived experiences and assumptions, and which methods, analysis, and forms of interpretation are most likely to address the research questions. Once identified, a theoretical framework can then provide guidelines as to how epistemologies, methodologies, and methods might best be wielded. Theoretical frameworks broadly and contestably fall into what Creswell (2014) terms 'worldviews', otherwise known as ontologies. The four most widely discussed and recognised of those are postpositivist, transformative, constructivist, and pragmatic. Each worldview espouses its own philosophical ideas, methods, and goals that shape research, and clarity of worldview is vital to transparency of research. Due to its multidisciplinary nature, this project straddles the line between constructivist and transformative paradigms. Constructivist worldviews focus on deep understanding, multiple individual meanings, social and historic construction, and theory generation to understand how individuals experience encounters through interaction and historical and cultural norms (Creswell, 2014). Transformative worldviews are political, power and justice oriented, collaborative, and change-oriented, and often focus on working with marginalised groups towards social change (Creswell, 2014). Both of these paradigms are predominantly qualitative and accept meaning as culturally, and historically constituted and negotiated, and assumes that individuals experience all of these things in a way unique to them; including the researcher (Creswell, 2014).

Identifying and implementing a theoretical approach early on in a research project has many benefits. It guides initial questions, analysis, and research (Bradbury-Jones et al., 2014); encourages consistent, congruent research (Dickerson, 2010; Creswell, 2014); situates the researcher in appropriate academic discourses and vernacular; and can even illuminate the strengths and weaknesses of a study (Anfara Jr., 2008). However, there are also risks to embedding a theory from early on, as it can limit what the researcher sees and thus what knowledge they are capable of delivering to the reader (Anfara Jr., 2008). In order to address concerns of these limitations the researcher must actively participate in transparency, consistent reflection, and overt attention given within the finished writing to what may be concealed or limited (Rhedding-Jones, 1997). Vitality, as 'reflective knowledge, even of one's own experience, is nowhere and never a literally 'repeated experience' or a simple 'photograph' of what was experienced' (Weber, 1949, cited in Brennan, 2020: 7), this must also include transparency as to my own lived experiences that may shape how my theoretical framework is applied. As such, I reflect on my own positionality and relevant life history. I am white, queer, and atheist. I was raised by a middle class family in the **UK** and museum visits were a common activity we undertook together during my childhood and teenage years. During the PhD process I was diagnosed with attention deficit hyperactivity disorder, and my younger sibling is also neurodivergent. Our family often split up to explore museums, with myself and my father spending much more time engaging with content than my mother and sibling who tended to gravitate to interactive content and finish their visit quickly. I also have a history of physical (dis)ability, which meant I spent much of my adolescence using a walking stick, crutches, or a wheelchair to navigate.

The philosophies that underpin the different worldviews described lend support to applying different epistemologies, methodologies, and methods to a research project.

Epistemologies, methodologies, and methods are separate but interconnected aspects of theory that impact the research produced (Braun and Clarke, 2013). Epistemology, although a contested concept, is used here to mean the justification or theory of knowledge, or how our experience or reason allows us to know something (Bradbury-Jones et al., 2014), it 'determines *what* counts as valid, trustworthy, 'true' knowledge within a community and, conversely, what is seen as not valid knowledge' (Braun and Clarke, 2013: 29). Methodology contributes to both the theory behind and the analysis used in a piece of research by

describing, explaining, and justifying the methods. A consistent, well-defined methodology lays out and makes explicit assumptions, principles, and procedures (Carter and Little, 2007). Methods are the tools and practices used to gather evidence or data. These three concepts are the foundation stones of rigorous qualitative research, and all feed into and influence one another: Epistemology shapes and modifies methodology; methodology justifies, guides and evaluates methods; methods produce and analyse data; data creates knowledge; and knowledge is justified and evaluated through epistemologies. There are a great many established epistemologies that can add value to different kinds of qualitative research including justification and validation of generated knowledge. Each has its strengths and weaknesses that determine what studies they will afford rigour and consistency, and which they will confuse or detract from. For this research, I draw on post-structural feminism.

3.2 Post-Structural Feminism

Post-structural feminism is an approach to research that pulls together two highly influential fields; post-structuralism and feminism. Post-structuralism arose in the 1980s as a counter-movement to structuralism. It is not the anti-thesis of structuralism, which says that there are 'real' structures underlying meaning (Dickerson, 2010), but instead a critical response to it. It discusses the cultural and historical context of structuralism, as well as providing a theoretical position that attempts to understand knowledge production. Positioned within the broader concept of postmodernism (Given, 2008a), post-structuralism centres around situated, contextual, individual experience, and rejects attempts to capture or explain a consistent reality (Sandu, 2011). It rejects concepts of *objective truth* or *metanarratives*, instead valuing the situated and contextual experiences of individual subjects (Kelemen and Rumens, 2008; Given, 2008b). It attempts to access these experiences through an understanding of discourse.

Discourses are made up of 'signs' that can be words, images, sounds, objects, etc., which hold no intrinsic meaning but are *given* meaning through use. They are used to specify and share knowledge and are a useful tool to understand how different discourses are attributed different meaning by different people in different contexts (Kelemen and Rumens, 2008; Given, 2008c; Baxter, 2008). Discourses can also carry meaning within them by utilising consistent 'signs', which Derrida (1978) says generate the façade of objectivity

through their repeated use. For example, concepts of ‘masculine’ or ‘feminine’ carry much the same meaning across Western cultures and allow communities who share those discourses to communicate more efficiently, codifying their own identities within that setting. Through the same process, however, discourses and signs can also disseminate false, damaging, or problematic knowledge, perpetuating unequal power relations and enabling harmful practices (Derrida, 1979; Foucault, 2016).

Feminism is an approach which also focuses on power and the ways in which dominant discourses control, marginalise, or silence particular groups of people through internalising and naturalising powerlessness (Gaventa and Cornwall, 2015). It often critiques these ‘norms’ by examining taken-for-granted assumptions and notions of ‘difference’ (English, 2010). Feminist lenses are applied to understand gender, sexuality, race, class or (dis)ability, and heavily rely on understanding knowledge as deeply situated. Post-structuralism and feminism are natural allies when trying to understand experience and power thanks to their focus on context, subjectivity, deconstruction, and discourse (Kelemen and Rumens, 2008; Rhedding-Jones, 1997; Cairns, 2013).

The amalgamation of these approaches offers ‘a mode of knowledge production which uses poststructural theories of language, subjectivity, social processes and institutions to understand existing power relations and to identify areas and strategies for change’ (Weedon, cited in Pierce, 2010: 37). It examines how knowledge and power change within given contexts for individuals and how they both combine to create culturally accepted or taken-for-granted forms of knowledge and power. It views people as fragmented, decentred, influenced by social relations, and constituted through knowledge, discourse, and power (Given, 2008b; McWhorter, 1999). In line with the overview of power we gathered from Max Weber, Barry Barnes, and Michel Foucault in 2.1, it views power as an embedded, ubiquitous force, shaped through discourse and capable of being wielded, albeit to different degrees, by everybody. Because it is omnipresent, power is relational, generative, and deeply bound in knowledge and discourse (Kelemen and Rumens, 2008). Post-structural feminism often evaluates discourse through an exploration of power, given that ‘people have power in direct proportion to their ability to participate in the discourses that shape society’ (Foucault, 1980: 354-355). This section is dedicated to exploring post-structural feminism – what methodologies and methods are suitable, how the knowledge

generated in this thesis can be understood and validated through applying the epistemology, and consciously exploring the limitations and contestations that are assigned to post-structural feminism.

3.2.1 Methodology and Methods for Post-Structural Feminism

Post-structural feminism explores discourses to look for recurring themes, contradictions, and patterns (Given, 2008b) in order to understand how performance, identity, behaviour, language, and other signs are used to represent and communicate experience and knowledge (Sandu, 2011; Derrida, 1978), as well as how discourses reflect and shape power (Barnes, 1984; Barnes, 1992; Foucault, 2016; Aitchison, 2000). By exploring discourses and signs, researchers using post-structural feminism explore meaning-making and how knowledge and power combine to create 'accepted' or 'taken-for-granted' knowledge. This also means exploring everyday experiences and how people affect and are affected by their social relationships (English, 2010; Aitchison, 2000), reflexively changing their own construction to meet the needs of any given situation. Critically examining taken-for-granted knowledge highlights micropractices that are performed, which in turn provides insight into the manifestations of power embedded in these practices and how they are accepted or rejected in the 'battle for truth' (Given, 2008b). Once these micropractices are revealed, it also becomes possible to find ways to subvert micropractices to redistribute power through micropractices of resistance, technology, or further discourse (English, 2010).

Qualitative research is ideal for post-structural feminism approaches as only through qualitative practices can the complexity of experiences and meaning-making be acknowledged. Exploring the subjectivities and identities of those under examination in this way can capture the reflexivity and fluidity of signs, discourses and micropractices experienced and perpetuated. To explore these elements of experience, post-structural feminism employs methods that are capable of textual analysis. 'Texts' can consist of typical written, spoken, or visual data or they can include more abstract texts to analyse, such as the presence or absence of something in space (Gannon and Davies, 2012). Post-structural feminist analysis methods often cross disciplinary boundaries to deconstruct these texts, for instance through discourse analysis, content analysis, or thematic analysis. Deconstruction may mean looking within texts and examining different voices, emotional tones, style of speech and levels of intensity. However, equally important in post-structural feminism is the

exploration of paradoxical texts, contradictions, omissions, and gaps in what is being said (Kelemen and Rumens, 2008; English, 2010). To deconstruct discourses, researchers can explore either linguistic form, such as grammar, cohesion and linguistic resources; or linguistic context, which explores cultural and social resources and practices used to give significance to experience. In the context of the museum, the latter allows us to focus analysis on how our three conceptual framework themes meet, interact, and shape each other.

Post-structural feminist methodologies are particularly valuable to explore complex, real-world scenarios because they encourage and facilitate the inclusion of multiple perspectives, each of which can be understood as multifaceted and complex in their own right. These perspectives are not only limited to people directly related to the research questions, but also encompass the space itself (Nelson, 1999; Coia and Taylor, 2017), peripheral stakeholders (as defined in Glossary and Abbreviations) (Aitchison, 2000; Singh, 2005; Pierce, 2010), and the researcher(s) (Cairns, 2013; Baxter, 2008). Post-structural feminism understands that multiple discourses, signs, and micropractices are performed, adapted, perpetuated, and challenged in any given scenario. These experiences are grounded necessarily in the temporospatial context within which they happen, context that in turn is also performed, adapted, perpetuated, and challenged by those experiences (Nelson, 1999). As such, place itself can be seen to act as a locus of discourse – what it enables and disables fundamentally affects the ways it is understood and used. Therefore, examining place and space is shown to be integral to unpicking discourses performed within it. In terms of other stakeholders, through its rejection of objective, universal ‘truths’, post-structural feminism is able to challenge the dominant discourses that shape society, explicitly including marginalised, disempowered, and ‘othered’ groups and acknowledging the alternative discourses that shape their experiences (Baxter, 2008). This can also be used to understand what discourses are missing or under-represented in a scenario. The researcher(s) themselves also offers a vital perspective to consider, both in terms of what they uncover and as an individual with their own experience, identities, and power reflected within the research. Being able to recognise one’s own position within power structures is a vital part of understanding power relations, and encourages transparency and rigour in the research process (Cairns, 2013). In a project by Cairns (2013) that utilised post-structural

feminism to explore identities of school children at a rural school in Canada, she explains that post-structural feminism enabled her to analyse not only the discourses demonstrated by the school-children, but also to explore the discourses that connected the research, the researched, and the researcher. This deeply situated the output of the research and enabled a balanced methodology that explored power and subjectivity. This offers a core element of this project that will be reflected upon throughout the research and within this thesis, and a key reason that post-structural feminism was deemed the most appropriate epistemological lens. In order to understand the role of personal data in museums, we must give due consideration to the visitors, the venues, the personal data, and the positionality of the researcher.

To explore personal data in museums this project focuses on understanding how the discourses surrounding data in museums and broader society are understood internally and externally, and how that is reflected in the ways museums are experienced. As part of this exploration, I also look to discourses and signs experienced and resisted by different stakeholders and the spatial context of these experiences. Experiences are always embedded in place, although as detailed in 2.3, place is a relative concept and not often geographically contained (Lefebvre, 1992; Cresswell, 2014; Massey, 1994). Place is created through negotiation, contestation, and knowledge production, and given that knowledge production is deeply shaped by power and power-infused practices, the concept of place has power embedded within it. Post-structural feminism allows us to acknowledge and explore the situated nature of experience, including within broader social systems like gender, class, race, sexuality and (dis)ability, to understand how those power dynamics are shaped by and shape the outputs. By utilising methods capable of reflecting on the situated experience of a museum visit, what discourses are present and performed, what discourses are not, and how discourses are conceptualised and shared in practice and in theory, it will become possible to establish how personal data can be used to shape internal and external contexts. From here, we can turn to shaping the dominant and taken-for-granted discourses surrounding data collection to redefine data exchange as relational.

3.2.2 Limitations and Contestations of Post-Structural Feminism

Whilst introducing an epistemological approach early encourages rigorous research, post-structural feminism also has a number of limitations and contestations that must be

addressed. Coming from an interpretivist approach, post-structural feminism leans heavily on relativism - the idea that there is no objective reality to measure and we can only understand the world through individual experience and shared discourse (Baxter, 2008; Aitchison, 2000; Sandu, 2011; Stoller, 2009; Given, 2008b). Therefore, there is a risk of any analysis becoming fixated on what is being *measured*, rather than what is being *shown*. This would result in a surface-level and subsequently unproductive analysis (Gannon and Davies, 2012) that provides radical critique, rather than radical transformation through social change. However, Foucault (2000: 456-457) argues that critique and transformation are actually implicated within one another:

*To practice criticism is to make harder those acts which are now too easy...
[A]s soon as people begin to no longer be able to think things the way they
have been thinking them, transformation becomes at the same time very
urgent, very difficult and entirely possible.*

By integrating post-structuralism and its focus on reframing discourse, and feminism and its focus on transformation and practising critical evaluation of discourse, we are able to shift into 'more hopeful and often more radical ... modes of thought and existence' (Gannon and Davies, 2012: 27) than other relativist approaches might facilitate. In addition to this theoretical counter, and as described in 1.2, I also use multidisciplinary as a tool to ensure that the research is capable of being reflexive, iterative, and transformative. New Museology provides a grounded, tangible approach to museum studies that ensure the work is cognisant of its context. Human Geography as applied throughout this research encourages reflexivity and methodological rigour that ensures consistency and adaptability in equal measure. Human Computer Interaction provides design principles that ensure that design is 'an intervention, an intentional effort to create change' (Bardzell and Bardzell, 2011: 676). By drawing on the wealth of knowledge that each discipline can offer, I not only produce research capable of overcoming the theoretical limitations of critical evaluation, but I create something reflexive, deeply grounded, and capable of enabling meaningful change.

Post-structural feminism can also be criticised for its resistance to acknowledge constructs and structures in such a way as can remove agency from the subject. As the critique says, by

over-relying on discourse to such a degree that existing structures and constructs are rendered irrelevant, it reduces the validity of claims made by underrepresented and marginalised groups of people who suffer for living under those structures (Given, 2008b). However, as long as the researcher is mindful of this risk, post-structural feminism does not inherently necessitate the complete removal of structures; rather, it can be aware of those structures *as part* of how discourses are formed and perpetuated. This criticism is primarily addressed within the research through the explicit consideration of *museums as place*, the active inclusion of structures – past and present – as central figures of how discourses are experienced. This inclusion creates space to re-examine and redeploy discourses as part of their fluctuating spatiotemporal context, to see how they interact with and affect each other (Nelson, 1999), and creates room for understanding individuals as complex, multi-layered, embodied individuals (Halberstam and Livingston, 1995; Gannon and Davies, 2012); as Braidotti (2002) says, a ‘subject-in-process’.

3.3 Methods for Data Collection and Analysis

This chapter so far has presented the methodological framework that guides the collection and analysis of data for this thesis. This has included an explanation of worldviews, epistemology and methodology including critique. Post-structural feminism as an epistemology encourages a methodology that focuses on examining discourses, signs, and micropractices through a lens of power. To apply this methodology, the following research draws on a range of methods that can uncover, explore, and analyse these elements of experience by looking at *texts*. These texts are analysed to explore cultural and social resources and practices used to give significance to experience and uncover discourses surrounding *museums as place*, *technology as mediator*, and *relational personal data* in the museum. Each study presented in this thesis is designed *sequentially*, that is, each study builds on the corpus of information collated so far from the related literature and the findings of the studies that preceded it. The sequential nature is, in part, a response to the reflexive and iterative nature of post-structural feminist research. As the corpus and understanding of the phenomena under examination grow, each study is able to absorb that knowledge to guide the research closer to answers that reflect the multitudinous, fluid discourses, signs, and micropractices in play. This is reflected particularly in the co-creative ways that different voices are embedded in the research. In order to ensure that

participants are able to shape how the research progresses and what points of discussion are centred within the arguments made, each of the four studies is run reflexively and iteratively. Study one provides points for discussion based on the real input of existing museum privacy policies. Study two gives participants chance to respond to those points, direct the conversation towards topics they find most poignant, and to define what questions must be taken forward. Study three similarly gives participants chance to respond to the information highlighted by previous participants, and to dictate what is important to them and what should be explored further. The final study continues this trend, giving participants freedom to engage with prior discourse or not, to utilise the findings so far in ways meaningful to them, and to shape their own experiences and reflect on what they might want to change.

As such, a range of methods are utilised that respond to the needs of that specific study. This section presents an overview of the methods used for collection and analysis, including drawing attention to their strengths and weakness.

3.3.1 Collection and Analysis Methods Overview

In order to collect the data required to answer the research questions presented in 1.4, a number of methods of data collection have been employed, each of which are listed here and explained in more detail in their respective study chapters.

1. Study one undertakes a content analysis through a cross-sectional, purposive sampling of museum privacy policies. The data collection uses purposive sampling to identify museums through three different means that reflect how typical visitors might choose museums to visit and examines the data types explicitly labelled within the selected privacy policies.
2. The second study conducts a workshop with members of staff from art museums. It collects data through audio transcripts and written materials generated by participants including post-it notes, drawings, and worksheets. This data is subjected to reflexive thematic analysis.
3. The third study initially collected data through workshops with museum audiences, but was translated to a virtual series of activities conducted individually but in a communal, virtual space in response to COVID-19 lockdown measures. Data collected is therefore a combination of audio, physical worksheets and post-it notes,

and online worksheets and sticky notes. Audio transcripts from the first workshop are removed from the corpus as they were not replicable in the online study.

Collated physical and digital materials are subjected to content analysis.

4. Study four invites museum audiences to attend a virtual gallery walkthrough using a technology probe, MuNa, as a companion app. Participants are interviewed before and after their visit and audio transcripts are subject to reflexive thematic analysis. Study four participants also provide behavioural data that is manually captured from video files of the virtual visits and logged into an Excel spreadsheet that also contributes to the analysis.

3.3.2 Content Analysis

Content analysis is a method that covers a broad spectrum of research types and styles. This project uses it as ‘the systematic study of texts and other cultural products or non-living data forms’ (Leavy, 2007: 229). Such a definition allows much room for interpretation of what ‘systematic study’ means and what can be defined as a ‘text’. However, using the epistemology and methodology laid out in this chapter, we can apply an understanding of ‘texts’ as things that offer ways to understand the world and the other things within it. This can be as micro as the written word, or can encompass far more macro representations of the world such as capitalism or mass media. Texts can be understood to mean bodies in space, space itself, non-linguistic systems, images, sounds, and more (Gannon and Davies, 2012; Leavy, 2007; Leavy and Harris, 2018). If the object can contain within it meaning ascribed by people and cultures, it can be perceived to be a text (Sandu, 2011; Given, 2008b; Kelemen and Rumens, 2008; Foucault, 1980). Studying texts offers an opportunity to understand what knowledge and assumptions are contained within the text, and what knowledge and assumptions are left out.

Content analysis systematically looks through a text or series of texts to find the meanings contained within them (Tight, 2019). Such explorations can be both qualitative and quantitative, with qualitative being the type employed in this research so as to enable analysis capable of exploring meaning and experience. As part of the analysis process, content analysis makes use of a coding frame, developed as either concept driven (frame is developed from previous knowledge) or data driven (frame is developed from iterative analysis of data). As this research is reflexive, sequential, and iterative, each content analysis

uses a data driven frame that draws on the data from the literature, its own data, and where possible, the previous studies.

Typically, content analysis is highly exploratory and inferential, following a process that condenses the amount of data presented through the standardisation and simplification of texts into relevant and digestible units known as codes (Schreier, 2014). This research specifically uses a kind of content analysis known as data modelling, in which these codes are then categorised further into data topics that encompass similar data points collected (Fabian et al., 2017; Amos et al., 2021; Macaulay and Bourne, 2002; Srinath et al., 2021; Slavin et al., 2016; Zimmeck et al., 2019). This can be achieved manually by the researcher(s) or through unsupervised machine learning techniques that are then manually crosschecked through a process known as topic modelling (Srinath et al., 2021).

A content analysis typically follows eight steps (Schreier, 2014):

1. Decide on a research question
2. Select material
3. Build a coding frame
4. Segmentation
5. Trial coding
6. Evaluating and modifying coding frame
7. Main analysis
8. Presenting and interpreting findings

Through the application of these eight steps, content analysis benefits from replicability and validity (Tight, 2019) underpinning its analysis of texts. However, as with any method, there are important critiques to consider as potential limitations of content analysis. In particular, content analysis requires complex concepts to be broken down into codes. Whilst those codes can be reflexive, iterative, and well supported, they necessarily require some nuance to be lost through the coding process. However, the benefit of such categorisation is in the creation of digestible and easy to work with codes that can enable more meaningful discussion of interaction and contextualisation. This means that while nuance of raw data may be lost, nuance in discussion can be more readily generated than in other methods such as reflexive thematic analysis (3.3.3). As such, methods were carefully applied to each

study in consideration of both the specific data being collected, and the aims of that data collection.

3.3.3 Reflexive Thematic Analysis

Reflexive thematic analysis is an oft-used qualitative practice that enables deep, meaningful connections and understandings of a data set to be drawn out. Data is iteratively categorised into themes and subthemes based on patterns within the data (Braun and Clarke, 2006). These themes are actively identified by researchers to represent 'patterns of shared meaning, united by a central concept or idea' (Braun and Clarke, 2020: 13). Where content analysis is valuable at taking complex, mixed data sets and simplifying them into digestible codes for analysis, reflexive thematic analysis aims to define complex concepts from a text (usually from spoken text such as from workshop or interview transcripts) that present stories about the phenomena under investigation.

Reflexive thematic analysis is conducted on a spectrum of inductive to deductive approaches as defined by Braun and Clarke in their landmark 2006 paper, and subsequently built upon in works by the same authors published in 2019 and 2020 (Braun and Clarke, 2006; 2019; 2020). Inductive reflexive thematic analysis identifies themes almost exclusively from the dataset, identifying a diverse set of patterns based on a combination of epistemology and content. Deductive reflexive thematic analysis is driven by existing questions and sometimes uses pre-defined themes drawn from the epistemological positions of the research and the intention of the research. As reflexive thematic analysis is an interpretative activity, identifying the epistemological stance of the research and the positionality of the researcher is imperative in reflexive thematic analysis early in the process so as to better work with the data in a consistent and meaningful way (Braun and Clarke, 2019). This provides rigour and systematic processing whilst encouraging analysis that is fluid and recursive (Braun and Clarke, 2019). This thesis uses inductive reflexive thematic analysis to explore interview transcripts through the epistemological lens of post-structural feminism.

Inductive reflexive thematic analysis is conducted through six key stages (Braun and Clarke, 2020; Braun and Clarke, 2006):

1. Data familiarisation and writing familiarisation notes

2. Systematic data coding
3. Generating initial themes from coded and collated data
4. Developing and reviewing themes
5. Refining, defining and naming themes
6. Writing the report

The first stage asks the researcher to familiarise themselves with the data by reading through the full dataset at least once before beginning analysis. Next, nodes can begin to be coded by once again reading through the data and making note of any patterns or interesting data points in the process. Nodes at this stage should be broad and inclusive, with data potentially appearing in many different nodes at once. At this stage, the researcher may begin to take note of any contradictions or tension in the data, which should be included in the coding. Using post-structural feminism, this also includes looking for missing or excluded information that might be deliberately or passively omitted. Once many nodes have been identified the process of theming the nodes can begin. Themes should attempt to find patterns not just within the data, but within the nodes, and the researcher should begin to think about how the relationships between different nodes and themes might be drawn out further. Themes should then be revisited to make sure that the nodes within them have cohered meaningfully and that the themes are sufficiently distinct from one another. The researcher may choose to combine nodes and themes, move them into different or new places, or discard nodes that become redundant. Themes should continue to be iteratively revised and further defined as part of the continued analysis. These stages are not followed in a fully chronological order, as the process of reflexive thematic analysis is iterative and responsive to the data. Stages 3, 4, and 5 can be repeated as many times as deemed necessary and often the boundaries between the stages blur throughout this process. In line with principles of post-structural feminism, this ensures that the researcher is constantly considering and questioning assumptions made in order to produce strong analytical outputs (Braun and Clarke, 2019). Finally, data should be reported concisely, coherently, logically, and non-repetitively to best demonstrate the analysis undertaken.

3.3.4 Data-Informed Design Fictions

The final method of data analysis employed in this research is one developed through collaboration between myself and friend and colleague Dr Velvet Spors that builds on the

existing method of design fiction. Design fiction is an emerging method in HCI, albeit long established elsewhere, that continues the historic tradition of perpetuating innovation through fiction (Baumer et al., 2020; Wong et al., 2017). Design fiction **Error! Reference source not found.** is most often utilised by a singular researcher or research team, or a group of participants in a workshop type environment, working together to re-envision potential future based around a pre-determined theme through speculation (Edwards et al., 2016; Ballard et al., 2019; Wong et al., 2017; Skirpan and Fiesler, 2018). This tradition of innovation through design has been particularly prevalent in the relationship between science fiction and technological design, with examples like Star Trek inspiring the flip phone and Minority Report inspiring multi-touch interfaces (Linehan et al., 2014). Design fiction has been defined as ‘the deliberate use of diegetic prototypes to suspend disbelief about change’ (Quote by Bruce Sterling in Linehan et al., 2014: 24). By situating a prototype in a fictional world, it becomes possible to explore different potential futures and interrogate them to think about broader cultural, social, political, psychological, ethical, and technological contexts (Baumer et al., 2020; Linehan et al., 2014; Ballard et al., 2019). These conceptualisations then allow critical reflections on assumption and values that are embedded in daily life and how these could be affected in the future (Linehan et al., 2014; Wong et al., 2017). Further, through acts of speculation, space is created for the researcher(s), participants, and subsequently readers to formulate more questions, critiques, and reassessments that further contribute to the imaginaries created (Edwards et al., 2016). Design fiction is not a method that is capable of claiming a certain outcome from the fictions involved, but rather it draws attention to existing problems and phenomena through its lens that can then be built upon in tangible practice (Baumer et al., 2020; Ballard et al., 2019). Design fiction **Error! Reference source not found.** therefore offers a powerful method to approach design that draws attention to the complexity of life and its problems, and offers myriad potential ways to overcome them.

As demonstrated, this method can be a powerful tool for re-imagining the future based on the perception and needs of those using it. Despite it only relatively recently being recognised as a unique approach in HCI, design fiction has previously been used by HCI researchers in multiple ways, for example the common practice of using personas and scenarios are rooted in design fiction (Blythe, 2017; Linehan et al., 2014). Some forms of

prototyping such as rapid prototyping can also be understood as a kind of design fiction. As it is becoming more recognised and utilised as a method, design fiction is able to be applied in more advanced and nuanced ways that include more complex world building and prototyping to imagine potential futures. Blythe (Blythe), explains how this can be achieved as part of a research through design approach, in which fictions capable of speculating on and evaluating possible technology-driven futures can be generated in both narrative and prototype or probe format.

To build on this evolving approach to re-imagine a future grounded in the needs of multiple people and cognisant of the complex discourses, signs, and micropractices that coalesce in place, this thesis advocates for the implementation of a *data-informed design fiction* that utilises existing data in its process of reimagining. By using existing datasets, the researcher(s) can draw on a number of different sources simultaneously, lending to the complexity of resources that need to be considered for an effective design fiction e.g. cultural, social, political, technological, ethical, economic considerations and so on. Not only does drawing data into design fiction enable potentially broader perspectives to be included, but it also makes ‘hidden’ or mundane elements of daily life so often overlooked in **HCI** research (Lindtner et al., 2016; Devendorf et al., 2019; Keyes et al., 2019) more visible. As such, data-informed design fictions offer a novel approach to research through design capable of considering a broad range of voices and priorities in its speculation, lending weight to an imagined future encompassing even the previously disempowered. This can be done in numerous creative ways, but for the purpose of this thesis I offer a fictional account of a future museum visit enhanced with a speculative technological intervention. The technologies imagined in this fiction are then, as part of the same research through design approach, deployed as a technology probe for future users to engage with as a means to evaluate, reflect, and re-imagine the future museum.



Empirical Research

4.0 Contextualising Personal Data in Museums: Study One

4.1 Introduction and Background

This chapter presents the first study conducted to establish the groundwork needed for the thesis. As the thesis follows a sequential, iterative design, this first study aims to provide contextualising information about the current state of personal data in **museums**, offering examples of what data is frequently collected, how accessible relevant information is to the public, and extrapolating details on museum practices and priorities based on the frequency of data types (Figure 2). This is done through an exploration of art museum privacy policies found online.

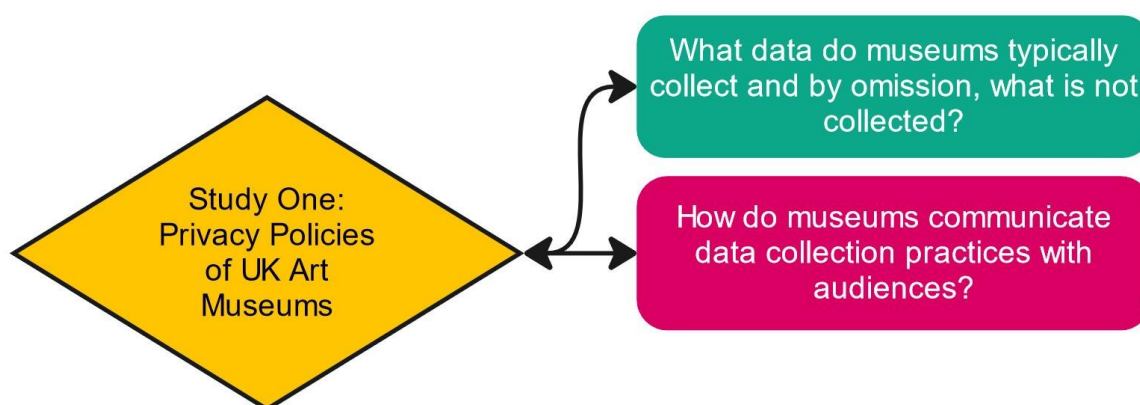


Figure 2. Sub-questions Addressed in Study One

In order to explore museum data collection practices, it is vital to understand the landscapes of power within which they reside. Most **UK** museums are not-for-profit organisations (**NPOs**), and almost all museums in the **UK** rely on external funders to keep their doors open (Mendoza, 2017). Neil Mendoza, in a report on museum funding commissioned by the Department for Digital, Culture, Media, and Sport (**DCMS**) in 2017, identified 16 sources of government funding that support the museum sector in the **UK**. A major source of funding he identified comes from the **Arts Councils** (with respective councils for England, Wales, Scotland, and Northern Ireland, although Northern Ireland was not included in the report). The **Arts Councils** are the main agencies responsible for supporting non-national museums and museum development in the **UK**. One requirement from the **Arts Councils** for funding is the active contribution of data to the **Audience Agency's** Audience Finder survey (Arts

Council England et al., 2022). The survey collects several pages of data from **visitors** in-person, which must then be processed, uploaded, and submitted to the **Arts Councils** by museum staff. The data collected from this survey ranges broadly in scope asking about families, fundraising, website usage, social media usage, sales, and more (The Audience Agency, 2022a). The **Audience Agency** recommends collecting the data consistently throughout the year in order to collect from a large sample of visitors, for which organisations are expected to train their own fieldworkers to complete the surveys and upload the data. Further, Arts Council funding comes with numerous other requirements such as the provision of paid internships, equality action plans, environmental sustainability processes, artistic and quality assessments, annual reports, and more (The Audience Agency, 2022a). When museums meet these requirements they are entitled to receive, in addition to the agreed funding, collated data in the form of ‘audience reports’ that can further be shared with other funders and **stakeholders** (The Audience Agency, 2022b). Similarly, a number of the other funding sources highlighted by (Mendoza, 2017) require the collection, processing, and uploading of datasets about the museum and its visitors. Such intense requirements naturally dominate the allocation of resources, forcing museums to take what they need from their **audiences** with little reciprocation, in order to meet the minimum requirements of their museum funding, for which they also receive little reciprocation.

In the **EU** and **UK**, it is (at time of writing) legally required that organisations explain how personal data is collected and processed in ‘a concise, transparent, intelligible and easily accessible form, using clear and plain language’ at the moment any personal data is collected from an individual (Article 12, Publications Office of the European Union, 2016) although, as established in the definition given in 2.4.4, it is ambiguous what the term ‘personal data’ actually means. This can be provided ‘in writing, or by other means, including, where appropriate, by electronic means’ (Article 12, Publications Office of the European Union, 2016). The most widely used method of sharing information about data collection is through providing a privacy policy.

Privacy policies have long been a contentious practice for organisations in terms of what should be included, and what can be left out. The introduction of the General Data Protection Regulation act (**GDPR**) across the **EU** and **UK** in 2016 brought some level of clarity

and regulation to data collection, but adoption of **GDPR** rules has been variable across different sectors and organisations. **GDPR** is a series of laws written to protect the rights of members of the **EU** to ‘the right to respect for his [sic] private and family life, his [sic] home and his [sic] correspondence’ (Council of Europe, 1950: 11). In the arts and charity sector, the introduction of **GDPR** had a broad impact on many practices that were industry standards, for example wealth screening, data sharing, and data appending without informed consent (Shone, 2017). It also had a large impact on the content of privacy policies for organisations in terms of what had to be explicitly detailed for visitors (Shone, 2017; Amos et al., 2021).

Public awareness and discussion around the content of privacy policies is also increasingly important in a rapidly changing socio-political environment surrounding transparency and trust in online spaces (Amos et al., 2021; Macaulay and Bourne, 2002; Nissen et al., 2019). Public and governmental awareness of privacy violations are growing due to factors like media attention, new regulations, and scandals such as Cambridge Analytica (Shone, 2017; Amos et al., 2021; Brown, 2020; Isaak and Hanna, 2018). As such, privacy policies are an increasingly important way for organisations to communicate their practices with their stakeholders in terms of transparency, accountability, and building trust. Museums in particular face a unique challenge in meeting these social and political requirements due to their increasingly hybrid nature and need to report a wide range of data to funders (MacMillan et al., 2005; Shone, 2017; Selwood, 2002). Understanding how museums are working to achieve transparency and accountability through their policies (or not) can indicate how these political and social discourses are being implemented in practice.

Despite increasing legislative awareness of the importance of privacy policies, research shows that the majority of visitors to a webpage or organisation do not tend to read the privacy policies available (Fabian et al., 2017; Gilman, 2021; Amos et al., 2021). This lack of engagement stems from a societal-level understanding (Foucault, 2016; Barnes, 1992) that privacy policies are inaccessible and do not offer the possibility of informed consent (Fabian et al., 2017; Crabtree et al., 2016; Amos et al., 2021; Gilman, 2021). Privacy policies presented to web users have been described as complex, long-winded, ambiguous, and inaccessible to the average person (Macaulay and Bourne, 2002; Srinath et al., 2021; Slavin et al., 2016). Further, despite **GDPR** requirements, privacy policies are slow to adapt to the

socio-political environment (Macaulay and Bourne, 2002; Amos et al., 2021), and some organisations still do not have privacy policies at all. (Zimmeck et al., 2019) identified that 49.1% of apps on the Google Play Store do not offer links to privacy policies for users, and 31% do not appear to have any analysable privacy policy available at all¹². Where policies are available, they are also becoming increasingly more inaccessible to the average user (Gilman, 2021; Fabian et al., 2017; Amos et al., 2021; Macaulay and Bourne, 2002; Srinath et al., 2021). The median word count of privacy policies doubled between 2009 and 2019 and the median readability score (judged against the FleschKincaid grade level¹³) has increased substantially from 11.9 in 2000 to 13.2 in 2019 (Amos et al., 2021). Ambiguous language and omission of key data practices are also increasingly common (Amos et al., 2021; Slavin et al., 2016; Zimmeck et al., 2019). Ambiguous language can relate to the phrasing of terminology or references to external influences such as ‘third party’ data sharing or collection. Up to 77% of privacy policies in a study by (Srinath et al., 2021) included the phrase ‘third party’, although it is rare for a privacy policy to detail who the third parties are, what data they can access, or how the user can opt out of such data sharing (Libert, 2018). On occasion, omissions may be a simple error due to space saving efforts or unintended collection, however such mistakes are likely far less common than deliberately misleading omissions (Slavin et al., 2016). The inaccessibility of privacy policies to most users negates trust in policies, reducing likelihood of users reading policies, and subsequently reducing trust in organisations (Fabian et al., 2017).

Privacy policies within museums face many of the same shortcomings as those described above. However, exploring privacy policies within the arts and culture sector requires understanding the broader digital environment of arts organisations. For instance, many museums have been slow to adapt to the increasing necessity of an engaging online presence due to their constrained resources and limited ability to train a tech-savvy workforce (Museums Association, 2018; Murphy, 2019; Stam, 1993). Despite this,

¹² Zimmeck et al’s study analysed 1 035 853 English language apps from the Google Play Store in May 2019. The full data set is available at <https://usableprivacy.org/data>

¹³ The FleschKincaid grade level is a system developed by John P. Kincaid in the 1970s to score texts on their readability. The system ranks texts according to the level of literacy skill required to read it. The system is based on the average literacy levels of different ‘grades’ in the American school system whereby the higher the score, the harder the text is to parse. Kincaid recommended aiming for a level of 8 (equivalent to the literacy skills of an 8th grader).

particularly in response to the ongoing effects of the COVID-19 pandemic, an increasing number of museums are utilising websites to provide more meaningful online engagement - either as companion guides for physical visits or as standalone experiences. In 2018, 92% of **UK** museums were found to have a website available (Museums Association, 2018), and this number is expected to have risen over the course of the COVID-19 pandemic. In response to this, as well as in response to the introduction of **GDPR** in the **EU** and **UK**, many museums now provide privacy policies on their websites both for personal data collected online *and* that collected in the physical museum. However, due to the rapidly changing political and cultural environment combined with the relative stagnation of funding, the application of museum privacy policies is still responding to evolving regulatory and social requirements.

Investigating museum privacy policies offers opportunities to understand how both online and offline spaces are utilised by visitors and venues in a novel way. By examining the policies, we can begin to situate the arguments of the thesis within the relevant contexts. Presenting a snapshot of the current status of museum privacy policies cannot generate concrete conclusions about the status of data collection across all **UK** museums. However, the findings presented here allow inferences to be made about what museums understand personal data to mean, what personal data may be typically collected, how information about these practices are presented to audiences, and what the priorities of organisations may be in terms of what is overtly collected (and by absence, what is covertly collected).

4.2 Designing the Study

This study aims to deliver an overview of the current state of art museum privacy policies in the **UK** through a topic-modelling based content analysis of **UK** art museum privacy policies. This section outlines the methods through which relevant data was identified, collected, and analysed. This content analysis followed the steps laid out by (Schreier, 2014) in 3.3.2. First, the aims of the study and relevant background were established. Second, potential museums were identified and their privacy policies located. Privacy policies were then subject to inclusion and exclusion criteria to identify relevant samples. Included policies were manually scraped for personal data types, which were then subject to segmentation and coding to standardise and simplify the data set. This process was iterated and the coding frame modified until saturation was reached. Data types and data topics were then

scrutinised to provide an insight into priorities and data collection practices within museums.

4.2.1 Identifying Privacy Policies

A cross-sectional, purposive sample of museums were identified and their privacy policies collected between 3rd-4th February 2020 through a combination of web platforms and existing networks. Purposive samples use the researcher's discretion to choose samples based on typicality or interest (Robson, 2011). As such, three methods of museum identification were implemented to reflect the three most common ways members of the public would choose a museum to visit. The first method of identifying museums used web platform TripAdvisor¹⁴ – a globally used review site that hosts customer/patron reviews of services. TripAdvisor was chosen to select the bulk of the sample as it is a popular website that purports to offer the largest online overview of public attractions. Results offer a broad selection of sites with differing sizes, locations, and content types. The search term 'Art Museums' was entered to the site search bar and the results restricted to the **UK**. An initial selection of 50 sites were captured and recorded on a spreadsheet in Microsoft Excel, with the possibility of returning to include more if needed. The second purposive sampling method was selected to ensure that the **UK's** largest and most popular museums were included as examples that would be more likely to be meaningful to those engaging with the data in future studies. As such, a selection of museum sites were also acquired from an internet search using search engine DuckDuckGo to find 'Top Art Museums UK'. The first result- an article from TheCultureTrip¹⁵ – was selected. The Culture Trip article identified a further seven galleries that were not included in the original TripAdvisor search. The final purposive sampling method was to choose museums that are local. Two further museums were included that are local to Nottingham completing the list of 59 museums. The sample provided data saturation and so no further museums were identified or included after the first round of sampling. For each museum, data was entered into a spreadsheet containing museum name, website URL, organisation type, museum group or affiliation, date accessed, and where applicable, privacy policy URL, minimum number of 'clicks' required to reach the

¹⁴ <https://tripadvisor.mediaroom.com/uk-about-us>

¹⁵ <https://theculturetrip.com/europe/united-kingdom/england/articles/the-10-best-art-galleries-in-england/>

privacy policy from the homepage, and the data types explicitly identified as collected in the privacy policies. This spreadsheet is shared in Appendix One for validity.

4.2.2 Extrapolating Data from Privacy Policies

Once the 59 museums had been identified, the websites for each museum were visited and subjected to a six stage sequential process until the appropriate privacy policy was identified (Figure 3):

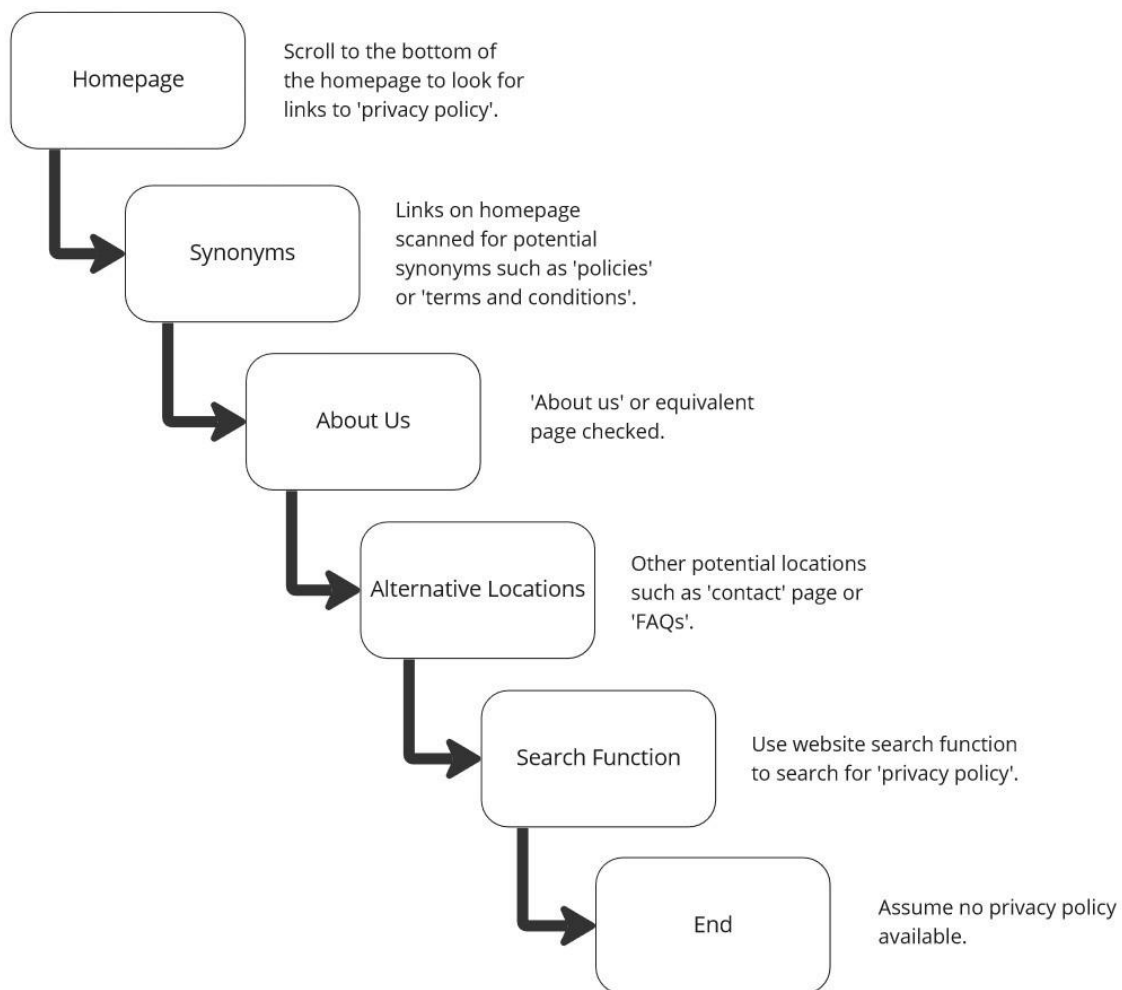


Figure 3. The Six Stage Sequential Process to Identify Privacy Policies

Inclusion criteria for privacy policies for this study were as follows. Only the policies relating to physical museum sites were included, with policies referring exclusively to the website rejected. If there were several privacy policies on offer, the one for the physical, main museum was used. In the case where a museum shared a web page with a larger museum

group the museum group privacy policy was used. In the case where the museum did not have a website and was on a third party site, for example some local councils or universities, policies were only included if they were specifically about the museum. These criteria excluded 13 of the 59 museums listed in Appendix One. A further two museums were revealed to have no privacy policy available, reducing the number of privacy policies analysed to 44.

4.2.3 Analysing the Privacy Policies

The analysis process followed a small-scale, manual method of topic modelling described by (Srinath et al., 2021) in 3.3.2 in which language is standardised, simplified, and categorised. Each of the 44 included privacy policies were read in full and manually scraped for data types explicitly mentioned. Data types were initially listed verbatim in a spreadsheet next to the name of the museum from which they were drawn, along with the other information detailed above in 4.2.2. Data types were then collated into a single list and language was standardised, for example where one policy used 'IP address' and another used 'internet protocol address', both were standardised to IP address. Aside from standardisation, data types are presented using exact wording as found in the policies. Data types were then iteratively categorised into broader data topics. Data types and data topics were then subjected to further analysis, the findings for which are presented below.

4.3 Findings

4.3.1 Accessing the Privacy Policies and their Content

Of the 59 museums initially identified, 20 had their own, unique policies, 24 had shared policies with other arts and culture organisations, 13 had generic privacy policies not specific to the museum, and two had no privacy policy at all. The 15 museums without specific privacy policies were excluded from the content analysis, but still provide some valuable insight as to missing information.

Seventeen of the 20 websites that had privacy policies unique to the museum primarily had links to their privacy policies available in one click from the landing page. Two of the 20 museums required two clicks – one via the 'about us' page, and one via a generic 'policies' page. One further museum required searching for the privacy policy via the search bar function. A small number of museums in this category had extreme examples of inaccessible

policies. One museum, for example, had separate privacy policies for visitors, website users, newsletter subscribers, supporters, shop customers, restaurant customers, donors, lenders, competition entrants, copyright holders, image licensees, archive and library users, visitors viewing works not on display, job applicants, staff and ex-employees, and volunteers. However, the majority of these 20 museums' policies were within the expectations set by the literature for legibility. For example, whilst the language used for most data types was relatively plain with some ambiguity or complexity, there was a considerable amount of ambiguous language surrounding third party data:

Your information may be shared with us by other organisations and websites, but only when you have indicated that you give your consent to hear from us. You should check their Privacy Policy when you provide your information to understand fully how they will process your data.

As well as ambiguity around other collection practices:

Information Available Publicly - This may include information found in places such as Companies House, your biography on your work website or information that has been published in articles/ newspapers.

Further, omitted information was also a consistent feature of these policies, including lack of reference to CCTV or social media and missing details on important practices such as what data is kept and for how long:

We will keep your information only for as long as is reasonably necessary for the purposes set out in this privacy notice and to fulfil our legal obligations. We will not keep more information than we need. The retention period will vary according to the purpose.

Of the 24 museums that shared privacy policies with other arts and culture organisations, 11 were accessible within one click of the landing page, eight took two clicks, two took three clicks, and three required using a search bar to locate them. Privacy policies written for arts and culture groups tended to be less specific in their descriptions of data types than those made specifically for each museum and contained higher levels of ambiguous language than

the specific policies. For example, one museum that was part of a museum group simply described their data collection as:

You can browse our website or make enquires at any of our venues without disclosing any personal information. However, if you choose to book tickets or workshops, register to be kept up to date with our events, or provide your personal data in any other form, we will only process your data in accordance with the relevant legislation. (...) If you choose to provide any details about yourself while browsing our website, you will be asked to consent to [museum group] collecting, storing and processing it.

This quote is representative of many of the culture group privacy policies that do not explicitly state what data types they collect. Group policies also tended to be harder to find, often having to navigate to a separate website for the group before they could be located. One privacy policy also had to be downloaded before it could be accessed. Often, policies of organisations that were part of the same group contained verbatim extracts from each other.

Thirteen museums had links to privacy policies that were not specific to the museum, and so are not included in the content analysis. Usually these policies referred solely to web visitors or linked to policies far broader than the museum, for example local councils, universities, or umbrella organisations. Over half of these policies were museums run by local councils. For two further museums, it was not possible to locate any privacy policy at all.

4.3.2 Data Types and Data Topics Identified in Privacy Policies

569 words or phrases pertaining collected data were extracted from the 44 policies. When subjected to standardisation and simplification (Srinath et al., 2021), this represented 110 unique types of data collected by the museums, as shown in Table 1. Terminology has been kept as close to original or most common phrasing as possible. Next to each data type is shown the amount of times it was explicitly mentioned across the 44 included privacy policies.

Table 1. Data Types Identified in Museum Privacy Policies Prevalence

Types of data	#
---------------	---

Address	34
Age	2
Analytics	1
Apps used	2
Art loans	2
Bank account details	11
Billing address	9
Biometric data	7
Browser plug-in types	3
Browser plug-in versions	3
Browser type	9
Browser version	7
Business interests	2
Car registration	1
CCTV	16
Children details	3
City	2
Clickstream	6
Contact details	7
Contact preferences	10
Cookies	31
Criminal history	2
Cultural preferences	1
Date of birth	14
Date of visit	2
Delivery address	2
Demographic information	3
Disability	7
Donation history	12
Download errors	2
Email address	36

Email interaction	4
Employment history	2
Employment status	1
Enquiries	1
Ethnicity	9
Event attendance	7
Family details	4
Feedback	13
Frequency of visits	1
Gender	10
Genetic data	7
Gift aid status	13
Google analytics	14
Health	4
History with museum	4
Hobbies	2
Interests	18
IP address	20
ISP	1
Job title	2
Language	1
Location	9
Location	8
Login data	5
Login details	1
MAC address	4
Maiden name	3
Marital status	3
Marketing preferences	17
Mental health	3
Name	35

Next of kin	1
Occupation	2
Operating system	6
Opinions	3
Organisation	3
Other technology on devices	3
Page interaction data	9
Page response times	2
Pages accessed	3
Partner details	6
Password	2
Payment card details	21
Philosophy	3
Phone number	28
Photographs	14
Physical health	3
Platform	6
Political opinions	10
Postcode	5
Preferences	10
Prefix	4
Profiling	6
Publicly available information	11
Purchase history	17
Racial origin	4
Referring website	4
Relationship to other members	2
Religion	8
Search queries	2
Sex life	4
Sexual health	2

Sexual orientation	8
Social media account	9
Supporter status	1
Survey responses	6
Technical	1
Telephony log	1
Third party	7
Ticket purchasing	3
Time zone settings	3
Title	7
Trade union membership	3
Username	3
Volunteer status	1
Web session duration	10
Web session time	7
Website visits	1
Wi-Fi usage	1

For further accessibility and transparency, this table is also presented in Figure 4 as a word cloud, where the frequency of the data type appearing in the privacy policies is represented by the size of the word, with larger words showing more commonly referenced data types.

Table 2. Data Topics Identified in Museum Privacy Policies Prevalence and Definitions

Category	Definition	% Policies Mentioning Topic	# Times Topic Appears
Identity Data	Any data that may capture identity markers of visitors	86	98
Contact Information	Any data that could be used to contact visitors	98	132
Engagement with Museums	Any data relating to the ways the visitor physically engages with the museum	59	57
Digital Behaviour	Any data relating to the ways the visitor digitally engages with the museum	23	15
Relationship to Others	Any data relating to other people the visitor may know	10	19
Billing Information	Any data about how the visitor pays for goods and services within the museum	80	73
Third Party	Any data that comes from a source other than the visitor or the museum	34	18
Images	Any data stored in image format	45	30
Background	Any data that describes the broader background or status of the visitor	55	50
Technical Data	Any data collected automatically when a user engages digitally with the museum	91	180
Special Categories	Any data classified as 'special category' data under GDPR	27	75

The most commonly referenced data topics were *Contact Information* and *Technical Data*, both of which were cited in over 90% of the privacy policies. These also represented the most frequently cited data types, with types of technical data and contact information appearing a collective total of over 300 times across the 44 policies. *Technical Data* was

often the least defined topic, containing the most ambiguous and generic language such as clickstream, page response time, or even just ‘technical data’ as data points. *Identity Data* and *Billing Information* were also extremely common, appearing in 86% and 80% of the policies respectively with 171 collective mentions. Least common was *Digital Behaviour* (including social media) that was mentioned 15 times across 23% of the policies, and *Relationship to Others* that was mentioned in just 10% of the policies. *Third Party* also had a very low frequency, mentioned just 18 times (with only digital behaviour mentioned less times), although the associated data types – ‘third party’ or ‘publicly available information’ was seen in 34% of the policies, relatively common, albeit still far below the 77% average shown by (Srinath et al., 2021).

4.4 Discussion

This chapter has so far presented the findings of a topic-modelling content analysis done on a cross-section of art museum privacy policies in the **UK**. The privacy policies detailed here were accessed through the same six stage process, each beginning on the homepage of the respective museum’s website and searching from there for the relevant policy. This discussion section is dedicated to unpacking these findings to determine what can be inferred about museum priorities regarding data collection practices (based on how frequently or infrequently different data types and topics are presented), and museum priorities in communicating data collection practices with audiences. In particular, the discussion focuses on drawing out themes of transparency and accessibility, as well as beginning to establish an understanding of the value different data might offer museums.

4.4.1 Transparency and Accessibility Regarding Data Collection Practices

One third of the 59 museums included in this study provided unique, specific privacy policies regarding their data collection practices. The vast majority of these were easily accessible within a single click of the landing page, and the information within was presented in terms of language and readability to the expectations set out by the literature in 4.1 (Macaulay and Bourne, 2002; Srinath et al., 2021; Slavin et al., 2016; Amos et al., 2021). However, museums who were part of a group or consortium tended to have less accessible policies requiring an average of two clicks, and containing more ambiguous language (Amos et al., 2021; Slavin et al., 2016; Zimmeck et al., 2019). Further, in line with the findings of (Zimmeck et al., 2019), several museums did not offer privacy policies for the physical

museum at all and their policies specific to web users were typically difficult to locate and required visiting external sites, often linking to local councils or universities. Privacy policies that are hard to find, use inaccessible or overly ambiguous language, or are even non-existent, suggests a lack of investment or care in broaching the topic of data collection with visitors. This attitude is increasingly unsustainable given the shifting public and regulatory discourses surrounding personal data (Passebois and Aurier, 2004; Nissen et al., 2019; Dowthwaite et al., 2021). Further, this attitude is also contrarian to the principles of openness and education that many museums rely on, particularly in reaction to the adoption of New Museological principles (Simon, 2010; Murphy, 2019; Duncan, 2002).

Museums part of a group or consortium tended to have privacy policies that were less accessible both physically and intellectually than museums whose policies only reflected their own practices. The affiliations of group/consortium museums are important to note as they represent real world links between organisations and suggest a diluted sense of accountability due to these connections, despite the clear guidance of **GDPR** to the contrary. This phenomena is even prevalent in instances where museums who were affiliated with another non-museum institution, such as local councils or universities, often lacked privacy policies at all, instead relying on the non-specific policies of their affiliates to be sufficient. When the accountability of the physical establishment is lessened through overreliance on uncritical technological solutions (such as shared privacy policies), this can lead to an equally uncritical, but arguably more dangerous, lack of attention to who such 'solutions' actually affect and how (Sicart and Shklovski, 2020; Lindtner et al., 2016). Even in mundane technologies like online privacy policies and websites, technosolutionist thinking can be seen to reduce perception of importance for creating something that is physically and intellectually accessible to all groups. This kind of thinking disproportionately affects those at higher risk of experiencing data violence when their rights are not built into technology (Hoffmann, 2020; Bardzell, 2010; Vorvoreanu et al., 2019).

4.4.2 Inferring Data Priorities of Museums from Types of Data Collected

The most commonly collected data type across the museums was email address (36), followed by name (35). Of the 10 most commonly mentioned data types, four are *Contact Information* (email address, address, phone number, marketing preferences), and only one (name) is *Identity Data*. This suggests that consistently usable data takes precedence over

familiarity with individual visitors. This is compounded by the prevalence of *Contact Information* appearing in 98% of privacy policies, compared to *Identity Data* appearing in only 86%. This demonstrates an intention for museums to pursue a long-term relationship with visitors through communication, but one that neglects any potential to enhance relationships between stakeholders using more meaningful or personable data. This is in direct contradiction to suggestions highlighted in the Literature Review that suggest that museums are shifting their priorities to be visitor-centric in order to build meaningful relationships (Geoghegan, 2010; Recupero et al., 2019; Eklund, 2020; Howes, 2015). One potential explanation for this disparity relates to the primary methods museums implement for data collection – mailing lists, events, and face-to-face surveys. Particularly in face-to-face surveying, museums are less likely to ask visitors for immediately identifiable data such as their name in order to preserve anonymity in as many ways as possible in line with **GDPR** (Shone, 2017; Amos et al., 2021). Further, in the implementation of the other data collection methods, ‘name’ is more likely to be submitted by the visitor voluntarily or as a ‘default’ piece of data, rather than as something actively sought by museums. In this scenario, data types like name may be less likely to be referenced in privacy policies as something actively collected, but rather excluded as something that is mundane and passively or incidentally collected. However, the same explanations may not apply to other identity markers commonly omitted from the policies such as gender, date of birth, or ‘profiling’ data. Regardless, whether data that could forge mutual relationships is deliberately not collected, or if it is simply not referenced in the policies, it demonstrates to readers an attitude of using visitors as a resource over conceptualising them as stakeholders, an attitude which can be detrimental to trust-building and relationship formation.

Data points explicitly mentioned only a small number of times also offer some insight into museum priorities and practices. For example, CCTV was only explicitly named in 16 of the privacy policies. *Images* as a topic that contained CCTV and photography were mentioned a total of 30 times in 45% of policies, where 10 of the 16 museums who noted CCTV also noted photography, despite most, if not all, museums collecting this data. This common exclusion is likely representative of the progressive social acceptance of surveillance type technologies (Taylor, 2017; Dowthwaite et al., 2021). Exploring such normalisation of surveillance technologies is beyond the scope of this PhD but is an important contribution to

understanding the ways that museums use their privacy policies to share their practices with visitors. Another factor to consider is that, to retain accessibility and readability, privacy policies cannot include every piece of data that is or might be collected. The omission of certain 'pervasive' or mundane technologies could therefore be explained as an outcome of maintaining a privacy policy that is shorter, and therefore more accessible (Macaulay and Bourne, 2002; Srinath et al., 2021; Slavin et al., 2016). However, as shown in the Literature Review, mundane technologies are not necessarily safer just because they are common, particularly for certain communities who may be more exposed to surveillance, exploitation, or threat (Taylor, 2017; Hoffmann, 2020). Further, the literature and this analysis shows that privacy policies are not necessarily designed with accessibility and readability in mind. Questions are subsequently raised around who defines what technologies are mundane and therefore omissible, whether users can understand implicit methods of data collection, and how such considerations can be re-appropriated to assist with education and fairness.

4.4.3 Exploring the Value of Data Topics to Museums

By a considerable margin (+48 data points) *Technical Data* represented the most frequently cited data type in privacy policies, and the second most commonly cited topic appearing in 90% of policies. The 32 types of data categorised as *Technical Data* were mentioned a total of 180 times across the policies, most commonly cookies (31), IP addresses (20), and Google Analytics. Google Analytics was mentioned 14 times, but was never explained in more detail within any of the policies in terms of what data was shared or the reason. In fact, *Technical Data* was almost always presented as a list of technical terms given without context or explanation (Amos et al., 2021; Slavin et al., 2016; Zimmeck et al., 2019). Similarly, 'third party' was also an uncommonly used and ambiguous term that appeared a number of times in the policies (7), often alongside publicly available information (11) as sources of data. At least one of the phrases third party or publicly available data appeared in 34% of the policies, meaning that a minimum of a third of the museums shared data with, or collected data from, undisclosed organisations whose data practices are unknowable to the user (Nissen et al., 2019; Chamberlain et al., 2017; Libert, 2018). Without explanation of how and why technical data is collected, which third parties or public information is involved, or for what purposes any of these data are used, the ambiguity of these phrases can raise

questions around trust and loyalty for audiences (Srinath et al., 2021; Slavin et al., 2016; Fabian et al., 2017). This ambiguity works against attempts to build trust between organisation and user by reducing the agency of the user and by increasing the appearance of dishonesty or exploitation (Amos et al., 2021; Slavin et al., 2016; Zimmeck et al., 2019; Libert, 2018). Building trust is vital to the long-term survival of arts organisations (MacMillan et al., 2005; Passebois and Aurier, 2004). Increasing trust increases willingness to share data, which in turn leads to the capacity for more meaningful and impactful outcomes (Tolmie and Crabtree, 2017) and improved funding (Caldwell, 2002). Transparency in matters such as data collection can therefore be an important tool as both a preventative measure against losing trust, and as an active measure towards building it (Nissen et al., 2019).

The least commonly referenced topic across the policies was *Digital Behaviour*, including social media, which appeared just 15 times in 10% of policies. This is surprisingly in contradiction with the literature that suggests social media is a prevalent tool used by museums to engage prospective *and* existing audiences (Weilenmann et al., 2013; Zollo et al., 2021; Easson and Leask, 2020; Ruggiero et al., 2021; Kidd, 2011). This may be a reflection of the rapidly evolving nature of social technologies and the slow evolution of privacy policies in keeping up with such changes (Zimmeck et al., 2019), although it may also suggest more sinister, opaque data harvesting excluded from privacy policies as ‘public domain’ information – although as established, publicly available information is also an uncommon listing within the policies. The topic *Engagement with Museums* was also limited in the references made to it, appearing 57 times across just 26% of the policies. This topic included quantitative data commonly requested by funders such as frequency of visits and event attendance, and qualitative data such as feedback and opinions. The underrepresentation of this topic is surprising and highlights two possibilities. First, that museums are unable to collect some of the more qualitative types of data included in an efficient way (Selwood, 2002) (although this option does not explain the missing funder data), or second, much like *Images*, such data collection is deemed mundane and therefore unnecessary to be referenced in the privacy policies. Nevertheless, it is a surprising omission given that it is fact that all **Arts Council** or government funded museums in the **UK** must collect at least some of this data. The disconnect shown between reality, expectations, desires, and privacy policies in just these two categories is stark. Both *Digital Behaviour* and

Engagement with Museums as topics were expected to be much more prevalent in the dataset than they were, but both are widely omitted or watered down.

The final topic to be highlighted in this discussion is that of *Special Category* data. Special category data requires different, enhanced protections than other data under **GDPR** and include data types such as ethnicity, religion, sexual orientation, and biometric data (Information Commissioner's Office, 2022). Despite these additional protections, *Special Category* data was more frequently referenced in the policies than billing information at 75 to 73, although it did appear in less of the privacy policies overall (27% to 80%). Although **NPOs** are legally entitled to process this data under **GDPR**, it is unclear why special category data was so commonly collected by museums, as none of the policies disclosed why it was collected, nor what further safeguards were implemented to protect this highly sensitive data. Once again, this lack of transparency risks undermining relationships between organisation and visitor and is once more particularly high-risk for marginalised groups whose protected data may be of a higher value (Coleman, 2018; Taylor, 2017; Hoffmann, 2020; D'Ignazio and Klein, 2020).

4.4.4 Overcoming Limitations

This study used content analysis to analyse collected data. Content analysis is a useful tool for taking large amounts of information and categorising them into more accessible topics that can then be explored comprehensively and meaningfully (Tight, 2019; Schreier, 2014). Whilst this process can be beneficial to enable deeper engagement with datasets, it also risks losing some nuance during the categorisation process. This is mitigated through the inclusion of the full dataset within the findings and discussion as well as the analysed data topics. Further, this study provides the groundwork for the proceeding studies in which the data analysed here is opened up again for nuanced discussion with stakeholders, minimising the risk of overlooking details.

4.5 Contributions to the Conceptual Framework and Summary

This study was designed to establish the groundwork for tackling the thesis questions. Privacy policies of **UK** art museums were subjected to a content analysis to highlight insights into the priorities and practices of museums regarding the collection, use, and

communication of audience personal data. These findings are summarised here and explicit contributions to the conceptual framework are demonstrated in Figure 5.

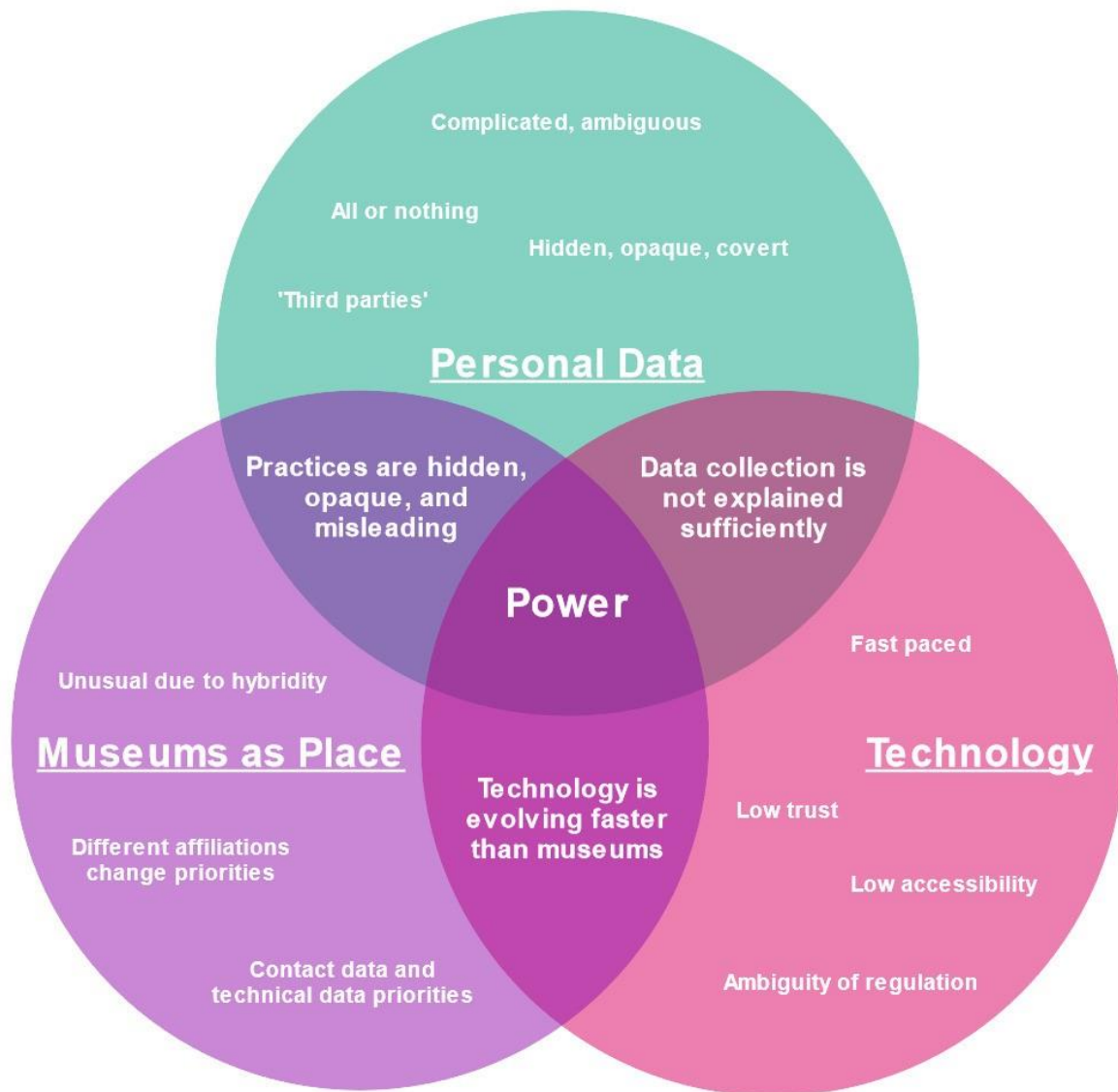


Figure 5. Venn Diagram of Conceptual Framework Contributions from Study One

The study demonstrates that museum privacy policies are in many ways typical – most contain inaccessible, ambiguous, and complex language that prevents audiences from fully engaging with them. With the attitudes of the general public and regulators shifting towards enhanced transparency and accountability within data collection, the lack of these attributes becomes more and more unsustainable in the mid- to long-term. However, as regulations and societal attitudes to data change, most **UK** museums are in an atypical

position in that they are hybrid organisations, which raises new challenges for communicating data practices with audiences. A combination of limited resources, funder requirements, and different affiliations also contribute to these challenges as museums have more barriers to overcome to adapt to and communicate changes than other organisations might face. However, regardless of these challenges, museums and funders do ultimately choose what personal data is collected and what is done with it within their organisations and as such, have a responsibility to make these practices knowable. Further still, the study highlights a high probability of museums deliberately excluding some data collected from privacy policies, as the least popularly referenced data topic was behavioural data that includes data highly prized by funders and museums alike. This negligence is further demonstrated by the collection of large amounts of other, often ill-defined or ambiguous data which may be shared with 'third parties' for undisclosed purposes and ad hoc mentioning of special category data, without details of why this data is collected or the additional protections required. As such, museums must work to better conceptualise and communicate with their audiences what they are collecting and why, treating data collection as an opportunity to build trust and loyalty with audiences and to empower them to better conceptualise their data. This has further impact as it ties into museum priorities to affect social and cultural discourses, providing opportunity to reshape the narratives surrounding attitudes to personal data on a broad scale.

5.0 Understanding the Needs of Museums and their Staff: Study Two

5.1 Introduction and Background

This chapter presents a workshop conducted with museum staff (**MS**). The workshop builds on the results of study one (*S1*) by bringing in the perspective of **MS** to further contextualise how data is collected and used, to highlight what desirable data is not collected, and to establish what makes that data desirable but elusive (Figure 6). **MS** were asked to complete multiple activities regarding their institutional practices as data collectors and to consider how future practices could be more beneficial to the organisations and their **audiences**.

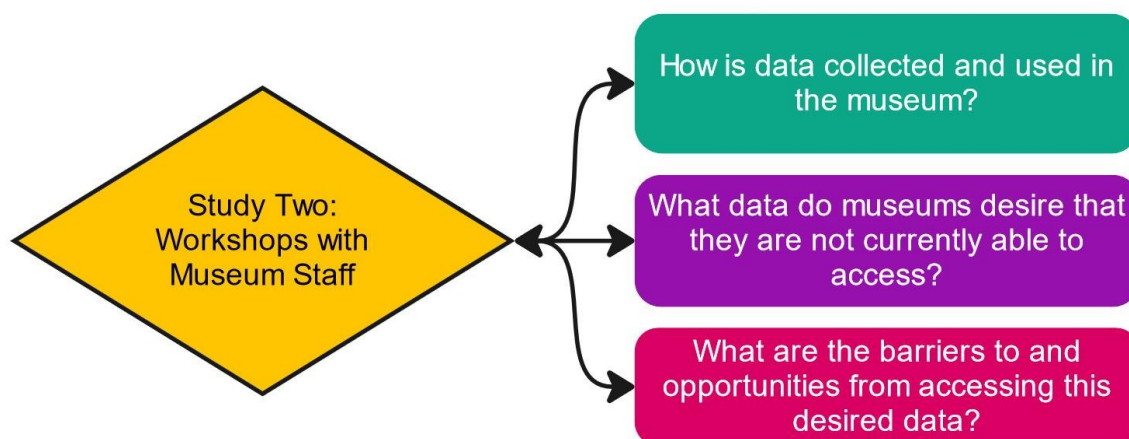


Figure 6. Sub-questions Addressed in Study Two

To achieve these aims, it is vital to understand the broader power structures within which **museums** operate. As described in 4.1, the General Data Protection Regulation (**GDPR**) is a contemporary example of a change in law that deeply affected the arts and culture sector. **GDPR** sets out seven principles for the collection and processing of data: lawfulness, fairness and transparency; purpose limitation; data minimisation; accuracy; storage limitation; integrity and confidentiality; and accountability (Publications Office of the European Union, 2016). However, it also establishes legal obligations for processing personal data including gaining informed consent (and providing easy options to withdraw consent), protecting vital interests of data subjects, and protecting special category or sensitive information (Publications Office of the European Union, 2016). As part of these legal obligations **GDPR**

establishes the concept of ‘legitimate interest’, in which the data controller or processor can process an individual’s personal data without informed consent if the organisation has ‘a legitimate interest to process the data and that there is no other, less intrusive way to achieve the same result’ (Reuter, 2018: 14). The enforcement of **GDPR** has been inconsistent, and due to the ambiguous language used in the regulation, organisations have interpreted elements of the rules according to their own needs. While organisations within the **EU** and **UK** are encouraged to adopt additional safeguards to compliance such as codes of conduct, certification, and employing independent supervisory authorities, the only means of government enforcement comes from the threat of fines if an organisation is found to repeatedly breach **GDPR** laws (Reuter, 2018).

In the **UK**, **GDPR** came into effect in 2018. The ambiguity and poor regulation of **GDPR** led many not-for-profit organisations (**NPOs**) to struggle to adapt as their unique requirements regarding data collection and usage as **NPOs** were not overtly addressed within the documentation (Shone, 2017). Arts and culture organisations are further limited by lack of resources and expertise, which can slow the accommodation of legal changes (Steel, 2012; Caldwell, 2002; Falk and Needham, 2011; Oakley, 2009; Allen and Petterson, 2016) and force resources to be redirected away from meeting other social and cultural obligations. This can subsequently lead to the torpidity criticised by academics and members of the public (Lynch, 2013; Duncan, 2002; Vermeeren and Calvi, 2019; Simon, 2010); not in response to reticence to change, but in fact in response to forced inaction.

The workshop began by presenting **MS** with a definition of power. Participants were asked throughout the workshop to reflect on the power of museums and the responsibilities that come with that power. Four kinds of power emerged from the discussion: data, museums, audiences, and other **stakeholders**. Further themes around data, change, and opportunities were also identified. The rest of this chapter is dedicated to describing the design of the workshop, and presenting these findings in depth.

5.2 Designing the Study

The design of study two was directly influenced by the findings of the content analysis in **S1** (4.3) that inferred priorities and practices of museums in regards to data collection and use. **S1** also raised questions surrounding what data is not collected that could be beneficial to

different stakeholders. The second study used these findings to generate activities and provocations to present to **MS** and encouraged them to further expand on *why* certain data is prioritised, to compare the practices unveiled in the privacy policies with the actual processes of the museums, and to get a better understanding of what vital data is missing. This section describes the process of designing, running, and analysing this workshop with **MS**. The workshop was approved by the University of Nottingham's School of Computer Science Research Ethics Committee in September 2019.

5.2.1 Introducing the Museums

Four staff members from three museums took part in the workshop. A short description of each organisation is presented for contextualisation:

- Museum one is a contemporary art gallery that showcases international contemporary art and maintains strong connections with various universities and schools for educational outreach and research.
- Museum two is a university based art gallery and museum that offers a range of activities and events for all different audiences.
- Museum three presents itself as a creative space that focuses on culturally diverse contemporary arts and engagement with a range of communities.

The museums were identified with the assistance of staff at Nottingham Contemporary and invited to participate by email. Museums were selected primarily based on locality to ensure availability, and through the established networks of my mentor at the Nottingham Contemporary to provide an entryway to networking with museum professionals. Whilst those chosen represent a small selection of museums within the same geographical landscape, the three organisations selected offered a wide array of art museum types, priorities, and audiences as shown in the museum descriptions. This was deemed vital not only to account for a broad range of experiences, but also to provide the museums with a platform to engage with different power hegemonies during discussion. In order to take part, **MS** were asked to have an active role in the shaping of the data policies for their respective institutions. The representatives of the museums worked in roles relevant to marketing, development, communications, audiences, and partnerships. Each has been pseudonymised for the purpose of this thesis:

Museum one – Chris

Museum two – David and Matt

Museum three – Jodie

5.2.2 Running Workshops with Museum Staff

Workshops are a common method employed across disciplines, methodologies, and practices because of their flexible, exploratory, and participatory nature (Rogers, 2010; Kesby, 2005). Workshops bring together groups of participants who share a common domain, work in the same field, or who share relevant agendas to discuss a specific issue or topic (Ørngreen and Levinsen, 2017). Beyond these fixed elements, workshops are dynamic and fluid and can be applied to a wide range of different scenarios. Typically, workshops provide participants with prompts and activities to complete that generate the bulk of the texts to be analysed. As well as written texts, the interactions between participants provide valuable insight into discourses, signs, and micropractices.

One defining feature of workshops is that they are conducted within a shared space. Be it physical or virtual, the activities and discussions undertaken between facilitators and participants encourage the creation of a communally experienced *place* in which mutual experience can be explored (Ørngreen and Levinsen, 2017). The participatory nature of workshops makes this created place a platform for the voices of different stakeholders involved (Jewitt et al., 2020), particularly important for those whose voices may otherwise go unheard. Whilst workshop spaces can mimic the power dynamics, signs, and micropractices that constitute the physical space workshops are conducted in, by drawing participants out of their daily life and into a specially curated *place*, their typical processes can be disrupted in order to provoke different modes of thinking, different practices, and innovation (Ørngreen and Levinsen, 2017; Kesby, 2005). The embodiment of a new place has the further benefit of disrupting power imbalances that may be prevalent within the same group of people in another space, for example a workplace or social environment (Kesby, 2005). This needs to be carefully managed by a facilitator in order to not simply replicate the power dynamics of existing cultural, social, or historical influences, but instead to provide a different kind of place capable of re-empowering the participant (Kesby, 2005). Indeed, it should also be a vital consideration that the work towards re-empowering within

this place should be encouraged to be adopted back within daily life, although this is not an easy thing to achieve (Kesby, 2005). One means of achieving this might be in facilitating the creation of shared language and shared understanding of phenomena that enables problems identified during workshops to be addressed beyond the workshop environment (Ørngreen and Levinsen, 2017).

Data can be collected from workshops in multitude ways depending on the discussion, activities, and research priorities surrounding the workshop. Examples of data types include video or audio recordings, written material, created artefacts and media, and facilitator notes. Data collected from workshops represent the opinions of the participants and so must be analysed in a way that is cognisant of the dynamic interactions between those participants. Reflexive thematic analysis is one method of analysis that enables contextual and flexible analysis of multimedia data sets.

The workshop ran for two hours on the 9th October 2019 and was hosted onsite by one of the participating museums. A copy of the information sheet and consent form can be found in Appendix Two. Hosting the workshop in a museum space was deemed vital to the workshop as this would, as well as responding to the points established above, encourage participants to ground discourse and innovation within the tangible context of a museum. Further, it was expected to encourage any outcomes of the workshop to be more easily transferable to other museum spaces. Limited spaces were offered to participants in order to create room for in depth discussion about topics.

The workshop was a semi-structured discussion guided by organised activities that tackled different elements of personal data in museums. The first activity asked **MS** to write on post-it notes types of data their organisations collect from **visitors**, and types of data they know other organisations to collect. This activity helped to establish a baseline of knowledge from each staff member. **MS** were then presented a word cloud of the data types found in the privacy policies in **S1** (Figure 4) and were encouraged to discuss any data types that aligned with expectations or that were a surprise. The second activity asked **MS** to categorise the post-it notes into data topics that we collaboratively compared to the data topics established in **S1**. This activity was designed to provoke **MS** to critically consider the meaning of different data and how it contributes to their organisations. We then discussed where personal data comes from, how consent is established, and how data is stored as a

bridge to discussions around transparency and accountability. The third activity required **MS** to discuss and write down how each organisation uses personal data internally. This led to the fourth activity in which **MS** were encouraged to speculate on what kinds of data they would *like* to collect that they do not currently have access to. This activity encouraged both practical and speculative suggestions and aimed to understand what currently missing data has value and why. The final activity then asked participants to rapidly speculate on how this missing data *could* be realistically and imaginatively collected.

Activities were completed on paper and post-it notes that were collected and documented as a .docx. The full workshop was recorded on Dictaphone as a .mp3 and transcribed into .docx format.

5.2.3 Analysing the Data

A reflexive thematic analysis was conducted on the full transcript and on the collated activity data using manual techniques paired with QSR NVivo (version 11) for Windows. Common themes were extracted from the data following the guidance of (Braun and Clarke, 2006) from their foundational work and follow up works (Braun and Clarke, 2019; Braun and Clarke, 2020) as detailed in 3.3.3. Reflexive thematic analysis makes use of researcher positionality in analysis of the data. An overview of relevant positionality elements is provided in 3.1. I utilise a post-structural feminism lens to conduct the analysis, meaning elements of the data surrounding power, marginalisation, and structural inequalities will be foregrounded within the findings.

5.3 Findings

Five themes were inductively developed from the reflexive thematic analysis and form the structure of this findings section:

Table 3. Reflexive Thematic Analysis Codes and Descriptions (Study Two)

Theme	Description	Nodes
How Power is Experienced in the Museum	References to the power of personal data, museums, audiences, and other stakeholders respectively. Examples of explicit or implicit power structures being perpetuated, experienced, or resisted.	Data has power to represent and repress
		Museums have power to assign narratives
		Audiences have power to... Not visit
		Other stakeholders have power to define the museum
Data Collection and Usage in Museums	References to how data is collected in museums including hidden or covert practices. This includes how data is used by museums both for internal and external purposes.	Data collection in museums is both complex and overly simple
		Data collection affects everyone in the museum
		Data collection affects stakeholders differently
Data Collection Technologies in Museums	References to technologies being used or implemented in museums that collect, analyse, or use personal data. General sentiments towards these technologies including towards speculative technology use.	Technology is increasingly used in museums to collect data
		Data collection technology use is often received negatively
How Museums Change over Time	References to change, including barriers and opportunities, either within the museum (e.g. in response to changes in regulation or legislation) or in reaction to the museum (e.g. due to educational outreach programmes or content).	Museums perform many roles in social change
		GDPR was a burden on museums that is still felt
		Museums face a broad number of barriers to change

Potential Futures for Museums	References to speculative, ideated, or concrete ideas of what museums may look like and the roles they may perform in the future. This includes opportunities that may arise in the future, and barriers that may prevent these futures from happening.	The future of museums is bright and technological
		Museum longevity faces many complex barriers

5.3.1 How Power is Experienced in the Museum

The session began by presenting **MS** with a contextualising quote about power from Michel Foucault:

Each society has its regime of truth, its “general politics” of truth: that is, the types of discourse which it accepts and makes function as true; the mechanisms and instances which enable one to distinguish true and false statements, the means by which each is sanctioned; the techniques and procedures accorded value in the acquisition of truth; the status of those who are charged with saying what counts as true. (Foucault, cited in Michener et al., 2013: 86) (Emphasis added by researcher)

MS were encouraged to discuss the quote within a broader understanding of power and what it might mean for personal data, data subjects, audiences, and the museums. **MS** were also encouraged to consider power throughout the entire workshop and as a theme it emerged in several different ways. Four subthemes relating to power were identified from the discussions that can be broadly understood as data power, museum power, audience power, and other stakeholder power.

The power of data was understood by **MS** as a power wielded by museums and which affected audiences. **MS** discussions of the power of data were generally presented under a legislative lens, although there was also discourse between **MS** around the discrepancies between legal requirements and their own ethical expectations. In discussing the power of data to represent visitors, there was an awareness of how it could be used to the detriment of the data subject and the power and responsibilities this gave to the museums:

Chris: But all of it, you know, data doesn't just work in isolation, if you've got a postcode and someone's gender and everything else, it isn't that difficult for people to start to work out who people are if that data gets out (...) But it's that idea that you're gifting something to somebody, right, you're gifting a part of yourself, an actual part of yourself, part of your identity, to somebody. And from my perspective, you know, if someone's giving you a gift, you ought to treat it preciously

However, data power was primarily conceptualised as a valuable asset for museums to use to further their own goals. Museum power was the most commonly discussed and emerged in a multitude of forms. For instance, **MS** were aware of the power their institutions held and perpetuated in ways such as advertising to audiences, curating content, and conducting outreach programmes. The awareness of their power and the ways they consciously wielded it was understood and justified because of the **NPO** status of their organisations:

Chris: ... having that relationship with, being at the forefront of power and how power is defined and all those kind of things, I think the ethics of data collection is... Is what fascinates me, because as someone who's worked in data-led marketing, one of the reasons I sleep at night [laughs], is because I only ever apply what I've learned from that data-led marketing to non-profits, or educational organisations, or charities, or whatever, because I know I'm not clawing away people's money, or I'm not exploiting them

This justification was generally understood by **MS** to mean that museums could collect any data provided they followed the law. As such, this attitude was also used to justify modes of data collection they considered more morally grey such as profiling, data scraping, or storing data for long periods of time. Audience power was talked about the least and was usually discussed in terms of audiences choosing to visit the museums or not and how the museums could reach out to missing or under-represented audience demographics more effectively. Only one of the museums demonstrated success in this sense through involving communities actively in their museum's content:

Jodie: I don't think we do so much, just because our aims are more to reach those people in the community who wouldn't come to art galleries? So we need to be looking at what they want, we have a show in our [museum] that's basically made from, by people in the community, they create the show, they work with our community team to choose what they want to showcase and who they want to showcase and how they want to showcase it

MS were aware of the power that their institutions held over audiences, but also discussed at length the limitations they experienced in exercising that power in light of reporting or

accounting to other stakeholders. The findings from **S1** showed that museums collect a wealth of data types that are shared with ambiguously defined 'third parties'. In **MS** workshops, several of these third parties were identified. One example was of museum groups or consortiums who were conceptualised as drivers of data collection and were discussed as useful sources of data and data analysis/storage. Third parties specifically engaged by individual museum with analysis and storage capabilities were understood to offer benefits to the museums, but not to audiences:

Matt: We also have a slightly strange one, because we're part of [consortium], so the box office system we have is a shared box office system, so I could log in now and look at customers of [local businesses], now all of that is covered in our privacy policy and their privacy policies, and it only is top level information, so you can see name, you can see address, you can see email, but you can't see what they've purchased, what they've gone to, what they've donated

The third parties identified that were considered generic to most museums were Arts Council England (**ACE**), the Department for Culture, Media, and Sports (**DCMS**), and Google. These organisations were not explicitly referred to as stakeholders by **MS** but were shown to be an important part of collecting and analysing data that museums did not have the resources or infrastructure to do themselves, for example profiling audiences or collecting information about foot traffic and behaviour in the museums. **ACE** and **DCMS** were both predominantly conceptualised as burdensome for requiring a large commitment of resources for little non-economic return, where Google was discussed as a purely positive source of analytics for its ease of use. None of the **MS** highlighted any ways in which these external organisations used visitor data to benefit the visitor. Indeed, discussions about the power that audiences might hold or how audiences could be empowered to become equal partners, even in discussions pertaining their own data, were non-existent.

5.3.2 Data Collection and Usage in Museums

Of the different stakeholders identified in the workshop, three were far more heavily referenced than others: the museums themselves, the visitors, and **ACE**, with any residual

stakeholders being delegated as ‘other’. When talking about their own data collection practices, **MS** discussed the data that their organisations collected and used extensively and in depth. Part of this discussion involved two facilitated activities that asked **MS** to identify the data types that their museums and other cultural organisations collected and to categorise them into topics. **MS** identified 47 data types that they believed museums frequently collected from their audiences. They then categorised the data types into broader data topics, mimicking the content analysis completed in **S1**. All 47 data types are listed in Table 4 along with the topic **MS** put each type into and the topic assigned during the previous content analysis.

Table 4. Data Types Identified by Museum Staff and their Assigned Data Topics

Data Type	MS Assigned Topic	Researcher Assigned Topic
Address	Marketing information	Contact information
Age	Demographic information	Identity data
Artistic background	Relationship data	N/A
Attendance	Events related/engagement	Engagement with gallery
Behaviour	Audience behaviour	N/A
Billing address	Marketing information	Billing information
Browser version	Digital/online data	Technical data
Business activity	Demographic information	Background
CCTV	Audience behaviour	Images
Charitable giving elsewhere	Relationship data	Third party
Charitable giving with us	Relationship data	Engagement with gallery
Complaints	Complaints	Engagement with gallery
Consent for marketing	Marketing information	Contact information
Cookies	Digital/online data	Technical data
Date of birth	Demographic information	Identity data
Decision for attendance	Audience behaviour	N/A
Demographic	Demographic information	Identity data
Device type	Digital/online data	N/A
Disability	Demographic information	Background

Donation history	Relationship data	Engagement with gallery
Email address	Marketing information	Contact information
Employment status	Demographic information	Background
Ethnicity	Demographic information	Special categories
Facial recognition	Audience behaviour	N/A
Gender	Demographic information	Identity data
Geo-demographic profile	Demographic information	Background
Group size	Events related/engagement	N/A
Impact	Events related/engagement	Engagement with gallery
Interests	Marketing information	Background
Life history	Demographic information	Background
Lifestyle preferences	Demographic information	Background
Marketing channels used	Marketing information	Technical data
Mobile device ID	Digital/online data	Technical data
Name	Marketing information	Identity data
Phone number	Marketing information	Contact information
Photographs	Demographic information	Images
Postcode	Demographic information	Identity data
Preferences	Demographic information	Background
Reviews	Complaints	Engagement with gallery
Sexuality	Demographic information	Special categories
Social media profiles	Digital/online data	Digital behaviour
Socio-economic background	Demographic information	Background
Spending	Events related/engagement	Engagement with gallery
Visitor behaviour (tracking via Google)	Audience behaviour	Technical data
Wealth (screening)	Marketing information	N/A
Website data	Digital/online data	Technical data

MS identified eight topics from the data types, seven of which are shown in Table 4; demographic information, marketing information, events related/engagement, audience behaviour, digital/online data, relationship data, and complaints. The eighth topic, personal knowledge and uncontrollable data, stands as an anomaly with no data type categorised into it by **MS**. This final topic was defined by **MS** as informal knowledge discussed and shared within organisations about specific visitors. In particular, personal knowledge and uncontrollable data related to high-profile financial supporters. This category was not identified within privacy policies but was cited as an important source of data by the **MS**:

Chris: It just makes me nervous because so much of the work that we do is based on personal relationships, based on people going to school together years ago, that kind of thing, people knowing artists... And it's the necessary way that curators work, (...) that's fine, it's just, you know, that's the one area of data control, as a data controller, that I feel I have no control over

The other seven topics identified by **MS** were similar to those identified in **S1** with two notable differences. **MS** assigned 'complaints' to their own topic, where I included that in engagement with galleries. **MS** also identified a category of 'audience behaviour' with three data types (decision for attendance, facial recognition, and behaviour) that did not appear in the privacy policies analysed in **S1**. The other two data types assigned to this topic were CCTV and visitor tracking via Google. Two of the museums noted using technologies provided by Google to access and analyse data about how audiences and visitors learned about the museum, how they travelled to the museum, how they travelled around the museum, and so on. One museum gave a specific example where they use a Google 'dongle' to capture the IP address of people who had used Google to search for opening times, and compare these with IP addresses of phones that entered the building. Important to note, all of the methods of capturing audience behaviour mentioned are captured *from* the visitor, and not *with* the visitor. Specifically, existing behavioural data sets are captured by proxy through technologies that have been implemented in the museum for other purposes such as security and marketing, and none are captured from actively including the audience in their experience e.g. through interactive exhibits or feedback mechanisms. This may go some way to explain why audience behaviour rarely came up in the privacy policy content

analysis, although it emerged as an incredibly important source of data for **MS** throughout this workshop, and as something that **MS** were actively seeking to better be able to capture in formal, documentable ways:

Matt: Behaviour, I suppose, audience behaviour data, things that allow us to infer what they may or may not respond to, and we would use that both for analysis in order to guide programme and organisational development, but also to inform targeted marketing going forward

The value of behavioural data was high to **MS**, but they described being unable to pursue it in and of itself as their organisations did not have the money, infrastructure, or analytic power to collect behavioural data as a primary goal. In line with these priorities, discussion surrounding visitors as stakeholders in personal data collection was limited. Visitors were usually discussed in terms of their legal rights:

Chris: I think it's about intent, and it is about the organisation having the mind-set that the owner of that data is the priority, not you as a business, and if they turn around and say 'delete it', or 'send me what you have on me', then you have to be ready to respond to that

Other discourse surrounding visitor personal data focused on the limitations of resources museums had to collect and use the data, and on what they would use such data for. In one activity, **MS** collaborated on a list of how data is currently used within their museums. Table 5 shows the data uses identified by **MS** and how many of the three museums present used data for that purpose.

Table 5. Data Uses in the Museum

Data used for	# Museums
Profiling	3
Targeting	3
Programme development	3
Outreach	3
Reporting	3
Funding	3

There was a high level of consensus as to what data was used for across the different museums, with only curation not being employed by all three. Two of the museums said that data collected from audiences did not affect their curatorial decision, whilst the other said that audience data was central to the way they curated content and exhibitions:

Jodie: we have a show in our [museum] that's basically made from, by people in the community, they create the show, they work with our community team to choose what they want to showcase and who they want to showcase and how they want to showcase it, so I think there's a really strong, for [museum], there's a really strong effect on the programme based on what the audience want

Aside from curation, data was used by all the museums for the same purposes; a basic understanding of who was coming to the museum, advertising to appropriate demographics, developing outreach and education programmes, and reporting back to investors and funders. Usage of data is therefore restricted to practical applications that primarily benefit the museum. None of the **MS** talked about using personal data onsite for creating engaging experiences, or for using it to enhance meaning-making for visitors. Further still, there was no indication of using data to feed back to audiences in any way.

Funding bodies were a common discussion point around data collection, in particular **ACE** who provide funding to all of the museums represented. Much like other funders such as the **DCMS** or local councils, **ACE** requires regular communication with organisations it funds including self-evaluation and reporting, questionnaires, surveys, and audience data (Arts Council England, 2021b). One method of evaluation by **ACE** that was heavily referenced during the workshops was the **Audience Agency's** Audience Finder survey. Often, the mandated data collection was branded as burdensome both for the museums and their visitors:

Chris: ...you know, we were making people stand at our front door after they'd just seen the exhibition for 15 minutes to ask them a six or seven page [Audience Finder] survey, and there were questions in there that

made me wince, when I sat, I mystery shopped before I went for the interview, and did the survey, and I was like Jesus, you know, they were asking me my sexuality, they were asking me how much money I'd spent that day, all these kind of things, and then when I got in and asked the marketing team, I said so how's that data actually used, what do we get from that, and they were like 'oh, no, we just, we do an audience report every season'

Matt: It puts a real burden on... The increasing demand on capturing data, specifically around the demographics of those people engaging with you, are the types of things that lead to what Chris was talking about earlier, which is where you have a 10 minute survey about relatively, a relatively intrusive survey about who somebody is which has the consequence of potentially having a negative impact on their experience over all.

Moreover, the outcomes of the data analytics provided by the **Audience Agency** were not useful to the museums, failing to provide insights on topics the museums were interested in such as hard to reach audiences and motivations for visiting. The burden of reporting data therefore was discussed as resource and time intensive with few tangible impacts for the museums.

5.3.3 Data Collection Technologies in Museums

Technologies employed in museums to capture data from visitors are rapidly evolving and this was heavily reflected in the discussions of **MS** who admitted to struggling to keep up with and underrepresenting such technologies to visitors:

David: In fairness, I'll hold my hands up here, if there's one thing that is underrepresented in our privacy notice, is cookies and information gathered through engagement with our online platforms. In fairness to us, we never track that back to the individual, and as of yet don't do any social re-targeting.

Two of the museums discussed having utilised Bluetooth or Wi-Fi to monitor how visitors physically navigated the museum space and the behaviours of visitors onsite. The two museums who used this technology talked about how valuable they found the information

that came from it, however, both also discontinued the use of tracking technology in their museums after only a short amount of time citing cost of upkeep and resources needed to make raw data meaningful as reasons. Another technology that was discussed as having a secondary function of data capture was the installation of contactless payment donation points being installed to compliment traditional cash donation boxes and to supplement falling income from funders. One of the **MS** explained that they had recently implemented this in their museum, to which another of asked them to let them know if it made any notable impact. However, other existing data capturing technologies were not always acknowledged as explicitly. For instance, social media was rarely mentioned by **MS**, despite all three organisations being active on multiple social media platforms. The only time social media was raised as a potential data capturing technology was in a list with other digital technologies, suggesting either rejection of the data available, or dismissal of its importance as mundane and socially accepted:

Jodie: Perhaps digital, online, I think that's quite an important category to stick together, just because it might not be as clear to people that you are collecting that data, and also it's used in a very different way to other data collected I feel. So I think that's a good category.

(...)

Matt: Actually one thing we haven't talked about there is response, so thinking about digital, we talk about engagement, social media, all the response rates to emails, what people are clicking through on, all the stuff that, you know, whether they've bought tickets following receiving a brochure, all that sort of stuff

While mundane technologies like social media were underrepresented in discussions, novel technologies for data capture were more broadly discussed in terms of both opportunities and risks. Facial recognition, for instance, was raised a number of times as a technology that **MS** could see potential future applications for, but which was also described as scary and potentially immoral. One specific example raised by David talked about a controversy that arose from a **UK** museum using facial recognition technology in 2018 without sufficiently informing visitors of its use. All **MS** condemned this behaviour, but were unable to

conceptualise why withholding this information from visitors is different from withholding information about general data collection practices. Indeed, while technologies already used by the museums were framed as mundane, the bulk of the discussion around data capturing technology looked to what might be possible for museums in the coming years:

Chris: I do think there's a role, and maybe we'll get into this a bit, but I do think there's a role for our organisations to not only utilise those tools, but to actively critique them at the same time.

While **MS** were aware of the limitations their museums face with available resources and infrastructure, there was an underlying assumption that more technologies would become available and useable to them in the future both financially, and technically.

5.3.4 How Museums Change over Time

Another common theme that came up in the workshop was the capacity that museums have to affect change on different scales. **MS** were aware of the impact that their institutions had on individuals, communities, and even broader society and the responsibility that came with that:

Chris: I think (...) there's a role for museums to be more than just a place you visit, but to be a kind of platform for wider social conversations. And I think we do that reasonably well, but I think we can do it better. And I think we're going to be needed more and more, as city centres start to die, as Brexit keeps us divided cause it's not going to go away, you know, all these things, I think actually there's an exploration to be done of that, what museums and galleries can do to stay at the forefront of that power dynamic that you talked about at the beginning.

However, **MS** were also aware that they had a responsibility to reflect and affect societal changes that requires them to continually adapt to the people and society they served in new and novel ways. These adaptations were recognised to necessitate the collection of different kinds of data more able to represent audience engagement, sentiment, and needs. However, **MS** also expressed resignation at being unable to access this data as many of their available resources are committed to adapting to funder required or legislative changes.

One major example was the introduction of **GDPR** in 2018 that forced arts organisations to overhaul their practices regarding personal data:

Matt: Nearly every arts organisation I know of was operating on a consent based model for marketing for as long as I've been in the sector, with the odd exception, but (...) actually the arts were really, really good, in actually leading the way in terms of responsible collection and use of data. (...) I found it really interesting with the introduction, the change, a significant change to the data protection legislation, that there is a proportion of the sector that have gone out of their way to say actually, we're going to start looking at how we can circumvent that, and I know a number of organisations who have, or are strongly considering using, and this is where you guys will pipe up and say 'oh, we've done that', legitimate interest as a means to market.

Chris: For us it was, and you know, the legitimate interest spoke to us cause it was like, if we do this, we could see significant drops in our visitor numbers, and we rationalised that in our audit and in our policies and procedures, but [exhales], yeah, I don't know, I mean it is incredibly difficult to capture useful information in an organisation that doesn't stop everybody at the door and ask for their data, and it is, and so you start to have to be a little bit creative about how you use the data that you do have, which is, you know, challenging.

Frustration was expressed by **MS** at tensions between the changes they wanted to implement, for example in diversifying content and extending outreach programmes, and the perceived barriers of having to keep up with changes forced upon them. **MS** noted that in response to this frustration some museums have resorted to trying to 'circumvent' such regulations by leaning on loopholes or ambiguous areas. For instance, Chris discussed using 'legitimate interest' to maintain newsletter lists after **GDPR** was introduced, to the discomfort of David who expressed moral objections to its use. This fracturing of attitudes to data collection within the industry could be seen to represent the pressure that some

museums feel in trying to maintain their position with limited resources and increasing demands.

5.3.5 Potential Futures for Museums

Reflecting on and shaping potential futures was important to the **MS** in the workshop, and much discussion was leant to what ideal future technologies might enable them to do. For the **MS**, desirable data was deeply qualitative and experiential. For example, **MS** noted a desire for more data surrounding income streams and the psychology of gifting/donating. They also expressed an interest in collecting data around perception of self; impact of visiting arts institutions on identity; personal feelings; and attitudes to art, the arts, and arts venues. There was also a keen interest in understanding both onsite and offsite behaviour of visitors such as motivation for visiting, identities outside the museum, how art affects daily life, and use of different spaces.

For all of the missing data types identified there was a common theme, which was to be able to better identify and understand audiences in order to benefit the museum. For example, who is and is not attending the museums and why, what the role of the museum is beyond the physical venue and what counts as engaging with arts and culture for different people:

Matt: No, no, stop there. You see, to me, yes we want to know who comes to what, but actually I'm always more interested in the people that aren't seeing what's happening, it's the most difficult bit of data to capture, and I'm constantly saying like, this is the period where we're going to do a whole load of focus groups and really identify those people that aren't engaged and use that to refine our offer etcetera, etcetera, it always gets bumped down the list [laughs]

However, there was also an understanding amongst the **MS** that the type of data collection that would need to be deployed to gain this qualitative, experiential data is beyond the scope of both their capacity to collect the data, but more importantly, to be able to understand and utilise it:

Matt: For us there is also the cost of looking at, we would have to have, in order to develop a report which is easily analysable we would have had to

employ a programmer, a statistician who would have been able to develop a sort of, a bespoke interface between the data to then visualise that

David: Yeah you need to look at the return on cost don't you

Matt: Which was going to cost us quite a lot of money, plus on cost because it needs maintaining and updating, so we just, in the end I just decided it, it was an interesting exercise, but it was more interesting than it was useful

Chris: I just wonder, the big thing for me, I know we'll get to more conversations I suppose, is like... The desire to collect more data means that you have to have more capacity inside the organisation to work on that data and make it useful

The practicalities of collecting missing data were a concern to **MS** who expressed frustration and feeling limited in their ability to use data to grow as an organisation. However, even when encouraged to consider what missing data could be valuable *regardless* of the practicalities of collecting it, **MS** still exclusively theorised on data that would be useful to further their existing goals and uses without consideration of improving the experience of the visitor. Improving engagement, meaning-making, and other holistic goals of museum visits identified in 2.3.1 were absent from consideration.

5.4 Discussion

This chapter has presented the findings of a reflexive thematic analysis conducted on data from a workshop with **MS**. The discussion presented here draws together these findings with the findings of **S1** to further contextualise data collection in the museum and speculate on future data-driven practices. Further, the discussion begins to highlight **HCI** (see 1.2) considerations emerging from the data as a vital step towards designing a new process of data collection that considers the current and future needs of the museums as described by **MS**.

5.4.1 The Roles of Data and Technology in the Museum

Personal data and technologies in the museum were discussed at length by **MS** covering a broad spectrum of uses, and an even broader spectrum of attitudes. Many of the data

capturing practices and technologies discussed were controversial even amongst the workshop participants. For instance, **MS** discussed at length how their organisations process data as well as the practices they had observed from other organisations including controversial use of legitimate interest. However, there was also a relatively high level of consistency across museums present in terms of *what* was collected, which in turn was also fairly consistent with the findings of the **S1** content analysis. When asked to identify the types of data collected by museums, **MS** identified 47 data types (Table 4), 40 of which were also seen in **S1**. Of the seven novel data types identified, artistic background and device type can both be understood to be implicitly represented in privacy policies within other data like *interests* or *technical data*, however the remaining five novel types such as wealth screening cannot. **MS** categorised wealth screening to their marketing strategy topic, although this could potentially also be seen as part of the eighth, covert data topic they identified of personal knowledge and uncontrollable data. This data topic was described by **MS** as an important source of personal data for museums, but one that was broadly undocumented in any formal way due to its inclusion of information not typically sought from average museum visitors such as family names, income, and interests. However, all museums admitted to making use of such data as it lent value to the relationships between certain visitors and the organisation, particularly visitors who contributed a lot to the museum both financially and physically and as such were afforded a more personal relationship with the museum. The remaining four novel types were group size, behaviour, decision for attendance, and facial recognition. These data types were assigned by **MS** to the data topics of audience behaviour and events related/engagement and all represent qualitative information about visitors and their onsite behaviour. This type of highly individual data collection came as a surprise as it showed a higher capacity for qualitative data capture than suggested by the literature, the privacy policies, or even **MS** themselves who all expressed frustration at the difficulty of capturing such data.

With the exception of the seven data types detailed above, the data types **MS** identified were broadly consistent with the most common data types in the privacy policies and showed a tendency to prioritise simple, usable data. Data types that **MS** categorised as demographic information represented over a third of the data types they identified. Marketing information and digital/online data accounted for another third, replicating the

findings in **S1** that show that utility of data takes precedence over relationship building or enhancing the visitor experience. This was explained by **MS** as being due to limited resources and expertise that prevented them from engaging with more qualitative data that could be used towards these purposes. However, it was demonstrated in discussions that the collection of this behavioural data was most desirable as an additional resource for internal use and benefits for museum audiences were secondary to this goal.

Despite much discussion of resource limitations, **MS** were keen to discuss the roles that technologies could play in increasing data collection capacity. Facial recognition was a controversial technology amongst **MS** who all began by condemning it as risky for public perception (Macnaghten et al., 2015; Tolmie and Crabtree, 2017). However, as the workshop went on, facial recognition kept being brought up as a novel technology with exciting implications for museums to capture much sought after behavioural data (Carnwath and Brown, 2014). In terms of technologies that had been tried, two of the museums described using Bluetooth and Wi-Fi enabled technologies to track the movement and behaviour of visitors onsite. However, both museums described rejecting the technologies after a short amount of time as they required adaptations to existing infrastructure that would be costly to implement on a long-term basis (Birch et al., 2021). Further, both generated huge amounts of raw data and required training staff in additional skills to monitor the apparatus and answer questions from the public about them. During discussions on the practicalities of the technologies, the **MS** talked about the choice they would have to face if they had maintained the tracking technology between investing in training up a member of staff to be able to process the data and make it usable, or to outsource and send the data to a third party like Google Analytics. Both outsourcing and training staff internally carry financial and ethical burdens with them, particularly relevant in sharing data with third parties without the explicit consent of visitors (Fabian et al., 2017). Outsourcing data analysis is becoming increasingly common as a result of novel technologies being implemented without the internal infrastructure or expertise to maintain them, and having to rely on third parties to step in and provide such services comes with increased data breach risks and decreased trust from visitors (Fabian et al., 2017; Libert, 2018). This is of particular concern when, as established in **S1**, information on who these third parties are, what they will do with it, and why it is shared with them is not easily

accessible (Srinath et al., 2021; Slavin et al., 2016), and when the data collected may be of higher risk to already marginalised peoples (Coleman, 2018; Taylor, 2017; Hoffmann, 2020).

Despite extensive discussion on the potential uses of novel technologies to collect audience data, there was very little discussion from **MS** on the role and opportunities presented by mundane technologies already commonly found in the museum and used by visitors. Social media, for example, is an accessible, almost ubiquitous, and low cost technology that offers access to a vast wealth of behavioural data (Kidd, 2011; Hoffmann, 2020). Its lack of discussion was surprising given the increasing importance of social media to visitors (Weilenmann et al., 2013; Allen and Petterson, 2016; Easson and Leask, 2020) and the numerous references made to it in previous research and interventions (2.4.1- 2.4.2). The literature suggests that social media is commonly used by museums to reach out to audiences, generate additional income, and increase interactivity (Zollo et al., 2021; Museums Association, 2018; Ruggiero et al., 2021). However, social media being almost entirely missing from the discussion contributes to previously highlighted concerns regarding the lack of transparency around third party data access and sharing. The lack of inclusion of social media in discussions of technology, despite all three participating museums having a social media presence, is indicative of the exclusion of ‘mundane’ technologies in speculative thinking about the future, as well as in conceptualisations of the present. This is also supported by the lack of mundane technologies represented in the **S1** privacy policies such as social media and CCTV.

5.4.2 Museums versus the World

Social discourse surrounding museums typically define them as arbiters of culture and knowledge (Duncan, 2002; Murphy, 2019; Dodd and Sandell, 2001; Simon, 2010; Bardzell, 2010). **NPOs** in general benefit from higher levels of trust than for-profit organisations and are more likely to be assumed to be ‘good’ within the *moral order* (Skatova et al., 2014; Tolmie and Crabtree, 2017; Tene and Polonetsky, 2011; Bekkers and Wiepking, 2011). The definition of good is produced by society and its subjectivities (Foucault, 1997; Kelemen and Rumens, 2008). Within the same social discourse, altruistic motivations are highly valued and often act as a catalyst in deciding whether to donate resources to an individual or organisation (Skatova et al., 2014; Bekkers and Wiepking, 2011) and higher levels of trust increase the amount donated (Dwyer et al., 2007). As museums sit within this discourse of

'good', this baseline of heightened trust presents both opportunities and risks to museums as it offers more freedom to adapt novel processes, but also gives them more to lose if such trust is lost. **MS** demonstrated belief in this definition, viewing their organisations as important, meaningful, impactful, and ethically 'good'. This was made particularly explicit in the examination of how they conceptualised and justified their actions regarding the use of personal data onsite. However, **MS** also discussed a number of barriers that prevented them from utilising this trust to create more meaningful relationship with audiences. For example, **MS** often discussed the collection and use of personal data in terms of data they were *forced* to collect and data they *wanted* to collect but could not. In these discussions, **MS** were verbose about perceived barriers and restrictions, conceptualising external forces such as funding bodies and regulators as the locum of these barriers. Typically, these stakeholders were discussed as having power *over* the museums because they made disproportionate demands on museum resources in exchange for financial support (Caldwell, 2002; Shone, 2017). **MS** often discussed these stakeholders as a burden on the already limited time and resources they had, which was compounded by the limited returns the museums felt they received in exchange for their compliance. Specifically, **MS** noted that often the data collection and analysis required by funders is limited in its utility to the museums as they focus on reiterating data the museum already has, or providing data too generic to be of use. Adding even more complexity, the data that different funders may request varies, making the exchange of knowledge between museums and funders limited in its practical uses to the museum. The capacity of funders to demand such high cost resources in exchange for such limited outputs is a mirrored reflection of the same relationship between museums and their visitors. The visitors are, after all, asked to give their time and data up for little to no discernible benefit to them, much as the museums are asked to collect it with limited returns. The power imbalance demonstrated here is endemic to **NPOs** and for-profit organisations alike and so it is vital that any tool aiming to rebalance the exchange of power for the benefit of visitors must not forget the limitations of the museum and their unmet needs.

GDPR was another commonly discussed barrier for the wide-scale disruption it has caused to arts organisations (Shone, 2017; Amos et al., 2021). **MS** discussed **GDPR** at length in terms of both how their organisations had implemented it, and how they had seen other

arts and culture institutions implement it. The conversation highlighted the diversity of ways that **GDPR** was deployed by individual institutions based on their own interpretations and priorities. It also highlighted some of the difficulties that **NPOs** faced in implementing **GDPR** whilst trying to protect their own interests. For some organisations, **GDPR** offered a set of moral rules that aimed to empower audiences in the use of their data, and for others it offered a set of legal obligations that disempowered the organisation (Shone, 2017). Such disparities were even present within the museums in attendance with one organisation choosing to use 'legitimate interest' to maintain their contact list and the two others opting not to. The organisation that implemented legitimate interest to maintain contact with their audiences described a high probability of losing a large proportion of their audience contacts to new **GDPR** rules, whereas one of the organisations that opted not to use legitimate interest were part of a consortium and so were much less at risk of losing large numbers. The ambiguous wording and poor regulation of **GDPR** (Reuter, 2018) further complicated matters, demonstrated in the workshops by miscategorisation of some special category data (sexual orientation and ethnicity) as demographic data. This highlights the complexity of personal data collection in an important way – how can an average, non-expert member of the public come to understand (and make use of) their own rights as data subjects, when such confusion is present at all levels of data-related practices?

Audiences themselves were poorly represented within the workshop. Discussion directly relating to audiences generally either talked about their legal rights as data subjects, or about the risks relating to audience numbers declining. Overwhelmingly, audiences were conceptualised as a resource that could be used in much the same way as personal data to further the funding and impact roles of the museums. The lack of discussion surrounding audience power is endemic of cultural attitudes to customers, but one that comes to the detriment of the museums' stated aim to build more meaningful and long-term relationships. As established by (Passebois and Aurier, 2004), long-term loyalty can be understood as being built through a series of logical chains: perceived quality -> perceived value -> cumulative satisfaction -> trust -> commitment. Empowering visitors to better understand and engage with museums and their content has further been established to contribute to all of these facets (Jones, 2015; Scott et al., 2014; Eklund, 2020). Yet discussion of how audiences can be empowered to facilitate their own visits (Simon, 2010; Falk and

Dierking, 2016) and thus improve museum relations, was absent from the discussion around audience power. Instead, **MS** favoured discussing how audiences could further empower the museum. Reframing the discourse surrounding audience power subsequently becomes a vital part of enabling the cultural shift towards New Museology principles in which visitors are seen as active participants (Simon, 2010) and valued stakeholders.

5.4.3 Speculative Futures of Museums

Whilst fear of negative reception or lack of understanding of technology was a challenge for the **MS**, most of the barriers to meaningful change demonstrated in the workshop were explained as stemming from the limited time and resources the museums have access to (Birch et al., 2021; Selwood, 2002). This is further compounded by the tensions raised between innovations museums *want* to implement, and changes that they are *forced* to implement. **GDPR** was the most commonly referenced source of upheaval that asked museums to re-evaluate their data collection practices; however, there are many more, small-scale legislative or funder changes that museums must consistently work to stay on top of. Responding to legislative changes, including those regarding technology and data collection, is vital to the survival of the museums (Duncan, 2002; Simon, 2010; Eklund, 2020; Murphy, 2019; Darzentas et al., 2022). Despite this, museums often find themselves in a vicious cycle where data is difficult to capture, meaning museums are restricted in their access, resulting in data rarely being used to elicit change, meaning data remains difficult to capture, which limits the capacity of museums to respond to change. However, change is necessary for the social survival of a museum as much as it is for their financial and legal survival. As such, it emerges as an important consideration that any attempt to elicit change must be easy to integrate into existing practices, and must empower audiences and museums alike to identify and enact important adaptations without creating additional burden or disruption.

Beyond necessary internal change, responding to the social changes of the communities they serve and the broader world they represent is also vital to museums (Passebois and Aurier, 2004; Vermeeren and Calvi, 2019; Recupero et al., 2019; Howes, 2015; Eklund, 2020). Accommodating and adapting to contemporary social changes including increased leisure alternatives, improved capacity to access cultural content through the internet, and a growing desire for interactive edutainment (Vermeeren and Calvi, 2019; Falk and

Needham, 2011; Petrelli et al., 2016; Caldwell, 2002; Oakley, 2009; Allen and Petterson, 2016; Easson and Leask, 2020) requires a shift in resources to focus on growing internal capacity for innovation, although current attitudes differ on how this might be achieved. Two of the three galleries represented in the workshop, for example, do not use, nor intend to use, personal data collected to impact their curated content. Rather, when asked how visitor data is currently used, almost all usage was for the benefit of the organisation (i.e. profiling, targeting, reporting, and funding) with limited data being fed back to the visitors through programme development and outreach, and none reported for internal change or development. This resistance to using personal data for internal change cannot be explained by lack of resources, nor by required prioritisation of funder and legal obligations. It is also a potentially concerning resistance, given that **MS** expressed a deep desire to understand their audiences better (Barron and Leask, 2017; McIntyre, 2010; Kovach, 2014; Komarac et al., 2019; Passebois and Aurier, 2004) raising questions around how this behavioural data will be valued and used if it is not overtly for the benefit of the audience.

Building into design considerations the desires of the museum to capture more meaningful, behavioural data must therefore be done in a way conscious of the risks that come with data collection including exploitation, data violence, and further excluding marginalised communities (Hoffmann, 2020; Eklund, 2020; Crabtree et al., 2016; Taylor, 2017). Indeed, **MS** expressed that they primarily wanted data to improve attendance and ultimately attract more revenue sources, however, growth through personal data contains potential to go even further to improve not only the prospects of the museums, but also of the audiences themselves (Nissen et al., 2019; Darzentas et al., 2022; Spence et al., 2021; Ryding et al., 2021). For instance, the health and wellbeing benefits of the museum are well established in the literature as wide-reaching and impactful (Dodd and Sandell, 2001; Prentice et al., 1998; Bardzell, 2010; Mendoza, 2017), although the literature also shows that these impacts are not always reaching certain marginalised or minoritised communities (Eklund, 2020; Hoffmann, 2020; Lynch, 2013). Personal data can offer opportunities to close these gaps by not just identifying these groups, but also identifying what prevents them from engaging *and* starting to break down those barriers. Even more, personal data can be used to personalise the content of museums and the ways that people can interact with it, encouraging meaning-making and learning that is capable of transcending the physical

borders of the museum (English, 2010; Dodd and Sandell, 2001; Ciolfi and McLoughlin, 2017; Ardissono et al., 2012). In terms of the **MS** workshops, the awareness of these possibilities was limited by the more immediate concerns of **MS**, however, there was recognition of the importance of the museum to communities in the ways that **MS** conceptualised their organisations. As such, fostering more meaningful data exchange can be seen as a way to reconnect **MS** to their organisational goals beyond those vital to their survival by incorporating the visitor needs into their data practices that is still mindful of changing discourses surrounding personal data misuse and obfuscation (Tolmie and Crabtree, 2017; Hoffmann, 2020; Taylor, 2017).

5.4.4 Overcoming Limitations

While the sample size for this study was small with just four representatives present, participating museums were carefully chosen to cover a breadth of different priorities, styles, and content in order to ensure a variety of perspectives were covered. The small number of participants also allowed for much more in-depth discussion to be facilitated within the constraints of the workshop in order to access deeper levels of insight into the matters discussed. This is done without overgeneralising the findings, but rather using them to highlight potential barriers and opportunities within the sector.

One further challenge of this study comes from utilising reflexive thematic analysis to analyse the data. Reflexive thematic analysis is an extremely powerful method of analysis when looking to draw out explicit and implicit data on a phenomena. However, it is common for practitioners to have their themes, codes, and nodes validated with another researcher who also conducts a reflexive thematic analysis on the dataset for comparison. Despite this, through a combination of reflexivity (detailed in 5.2.3) and rigorous iteration of themes, reflexive thematic analysis is a viable method to use without a second analyst. Given the nature of the PhD process, I was the sole analyst of this dataset, albeit with some vital input from my supervision team.

5.5 Contributions to Conceptual Framework and Summary

This study exposed the findings of a workshop conducted with **UK** museum staff to reflexive thematic analysis to explore how personal data is collected and used, and what valuable data is not currently collected and why. The study highlights several of the challenges faced

by museums in terms of resource allocation and prioritisation, as well as future opportunities for data-driven change. These findings are summarised here, and contributions to the evolving conceptual framework for the thesis are identified in Figure 7.

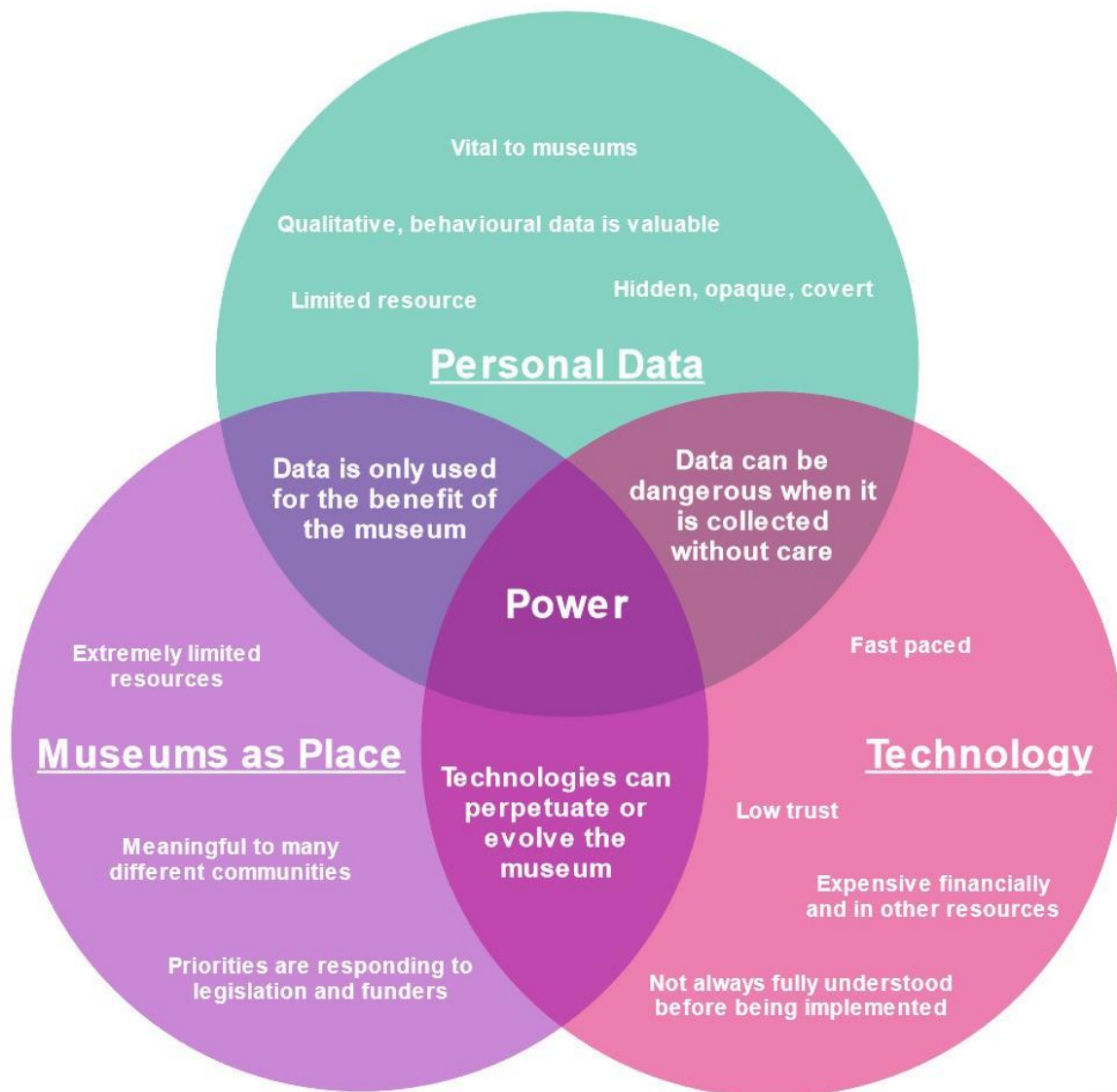


Figure 7. Venn Diagram of Conceptual Framework Contributions from Study Two

In current practice, museums are struggling to collect, analyse, and put into use meaningful data that could impact their own goals or visitor experiences. Technological progress is a source of excitement for **MS** for the possibilities it opens up for meaningful exchanges, but current capability to take advantage of those technologies is limited. Further, **MS** demonstrated that they are struggling to keep up with technological trends as a result of

limited resources and rapid technological progress, implementing systems and technologies that quickly become outdated and a financial burden, which in turn reduces the likelihood of future innovation. These limitations were increasingly pushing museums to turn to third parties to analyse and report on the data collected, a practice that **MS** observed to be risky for visitor data and the museums' reputations. Limited resources were a common complaint from museums not just for their restrictions on implementing technologies, but also in terms of having to prioritise legal or funder required changes over those that the museum would more readily benefit from. **GDPR** was frequently discussed as a prime example of the re-prioritisation of limited resources, but also as an example of the complexity of data collection, with different museums implementing different interpretations of the regulations. The ill-defined and complex nature of such changes are shown to add even more obfuscation to data collection for the organisations, making it near impossible for non-expert members of the public to engage with the topic themselves.

Other barriers discussed by **MS** included challenges in accessing usable audience data. **MS** highlighted that the kinds of data they would like to collect that would provide the most direct value to the organisation is qualitative, behavioural data. However, the collection of such data was increasingly shown to be done through third party analytics, with such outsourcing not disclosed to audiences. This outsourcing comes in direct response to the limited ways museums have to collect and analyse complex data as a culmination of all of the barriers detailed here, ultimately definable as the practical and economic costs of investing more in qualitative data collection. These outsourcing practices already in place were not represented in the content analysis conducted in **S1**, suggesting that the data sought by museums is not currently formally collected and so not subject to the same protections and regulations as other visitor data. However, an important consideration that emerged is that should this valuable, qualitative personal data become available to museums, it must not be collected in exploitative ways or in ways that could be detrimental to the visitor whose data is providing such value. Rather, the findings indicate that mutually beneficial data exchange that re-empowers visitor *and* museums should be sought as the gold standard of data collection.

The study concludes that the current practices of data collection within museums are deeply influenced by – and influential of – power dynamics between different groups of relevant

stakeholders. Funders were described as wielding the most power, able to dictate what data should be collected, how, when, and what is done with it. This was experienced by **MS** as a burden on resources with minimal reciprocation or benefit to the organisation. In turn, **MS** described harvesting data from their visitors with little notification or explanation and minimising the collection of data most relevant and useful to the organisation. This reflects in the privacy policies explored in **S1** and risks alienating and damaging the trust afforded by visitors, as well as being increasingly unsustainable with the shift to New Museology. However, this explanation also fails to account for the agency that museums do have in choosing how to serve their communities, and the findings also showcase that such barriers are at least in part a choice of museums to prioritise their own growth. Audience power was minimally acknowledged by **MS**, and underestimated in terms of the affordances visitors can contribute to the museum experience. As such, this project turns to the concept of co-creation to continue building the requisite knowledge to make meaningful change in museums that enhances the ability of the museum to use personal data to keep up with social change, whilst also protecting and empowering the visitor.

6.0 Contextualising Museum Visits with Audiences: Study Three

6.1 Introduction and Background

This chapter presents the results of research engagement with museum audiences (**MA**). This study aims to explore the knowledge, opinions, and priorities of **MA** regarding their personal data in **museums**, building on the findings of studies one (**S1**) (**4.0**) and two (**S2**) (**5.0**) to further a holistic overview of personal data in museums. **S1** and **S2** used museum privacy policies and a workshop with museum staff to explore the current state of data collection in museums from the perspective of the organisations themselves. The studies found that museums currently collect a broad range of personal data and that it is increasingly common for them to turn to third parties for analytics. It showed that museums have a desire to collect more qualitative, behavioural data on their **visitors** but lack the resources to collect and analyse it. It further showed that funders are seen to wield the most power of any **stakeholders**, followed by the museums, and that **audiences** were considered to have little power to affect the museums, museum data collection practices, or their own museum experiences.

In order to continue to explore the current status and potential futures of personal data in museums, audiences were recruited to take part in workshops to contribute their perspectives, needs, and visions of the future. Specifically, this study tackles the thesis questions by exploring public perceptions of personal data, the value of different personal data to data subjects, and how that value can be acknowledged (Figure 8). Presenting a lens of ‘power’ to participants, **MA** were encouraged to consider how power might be hidden or overt in their interactions with museums and personal data. Four activities were undertaken that encouraged exploration of existing knowledge, data that could be of value to museums, and the personal value of **MA** data. Due to the impacts of COVID-19, workshops were conducted at first in-person, and then later online. The justification and impact of this change is detailed in 6.2. A content analysis of responses contributes to the corpus of contextualising data collected for this thesis. These findings go on to define and shape the application developed for the fourth and final study.

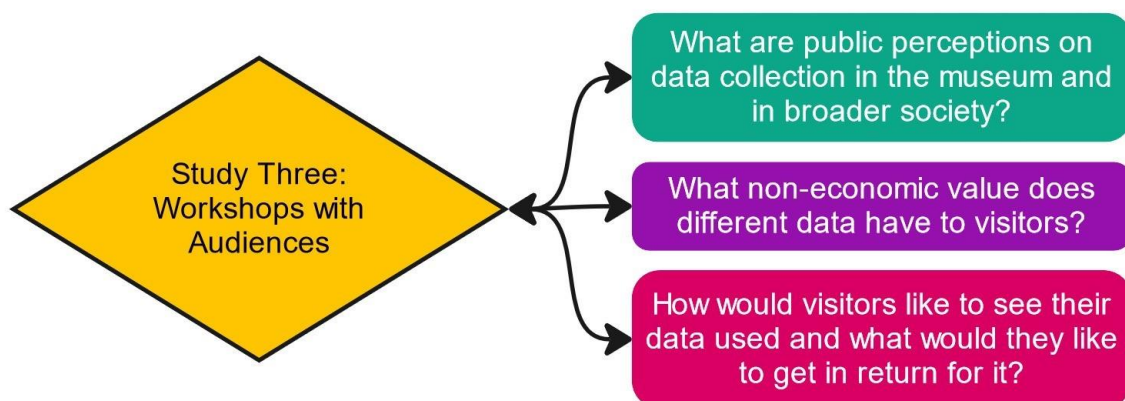


Figure 8. Sub-questions Addressed in Study Three

In **S2**, museum staff highlighted a desire for more qualitative, behavioural data to be collected about their current and potential audiences. This was prevalent in both the types of data they were already *trying* to collect, as well as the data they *wanted* to collect. Qualitative data offers such value to museums because it captures intangible, intrinsic, and personal impact that museums may offer visitors, such as increased creativity, empathy, self-esteem, empowerment and decreased crime rates, unemployment, and isolation (Dodd and Sandell, 2001; Bardzell, 2010; Ruggiero et al., 2021; Mendoza, 2017; Simon, 2010; Ciolfi and McLoughlin, 2012; Ciolfi and McLoughlin, 2017). Having access to such data not only provides a valuable asset to the museum for internal use, but also offers different metrics that better demonstrate value to funders and government (Caldwell, 2002; O'Neill, 2019; Murphy, 2019). While quantitative data is competent at measuring visitor numbers, average spend, and demographic information of visitors, the value of such data can merely show the current 'success' (or failure) of a museum without providing insight into why, what needs changing, and the holistic benefits of museums on communities and individuals.

In order to meet these museum goals, however, it is vital to be cognisant of the challenges and risks to increased data collection - particularly more personal and identifiable data – and how these might be experienced by and affect different visitors. The challenges and risks of data collection are many, not least of which are the risks mismanaged personal data poses to audiences, particularly marginalised or minoritised audiences (Hoffmann, 2020; Taylor, 2017; D'Ignazio and Klein, 2020). Many of these risks and challenges are highlighted

and explored in previous sections of the thesis, but here I wish to highlight one specific aspect of risk and challenge that can be uniquely tackled by museums. As such, I specifically draw attention to the challenge of furthering the museums' ability to *educate* citizens on important and contemporary topics (Dodd and Sandell, 2001; Bardzell, 2010; Simon, 2010), including surrounding their own data. Empowering members of the public to engage with their personal data, to understand what data collection means for them and others, and to know (and make use of) their rights as data subjects is a vast task, however one which can benefit all stakeholders involved in the museum experience. Current discourse around personal data collection and exploitation labels it as mundane and everyday (Vitale et al., 2020). The subjectivities that shape the social discourse paint a picture of inevitability that prevents people from investing in action (Taylor, 2017; Hoffmann, 2020). This is particularly significant as boundaries between volunteered and harvested data are blurring and it becomes more challenging to know (or affect) who is collecting data, why, and what is done with it (Taylor, 2017; Tolmie and Crabtree, 2017). This shift to dataveillance as part of the moral order (Taylor, 2017; Tolmie and Crabtree, 2017) enhances feelings of powerlessness and inevitability and has been deeply exacerbated by the normalisation of social media sites whose main revenue streams come from selling harvested data to advertisers (Tolmie and Crabtree, 2017). Awareness of exploitation by companies like social media giants or Google does not extend to awareness of ability and rights to combat exploitation, but rather veils them within the moral order.

Misinformation and misunderstandings of how personal data is collected and used within current discourse is notably detrimental to the individual *and* to broader society (Hoffmann, 2020; Taylor, 2017; Lupi, 2017). Personal data can be immensely powerful, but when context and transparency is missing, people often do not understand how their data can be used detrimentally (Chamberlain et al., 2017). Be it sharing menstruation data with an app that passes inferred data onto insurance companies, pharmaceutical organisations, and advertisers (Gilman, 2021); outing gay people before they are ready (D'Ignazio and Klein, 2020); or redlining entire communities and enforcing segregation by algorithm (D'Ignazio and Klein, 2020), such power is hidden from the average person. This misuse directly contradicts the altruistic motivations many individuals report as the key motivation of sharing their data (Skatova et al., 2014; Dowthwaite et al., 2021), and such breaches, when

revealed, deal great damage to any trust built between organisation and individual. Where lack of trust may have limited impact on monopolies like Google, Facebook, or Twitter; it does have a much larger impact on organisations whom people can more easily opt not to engage with.

As such, in order to explore how museums could access personal, behavioural data, it becomes vital to open communication with the people *providing* that data, to foster transparency, build trust, prevent misuse, and forge long-lasting and meaningful relationships. Doing so whilst being cognisant of the post-structural feminist lens of power that runs through this thesis centres the power disparity between museums and audiences. In order to fully embrace the New Museological principles of empowerment, agency, and interactivity then, we must address this power imbalance directly, by involving the audiences themselves in co-creative practices that allow them to explore and answer questions around the value and use of their personal data in knowledgeable and informed ways.

6.2 Designing the Study

This section details the design process for study three; the museums involved, **MA** recruitment, the workshop both in its initial form and then the online alternative, and analysis. The workshops were approved by the University of Nottingham's School of Computer Science Research Ethics Committee in September 2019 and the updated online alternative was approved in May 2020.

The design of study three was directly influenced by the findings of the previous studies that provided the necessary knowledge to ask audiences for their perspectives on information grounded in the reality of data collection within museums. Using post-structural feminism to uncover both the deliberate actions of museums as well as the hidden and missing practices provides the fundamental knowledge necessary to design the activities. For instance, knowing what qualitative data museums desire (but cannot currently access) provides the baseline for asking **MA** to consider what that data is worth and how it could be collected and used by museums. Further, **S1** and **S2** exposed the limitations museums face that prevent them from collecting certain data, leading to an activity that asks **MA** to speculate on how their data could be collected in novel ways that also meet their own social and

moral expectations. Finally, understanding the power museums wield, as well as how they perceive the power of audiences to exist (or not, as was the case) highlights a lack of insight into audiences. Responding to this gap, the study also explores how audiences navigate the museum; how they make meaning, what power structures they experience, the impact of those structures, and how they perpetuate or resist those powers. This study integrates this knowledge and the questions it raises into the design of the **MA** workshops in order to explore how museums can re-empower audiences as data subjects, whilst also benefiting from the process, all with minimal disruption to infrastructure and resources.

6.2.1 Recruiting Museums and Audiences

The original design of the **MA** workshops involved facilitating sessions at museums local to Nottingham. As with the museum staff workshop in **S2**, it was deemed to be important to host the workshops in museums for contextualisation purposes and to foster the creation of a mutual, creative *place* for audiences to attend (Ørngreen and Levinsen, 2017). It was also anticipated that by using different museums, the workshops would attract a broader range of audiences with different background, priorities, and motivations. I approached three museums to provide the physical location of the workshops, all of whom I had become familiar with throughout the PhD process and who provided distinct kinds of content and outreach to different target audiences:

- Museum one is a contemporary art gallery that showcases international contemporary art and maintains strong connections with various universities and schools for educational outreach and research.
- Museum two presents itself as a creative space that focuses on culturally diverse contemporary arts and engagement with a range of communities.
- Museum three is a university based art gallery and museum that showcase a broad range of visual and performing arts and pride themselves on platforming innovative and experimental artists.

Workshops were to be limited to 10 **MA** per session (for a total of 30 participants) to guarantee that I could facilitate appropriately and ensure that all participants had an equal platform (Jewitt et al., 2020) whilst consciously de-platforming myself as the 'expert' to mitigate power imbalance (Kesby, 2005). Recruitment for the in-person workshops was

conducted through posters and flyers shared in each of the three museum sites, at a number of other independent organisations around Nottingham, online via Twitter, Facebook, and Instagram, and through museum e-newsletters. Workshop times and dates were established with venues prior to recruitment, and the advertisement literature asked interested audiences to email me with their preference of workshop. Once potential participants made contact, I responded to them with further information about the research, including the information sheet and privacy policy (Appendix Three). Workshops were semi-structured, facilitated discussions lasting 1.5 hours, centred on four organised activities completed with pen and paper. The requirements for taking part in the study were being over the age of 18 and having visited a museum or gallery within the prior 24 months.

Unfortunately, the second and third workshops were cancelled due to COVID-19.

Alternatives were carefully discussed between myself and my supervision team, and an online alternative was conceptualised that would digitise the original activities. The process of conversion necessitated considering how to achieve knowledge sharing, discourse, and debate between participants. One of the key benefits of workshops comes from being able to facilitate dialogue between participants, following up on topics that emerge in discussion and capturing broad ranges of topics that occur in conversation (Ørngreen and Levinsen, 2017; Kesby, 2005). Mimicking the workshops online through the use of software such as Microsoft Teams or Zoom was one option considered, but was ultimately rejected for a number of reasons. As lockdown was a new phenomenon, it naturally brought with it broad reaching changes to daily life, some of which took longer to respond to than others. For example, arranging childcare, other caring responsibilities, balancing physical and mental health, and adapting to working at home all required physical and mental resources to be expended at a rapid rate. I felt that asking participants to attend a workshop online at a fixed date and time was inconsiderate during such a period of upheaval. Further, at the start of lockdown, communication technologies such as those listed above were not as commonly used and were much more restricted in terms of functionality. Instead, the workshops were changed to be completed through a flexible, collaborative, online workspace that could be freely and easily accessed by participants around their existing commitments and needs. This was deemed to be the best option available that could recreate a virtual shared space and place for participants to explore the topics (Ørngreen and Levinsen, 2017).

Ethics were re-submitted and approved, and recruitment recommenced shortly through social media and directly with participants who had signed up for workshops and had agreed to be re-contacted. New and existing participants were also asked to snowball the research to friends and colleagues who may also be interested in taking part.

6.2.2 Designing the Activities

Four activities were designed that drew from existing literature cannon and from the findings of **S1** and **S2** to prompt **MA** to consider their current knowledge and attitudes towards personal data and potential futures. This section details each activity and, where needed, offers an explanation of how it was digitised for the online alternative.

6.2.2.1 Activity One

The first activity provided **MA** with a worksheet to complete that asked them to consider their motivations to visit museums, activities completed onsite, takeaways, and the impact of arts and culture in their daily lives. An example of a completed worksheet can be seen in (Figure 9). The questions asked in this worksheet represented some of the qualitative behavioural data identified by museum staff in **S2** as missing but important. It aimed to encourage **MA** to consider their own relationships with museums more conscientiously, as well as providing prompts for future activities and tangible examples of qualitative data that might be of use to the museums. Completed worksheets also provided valuable, novel data that offers insight into the priorities and needs of audiences.

Why do you come to art galleries?

Socialise and discuss the ideas/topics/perspectives shown through the variety of art.

To gain a better understanding of different art forms.

Support local artists and exhibitions.

JOT DOWN A COUPLE OF BULLET POINTS FOR EACH QUESTION, AND FEEL FREE TO PERSONALISE YOUR CHARACTER*!

What do you do while you're there?

View / interact (if I'm allowed) with the art/exhibition. Discuss with friends our interpretation / meaning of the art.

Age, gender, and occupation:

27, female, unemployed.

How often do you visit art galleries or museums?

once a month.

What do you take away with you?

Sometimes it can be a new view or perspective. A new appreciation for an art form. Or a swanky souvenir.

What makes you go back?

New exhibitions.

How does art/culture affect you on a day-to-day level?

As I don't spend a lot of time in galleries. I would say non-traditional is more prevalent in my life. Interactive art or digital art. These affect my wallet and/or deliver an experience.

How does art/culture affect the way you see the world?

It allows me to see people/places/problems in the world that I was unaware of, in an informed or unique way.



*If you would like to, I've left some accessories off to the right hand side, you can drag and drop them onto your silhouette or use the draw tool which looks like a pencil on the left hand toolbar

Figure 9. Miriam's Silhouette Activity Sheet

6.2.2.2 Activity Two

Activity two encouraged **MA** to hypothesise and identify what data is already collected about them by museums. The aim of activity two was to establish a baseline of existing knowledge that audiences hold around existing data collection practices. Existing literature suggests that members of the public have a reasonable level of knowledge about current data collection practices (Tolmie and Crabtree, 2017) and this activity sought to confirm this

whilst provoking discussion and knowledge sharing between participants. Further, the activity would be educational for participants who could learn from each other about data collection practices and take this knowledge forward into the other activities and daily lives.

6.2.2.3 Activity Three

The third activity provided three questions for **MA** to consider and answer about each of the data types identified in the previous activity. The questions sought to establish the value of each data type and whether **MA** believed museums should be able to collect it. For each data type, **MA** were asked whether they would donate that data to the museum, how valuable the data was, and if they would want to be able to access and change the data in the future. Data types were identified from the corpus of activity two and presented back to **MA** with standardised language, excluding data types deemed overly specific such as 'employment status' or 'name'. For the online alternative, data types were iteratively added as more **MA** took part in the study to mimic the process of identifying and discussing in the in-person workshop and to reflect **MA** priorities as they emerged. **MA** were asked to answer questions for a minimum of three data types.

6.2.2.4 Activity Four

The final activity encouraged **MA** to rapidly generate speculative prototypes for how personal data identified and discussed in the previous activities could be collected and used by museums to improve visitor experiences. **MA** were encouraged to take into consideration not just what one piece of data could do, but how different data types could interact as well as the value that they had given each data type. The rapid ideation was separated into three parts; before, during, and after a museum visit. **MA** were asked to quickly write down at least one idea for each part, and encouraged not to conceptualise their ideas too concretely with reassurance that no answers would be considered silly or wrong.

6.2.3 Designing the Online Alternative

The online alternative to in person workshops was set up in three parts. The first created a website that would act as first port of call for potential participants. The website, which is no longer active, was used for recruitment and provided the necessary information to take part in the study including links to the university privacy policy and project information sheet (Appendix Three). The second stage created a YouTube channel that hosted six videos;

two informational videos and four videos to establish the activities¹⁶. The first two videos acted in the same vein as the introductory presentation in the in-person workshops, introducing myself, the PhD project, the definition of power, and the aims of the study. The other four videos introduced an activity each and taught **MA** to navigate and use the workspaces. The final stage required creating collaborative workspaces on the website **Mural**¹⁷. **Mural** allows online collaborative working using sticky notes, images, and drag and drop mechanics to facilitate online communication and project working. All four activities were reimagined and deployed through **Mural** and available to online participants for up to one week after the final **MA** had completed their activities. The first workspace was created individually for each participant and the other three workspaces were communal boards that were visible to and interactive for all **MA** taking part in the study.

6.2.4 Collecting and Analysing the Data

Due to the hybrid nature of the study, the collected data is also hybrid. The in-person workshops were recorded to Dictaphone, saved as .mp3, and transcribed into .docx format. In-person workshops also produced paper responses, with each **MA** filling in a silhouette for activity one and subsequently using a combination of paper and post-it notes for the other activities. This data was transcribed and aggregated into an Excel spreadsheet. The online **Murals** were downloaded as .pdf and responses were aggregated into the same Excel spreadsheet as the in-person responses.

Initially, data was intended to be subject to reflexive thematic analysis. However, following the conversion to the online alternative, reflexive thematic analysis became impractical with the data available as it requires longer-form responses than were possible from the online alternative. Exploring the discourse and interaction between participants was still a vital element to be considered, but without direct interaction reflexive thematic analysis would have provided limited results. As such, I decided to remove the transcribed audio file from the dataset as it biased the findings towards the in-person participants. Instead, activity responses were analysed through a content analysis (Schreier, 2014) and presented below.

¹⁶ <https://youtube.com/playlist?list=PLVLFpXsRI2sm5ObR8IU92Am0IB5Z2IBG0>

¹⁷ <https://mural.co/features>

6.3 Findings

This section details the findings of the content analysis conducted on the data collected during the study. Due to the anonymous nature of collecting the data online, **MA** cannot be identified for the contributions, and so verbatim texts presented from the data cannot be attributed, except for findings from individual worksheets completed in activity one.

6.3.1 The Participants

The first in-person workshop had 10 participants booked. Five cancelled because of concerns around COVID-19 and one additional participant turned up on the day without prior contact totalling six participants. For the online alternatives, 33 people emailed to express an interest in taking part, of which 26 people completed consent forms. Of those 26, 23 participants completed the activities. Including the six **MA** from the face-to-face workshops, there were 29 total **MA** who took part in the study. From this point in the chapter, participant responses will no longer be separated into in-person and online, but will be aggregated into one list.¹⁸

To begin, **MA** were given the option to provide some demographic information about themselves including age, gender, occupation, and number of galleries or exhibitions attended in an average year. A summary of **MA** demographic information provided can be found in Table 6, where each participant has also been assigned a pseudonym that will be used during through the rest of the thesis where data can be attributed. **MA** included 16 men, 11 women, and 2 non-binary/Agender people. The age range was 22-76 and average age was 45.5, with one participant opting not to share her age. Where participants answered how often they attend exhibits in a year with multiple responses (e.g. 3/4 times a

¹⁸ Whilst an argument could be made to keep the data sets separate, I find the case for aggregation stronger. Participants were delivered the same information about personal data and museums regardless of how they participated and at the same point in the activities. Subsequently, there is no difference in knowledge between in-person and online participants, except for knowledge the participant brings with them. A key difference in datasets is that in-person participants were able to work together in real-time to answer group activities, where online participants had no live community support. This disparity was mitigated by the inclusion of answers from in-person participants in the shared online workshop space. To ensure equal weighting of the findings from in-person and online workshops, the transcript from the in-person workshop has been removed from the dataset, instead focussing exclusively on responses to activities. This has also been addressed by the switch in analysis method from reflexive thematic analysis to content analysis.

year) the higher number was taken. The average number of exhibits visited each year by MA was 6.3.

Table 6. Museum Audience Demographic Information

Name	Age	Gender	Occupation	#Museums/Exhibits attended
Anora	53	Female	Retired	4
Morrigan	55	Female	Retired	12
Leiliana	27	Female	PhD Student	2
Alistair	69	Male	Retired	12
Sten	28	Male	Event Supervisor	2
Garret	34	Male	Graduate	5
Miriam	27	Female	Unemployed	12
Argent	29	Non-Binary	PhD Student	2
Duncan	56	Male	Retired	9
Isabela	69	Female	Retired	12
Dorian	24	Male	Student	2
Cailan	31	Male	PhD Student	6
Vivienne	-	Female	Manager	6
Leandra	60	Female	Carer	6
Briala	54	Female	PhD Student	6
Malcolm	76	Male	Architect	5
Fiona	53	Female	Journalist	6
Donnic	39	Male	Project Manager	2
Nathaniel	63	Male	Self Employed	5
Dagna	30	Female	Unemployed	1
Greagoir	66	Male	Retired	2
Lace	27	Female	Project Manager	5
Felix	27	Agender/Non-Binary	Data Analyst	5
Connor	27	Male	Unemployed	1

Bethany	69	Female	Retired	4
Merrill	68	Female	Retired	12
Cassandra	64	Female	Charity Worker	3
Sera	22	Female	Student	6
Wynne	28	Female	Undisclosed	6

6.3.2 Activity One – Silhouette Activity

Activity one asked **MA** to complete a silhouette activity worksheet, an example of which can be seen in Figure 9 as filled in by Miriam. The worksheet was designed to capture qualitative, behavioural data deemed valuable by museum staff in **S2**, and to provide participants with prompts to reflect on for the remainder of the activities. **MA** responses to each question on the worksheet were standardised as part of the content analysis and are presented below in Table 7, Table 8, and Table 9, where the title of the table mirrors the prompt given to the **MA**. Tables are grouped into pairs and are further explicated beneath each pair.

Table 7. Responses to Silhouette Activity Questions One and Two

Q1. Why do you come to art galleries/museums?		Q2. What do you do while you are there?	
To see exhibitions	17	Look at the exhibits	23
For educational/learning purposes	15	Explore or wander the space	9
For an experience	8	Learn/Read about the exhibits	9
For provocation/inspiration	7	Go to the cafe	7
To experience culture	6	Socialise	6
To see other perspectives	6	Discuss art with friends/other visitors	3
For fun/novelty	5	Interact with interactive elements	4
To socialise	5	Other activities available	3
To relax	4	Take photos	3
Because of the location	3	Do an audio tour	3
To visit the cafe	3	Daydream/think	3

To support local artists	3
For self-exploration	2
For meetings	1

Visit the gift shop	3
People watch	2
Take notes	1

Table 7 shows that first and foremost, **MA** visit museums to see the contents of an exhibition. However, another visit motivation that was identified by over half of **MA** was for educational/learning purposes. Other key motivations that were slightly less prevalent but still important included inspiration, experiences, other perspectives, fun, and socialising. In comparing motivations and activities, there are a number of parallels that emerge that showcase *how* visitors use museums to meet their expectations. For instance, fun and relaxation were fairly common motivators in the data and were visible in activities such as photography, daydreaming, and people watching. Similarly, engaging with culture and seeing other perspectives emerged as important motivations and can be seen in activities in the forms of discussion, reading, and audio tours. However, not all motivations and activities directly related to the content of the museum. For example, the café was a relatively common motivation and activity, as were ‘other’ events like film showings, charity events, and business meetings, showcasing the social role the museum plays within a community too.

As activity one was completed on an individual basis, it is also possible to highlight direct correlations between activities and motivations for specific visitors. This can show more specific examples of how meaning-making is experienced. For example, **MA** whose primary motivation was seeking inspiration focussed their activities around exploring the exhibitions and reading more around the content (Argent, Leliana, Alistair, Isabela, Vivienne, Briala, Dagna, Greagoir, Lace, Felix, Sera). Exploring was a common activity described by **MA** as a core part of their visit and **MA** frequently used language such as ‘wander’ (Alistair, Garret, Briala) or ‘mooching’ (Dagna) to describe it. **MA** who attended museums to learn about culture (Wynne, Connor, Fiona, Leandra, Duncan, Sten) also explicitly mentioned reading and/or taking audio tours around the museum in their activities and **MA** whose main motivation was socialising (Anora, Garret, Miriam, Cailan, Donnic, Merrill) mentioned discussing the content with others and visiting the café.

Table 8. Responses to Silhouette Activity Questions Three and Four

Q3. What do you take away with you?		Q4. What makes you go back?	
Ideas/Inspiration	12	New exhibits	19
Souvenirs or flyers	9	To take more in (of the same exhibit)	9
Memories	9	Just to go to a gallery/Escapism	5
Knowledge/Insight	9	The venue	4
New/Developed artistic interests	9	Good café options	3
New perspectives	4	Going with different people/as a social event	3
Smiles/Positive feelings	3	Interactive exhibits	3
Peace of mind/Calmness	3	The location	3
Photographs	3	They do not go back	2
A full tummy	2	Specific events	2
Fun	2	Friendly staff	2
Culture	2	Accessibility	2
Shared experiences	1	Free entry/annual pass	2
Topics for discussion	1	Good guided tours	1
New experiences	1	Good shopping	1
		Humour/Wit	1

Table 8 shows how **MA** value museum visits in terms of what they take from a visit and what motivates them to return. **MA** reported a mixture of physical and non-physical takeaways, with inspiration and souvenirs occupying the two most popular responses. Other than souvenirs, the most commonly cited takeaways for **MA** were intangible, for example memories (Garret, Dorian, Greagoir, Merrill, Cassandra, Leiliana, Alistair, Cailan, Fiona), knowledge (Anora, Morrigan, Leiliana, Sten, Duncan, Briala, Donnic, Nathaniel, Sera), expanded artistic interests (Sera, Merrill, Bethany, Felix, Lace, Dagna, Malcolm, Briala, Miriam), new perspectives (Miriam, Duncan, Isabela, Donnic), and peacefulness (Merrill, Dagna, Isabela). However, tangible gains such as photographs were also presented (Duncan, Dorian, Vivienne).

Motivation for returning to the museum was overwhelmingly reported as wanting new content to see, followed by taking more in from a previously attended exhibit. Similarly to takeaways, reasons for revisiting were primarily ephemeral, for example escapism (Argent, Leandra, Briala, Greagoir, Sera), friendliness (Dagna, Anora), the venue itself (Cailan, Dagna, Greagoir, Lace), and different social experiences (Leliana, Dorian, Fiona). However, there were also tangible reasons for re-visiting including the café having good options (Merrill, Leandra, Duncan, Cassandra, Anora) and financial incentives like shopping, free entry, or annual passes (Merrill, Cassandra, Fiona). Two **MA** also made note of accessibility needs influencing their decision to return or not (Felix, Cailan).

There are also parallels between takeaways reported by **MA**, motivations to visit (Q1, Table 7), and motivations to re-visit that show the complexity and variety of museum experiences. For example, Alistair's motivations to visit museums are 'to see (hopefully) interesting art that provokes new ideas' and his takeaways are 'hopefully images that have been enjoyed' and 'ideas for future projects', showing that he looks for new ideas that he can take forward into his own projects in the future. 19 of 29 participants identified new exhibits as a core driver to return to the museum including Alistair, who returns because 'usually different exhibits have different subjects to see' and therefore more chance to generate new ideas. However, not all **MA** expressed motivations that are so clearly defined. Argent's motivations to visit are 'inspiration, aesthetic pleasures, to experience, encounter and feel myself, others and the world' and their main takeaways are 'feelings, ideas, pleasure (also i leave a lot of feelings in the museum)'. For Argent, their motivations are heavily focused on inspiration as well as experiences and emotional connection, rather than for specific creative purposes. This is clearly reflected in their reasons to revisit; 'new exhibitions, experiencing the same art multiple times, the joy of browsing a gallery'. Their use of museums as somewhere to find emotional resonance means that unlike Alistair, they are sometimes drawn to revisit the same exhibitions as well as being drawn to new content. On the other hand, Dagna's motivations to visit are very clearly defined; 'I love art, so I go to galleries for inspiration, new artists, art history, local work, and some peace and quiet'. Again, there is a clear connection between this and her takeaways which are 'hopefully some new artists that I like, and a bit of peace and calmness from the experience'. Rather than for inspiration or ideas, for Dagna, visiting a museum is a holistic experience that is

able to provide a soothing atmosphere and in which the content of the exhibit becomes secondary to the act of attending. Her desire to revisit venues also reflects this priority; ‘new exhibits and also the feel of the building and staff. If the building is interesting I will often go back even if the exhibits don't change often’.

Table 9. Responses to Silhouette Activity Questions Five and Six

Q5. How does art/culture affect you on a day-to-day level?		Q6. How does art/culture affect the way you see the world?	
Influences own artistic practices	9	Improves awareness/understanding of others	15
Improves mood and wellbeing	9	Provides a different lens/perspective	11
Influences entertainment choices	9	Better appreciation of the world	7
Offers new topics of conversation	5	Better understanding of self	5
Improves knowledge about history or culture	5	It's everywhere, so in every way	4
Influences home decor	4	Improves mood or wellbeing	4
Sense of self	4	Highlights connections between different things	2
Escapism	3	Causes questioning of beliefs	1
Affects world view	2		
Offers community	1		
Affects fashion choices	1		
Affects food choices	1		
Financially	1		
It doesn't	1		

The final two questions on the activity one worksheet asked **MA** to consider the impact that the arts and culture sector has on them as individuals, both in their day-to-day lives and their wider understanding of the world. In terms of personal, daily impact, **MA** reported that arts and culture affected a broad array of facets including their own artistic practices (Sten,

Isabela, Cailan, Malcolm, Dagna, Greagoir, Felix, Merrill, Cassandra), their mental health and wellbeing (Sera, Wynne, Merrill, Leandra, Vivienne, Isabela, Dorian, Duncan, Anora), and personal knowledge (Isabela, Dorian, Fiona, Nathaniel, Sera). These highly personal and meaningful impacts that **MA** detailed were also reflected in their reports on how the arts and culture sector affected their worldviews. For example, **MA** overwhelmingly reported that museum visits increased their empathy and understanding of others and improved their ability to understand the world through different lenses. Arts and culture were further linked by **MA** to a broader appreciation of the world (Leliana, Isabela, Leandra, Briala, Dagna, Lace, Connor) and themselves (Wynne, Bethany, Nathaniel, Dagna, Briala). Even the two **MA** who could not identify any ways that art and culture affected them on a personal level both recognised that museums did impact their worldview in other ways such as through understanding of others (Garret) and improved understanding of self (Bethany).

The answers provided by **MA** about the impact of arts and culture on their personal lives and worldviews were broadly cohesive with responses to the other questions, showing a holistic approach to museum visiting in which visitors create meaning and find ways to make museums relevant in distinctive (albeit not unique) ways. For example, Connor visits museums 'to expand my knowledge of a time period or just to appreciate other's creativity'. While there, he engages in reading and explores exhibits carefully for small, hidden details that may reveal more information relevant to his motivation. His desire to carefully explore new ideas and creativity is also visible in his day-to-day engagement with arts and culture:

I have a couple Banksy prints in my room I see everyday when I wake up if we were using art in the sense of a picture or painting but in a broader sense of the word, I listen to music daily ranging from Jazz/Classical/Hiphop which I believe could constitute multiple cultural aspects which are interwoven into my day-to-day life.

Further, engagement with culture in order to learn about other people and times was important to Connor as 'it broadens my awareness knowledge and appreciation of certain times, countries or racial experiences outside of my own'. As demonstrated by Connor, the motives, takeaways, and impacts of museum experiences are complex and far reaching, but also holistically intertwined. Another example comes from Felix whose motivations to

attend museums revolved around learning new things, feeling inspired, and sharing experiences. For Felix, this means comprehensively reading and engaging with the content as much as possible, taking away with them physical leaflets, art related merchandise, and new knowledge about 'particular artists/people mentioned in the exhibit I want to look up further'. By engaging with museums in such a way, Felix is able to find inspiration for their own artistic practices and expand their knowledge about art, music, and other media that they may not have known about before. Further, this 'introduces me to different concepts/ideas that'll make me see everyday things different e.g. a gallery in London discussing how 'play' amongst children and adults has changed over time and with ever shrinking outdoor areas and increased tech in our environment'.

6.3.3 Activity Two – Identifying Data

For the second activity **MA** were asked to contribute to a communal **Mural** workspace to identify what kinds of data they thought museums collected. This activity hoped to capture an idea of the 'expertise' of **MA** in personal data practices and to provide a basis for comparison with perceived versus real data collection and how that might shape or impact trust. Data provided by **MA** was standardised and categorised into an Excel Spreadsheet, and is listed in full below. Where **MA** also provided specific examples of data types, they are presented in parentheses.

MA identified 43 unique data types they believed to be collected by museums:

- (Dis)ability
- Activities attended
- Age
- Artistic preferences
- Bluetooth
- Car registration
- CCTV
- Conversations
- Cultural background
- Details of visit (length of visit, time of arrival, time of departure)
- Dietary requirements

- Distance travelled to attend
- Email address
- Employment status
- Ethnicity
- Feelings/emotional responses
- Frequency of visit
- Gender
- Gift aid
- Group dynamics
- Hobbies
- Home address
- How they heard about it
- Incentives for visiting
- Interests
- Language spoken
- Level of education
- Mobile phone number
- Mobile phone or internet usage onsite
- Most popular exhibit
- Motivation for visiting
- Name
- Notes/photos/sketches made
- Payment details
- Religion
- Satisfaction with museum visit
- Sexuality
- Social media
- Spending habits
- Use of space (proximity to art, length spent in specific areas)
- Visitor numbers
- Website usage data

- Worldview

MA were encouraged to read the sticky notes that other **MA** had left on the **Mural** before adding their own responses to foster community knowledge generation and interaction. However, as more **MA** took part and generated more notes, the less likely it became that participants would read all of the notes before adding their own. This led to some repetition, although the number of data points that were only entered once suggests that **MA** did read at least some of the other contributions. Additionally, it was rare to find two notes in close proximity to one another that noted the same data points, suggesting that participants at least read the notes closest to the one they were filling in. This is also compounded by the comparatively small number of people who suggested the 'standard' data points like contact details or demographic information.

Of the 43 data types identified, several were standard data types that any organisation may collect, for example age, name, contact details, and CCTV. There were also several data types identified which were more specific to cultural organisations, for example motivation for visiting, most popular exhibit, and artistic preferences. The majority of the identified data types were based on behaviour of the **MA**, for example activities attended, details of visit, emotional responses, group dynamics, satisfaction with visit, and use of space. Only one participant made note of 'website usage data' and none offered other technical information commonly collected as standard practice. Only two participants mentioned social media.

6.3.4 Activity Three – Value of Data

Activity three took the data points generated in activity two and asked **MA** three questions about each data point – would they donate that data to a gallery; how valuable is it; and would they want to be able to change their data in the future. Data types were iteratively added to the collaborative worksheet by myself as **MA** completed activity two in order to reflect iterative **MA** input. In order to not overwhelm participants and encourage the most engagement possible, data types presented in activity three were standardised and simplified versions of those identified in activity two and excluded some of the more specific examples such as 'employment status' or 'name'. **MA** were invited to respond to as many of the data types as they wanted to with a minimum of three separate responses requested.

Data types with less engagement were moved to the top of the **Mural** canvas each day in order to encourage as equal a number of results for each as possible. An overview of responses to each question can be seen in Table 10.

Table 10. Museum Audiences Responses to Prompts about their Data

Data type	#Responses	Would you donate	How valuable	Need to change
Material incentive to visit	17	>90% yes	Low	>90% no
Details of visit	14	>90% yes	Low	>90% no
Use of space	19	>90% yes	Low	>90% no
Motivation for visiting	18	>90% yes	Low	>90% no
How you heard about the exhibit	24	>90% yes	Low	>90% no
Frequency of visits	22	>90% yes	Low	Mostly no
Dietary requirements	19	>90% yes	Low	Equal mix
Emotional response	18	>90% yes	Mixed	Mostly no
Demographic data	20	>90% yes	Mixed	Mostly no
Preferences and interests	22	>90% yes	Mixed	Mostly yes
Contact details	19	>90% yes	High	Mostly yes
Hobbies	22	Mostly yes	Low	Mostly no
Who you visited with	23	Equal mix	Mixed	Mostly no
Disability	10	Equal mix	High	Mostly yes
World views	23	Equal mix	High	Mostly yes
Protected information	13	Mostly no	Medium	Mostly no
Cultural background	23	Mostly no	Mixed	>90% no
Bluetooth	16	Mostly no	Mixed	Equal mix
Mobile phone usage	15	>90% no	High	Mostly no
Payment card usage onsite	17	>90% no	High	Mostly no

As shown in Table 10, responses from **MA** to the three questions varied immensely, although they also demonstrated important trends. **MA** were willing to donate all of the

data types that they deemed low value, and some data that some **MA** deemed high value, for example *emotional response*, *demographic data*, *preferences and interests*, and *contact details*. There was limited interest in being able to change responses to low value data, with the exception of *dietary requirements* in which roughly half of **MA** said that they would want to be able to change the data, and roughly half said they would not. One **MA** explained that they believed the onus for keeping this kind of data up to date should fall on the organisation and not on the individual visitor.

In general, **MA** were less willing to donate data they deemed more valuable. However, this rule was only absolute in two scenarios; for *mobile phone usage* and for *payment card usage onsite*; data that is common practice for museums to already collect. The other data types were more muddled with mixed attitudes towards both value and willingness to donate. One of the more contentious data types was *who you visited with*, which showed mixed responses in terms of both whether they would donate it and how valuable it is. Some **MA** specified that they would only donate this data if it was generic or non-identifiable and with permission of the other people in the party. One **MA** elaborated on why they believed *who you visited with* to be low value not just for them, 'but also see limited value to the gallery if it's with friends/relatives... only if alone or in group'.

Two other data types that were primarily defined as high value were *(dis)ability* and *worldview*. Both had an equal mix of responses indicating willingness to donate or not, but also represented half of the four data types that **MA** indicated they may want to be able to change in the future. Desire to change for *(dis)ability* was the only data type in which no **MA** elaborated on their position and simply answered 'yes' or 'no'. Further, highlighting the different responses in willingness to donate *disability* data, two **MA** stated that they would only consider sharing this information if it was required by the gallery and they knew what it would be used for. *(Dis)ability* had the lowest response rate of the data types in activity three, explained succinctly by one **MA** who said 'not relevant not disabled'. For *worldview*, willingness to donate was very mixed, with eight **MA** saying they definitely would donate the data, four said they might depending on the purpose and if they trusted the gallery, and 11 declining to donate it as they 'don't see why they'd need to know'. The value of *worldview* data was deemed to be very high by the vast majority of **MA**, with one participant distinguishing that they thought it was personal rather than valuable and

another saying that their lack of marginalised characteristics makes the value lower to them than to others. Some **MA** expressed that they 'believe the right of changing your answers is very important', especially if analysis of such data was ongoing. Only two definitely did not want to be able to change it.

The majority of **MA** were unwilling to donate *protected information, cultural background, and Bluetooth*. However, in contrast to the value assigned by the introduction of **GDPR**, **MA** only considered *protected information* to have medium value. Both *cultural background* and *Bluetooth* were more controversial with the value assigned them. In explaining why *Bluetooth* received such mixed responses, two **MA** noted that their phones did not have Bluetooth capability, and three said that they would consider donating this data but noted that they would only do it for a specific purpose. One further participant said they 'don't know' if they would or not, as they could see the value for the gallery but had privacy concerns. *Cultural background* also proved contentious, with one **MA** explaining that they found it valuable explicitly because it was so personal. The majority of **MA** had no interest in changing cultural background, although one said that they would like to access it specifically in order to delete the information.

6.3.5 Activity Four – Reciprocation

Activity four encouraged **MA** to rapidly generate speculative ideas of how the personal data identified and discussed in the previous activities could be collected and used by galleries to improve visit experiences. **MA** were encouraged to take into consideration not just what one piece of data could do, but how different data types could interact as well as the value that they had assigned each data type. Idea generation prompts were split into before, during, and after a museum visit, although responses are presented as one comprehensive list. Once again, a collaborative **Mural** canvas was used for this activity in which **MA** could see the responses left by other **MA**. Responses were standardised and are presented below:

- A live, interactive summary of visitor data
- Discount vouchers/special offers
- Notifications about upcoming exhibits
- Provide suggestions of reading to do/things to watch before or after coming
- Generating a personalised route around the gallery

- Provide information about artists or exhibits they might like
- Provision of a way to journal about the museum visit
- Guided tours
- Relevant accessibility information
- Personalised suggestions in the gift shop
- Nothing
- Information on food/drink available in the museum and nearby
- Suggestions of other activities to do e.g. other museums or times of specific activities
- More transparency in institutional priorities and opinions
- Use data collected to impact future curation
- Spread of opinions on the current exhibit
- Create a profile based on likes/interests to tailor information about exhibits
- Provide suggestions of activities to do that might compliment the exhibit
- Provide topical links between exhibits and current news stories
- Activities that are responsive to visitor behaviour
- Something to tell them what they missed

In line with responses to activity one, several of the suggestions made by **MA** aimed to encourage museums to use collected data to empower the **MA** in their seeking of new knowledge. For example, suggested media, further information and guided tours all demonstrate a desire for more in depth, personalised ways of engaging with content that allows for enhanced access to information. Another popular genre of suggestion centred on enhancing the experience of the visit. For instance, generating memories and having ‘new experiences’ were popular motivations detailed in the first activity and are reflected in ideas such as interactive visitor data, journaling, personalised routes, and responsive activities, which demonstrates a desire to engage in novel, technologically driven ways that make visits to museums more meaningful and memorable.

Learning about other people was also a common suggestion, for example through visual data about other visitors, learning more about individual artists, or seeing feedback on the current exhibit. As seen in activity one, learning about other cultures and perspectives was an important facet of museum visiting that **MA** showed a desire to engage with. Several of

the suggestions also focussed around accessibility, whether it was increased accessibility for disabled visitors, neurodivergent visitors, or those who visit with young children etc. For example, by allowing live information about busy times, information about where seating is available, or the walking distance to visit the entire exhibit, **MA** suggested that their visits would be more comfortable and accessible.

Several of the suggestions made by **MA** are already practiced in museums. Notifications about upcoming exhibitions are often available via social media or through the organisations' newsletter. Discount vouchers and special offers are also relatively common, and access to related works is often signposted in gift shops or on leaflets. **MA** showed either a lack of awareness of these possibilities, or a desire to access such conveniences in different ways. Further complicating suggestions made, several of the speculative possibilities were contradictory to one another. For example, where one **MA** might suggest discount vouchers tailored to their frequency of attending – 'more visits, more discount' – other **MA** would dislike this idea – 'vouchers make me think I'm being overcharged the rest of the time'. Where some **MA** expressed an interest in being pointed towards other artists or exhibits they might like based on their engagement, others would find this disrupted their enjoyment – 'I don't want selective tailored invites, I want to see what I don't know as well as what I (think) I do'.

6.4 Discussion

So far, this chapter has presented the findings of a study aiming to understand the perspective of **MA** regarding museums and personal data. This discussion section builds on these findings to draw out important contributions, and to tie the findings in with those from **S1** and **S2**. It also continues to integrate **HCI** considerations and build towards a technological intervention cognisant of the past, current, and future needs of museums and their audiences.

The aim of this study was to explore the motivations, meaning, and priorities of **MA** regarding their museum visits and sharing their personal data. Understanding museum visits is a widely explored area of study (Falk, 2009; Caldwell, 2002; Falk, 1993; O'Neill, 2019) within which are numerous different methods and methodologies available to understand the role of the museum to visitors. However, given the novelty of this thesis' approach to

understanding **MA** relationships with museums, it was considered appropriate to revisit such well-trodden ground to understand these concepts with the presence of data and power foregrounded. While many activities and motivations described by **MA** were in line with the expectations of the literature, there was a much heavier focus within the findings on the intangible benefits of museums such as improved mental health, community, and own artistic practices than anticipated. Further, while **MA** demonstrated relatively low levels of knowledge about personal data collection and usage within museums, they also demonstrated competency at speculating how data could be useful in mutually beneficial ways.

6.4.1 Audience Attitudes to Museums, Technology, and Personal Data

Throughout this study, audiences were encouraged to discuss how they perceived all three elements of the conceptual framework established for the thesis. Audience attitudes regarding *museums as place*, *technology as mediator*, and *relational personal data* were predictably varied and highly contextual to the setting within which each was found. For instance, as established in 2.3.3, average museum visitors are female, over 40 years old, and with a higher than average income level (Falk, 2009; Falk, 1993; O'Neill, 2019). The average demographics of my participants were mostly male (16/29), over 40, and the most common occupation detailed was retired. **MA**, therefore, were atypical in terms of gender representation, but average for age. Occupation is not a strong indicator of income, particularly for those who are retired, however the occupations detailed were extremely varied in terms of typical income although included a large number of traditionally middle class occupations. As such, it can be inferred that **MA** are broadly representative of typical visitors, but that they also include in their numbers a diversity of demographics that contribute different economic and gendered perspectives.

Regarding their personal data, **MA** attitudes and knowledge were mixed. Broadly, the data identified by **MA** was in line with the data types identified in the literature, the **S1** privacy policy content analysis, and the **S2** workshop with museum staff. **MA** identified 18 data types that appeared both in the privacy policies and the **S2** workshops, as well as a further 14 data types that appeared in one of the previous studies, but not both. There were 11 further data types identified by **MA** that did not appear as listed data either in the privacy policies, or in the previous workshop: Bluetooth, conversations, details of visit, dietary

requirements, distance travelled to attend, feelings/emotional responses, language spoken, level of education, notes/photos/sketches, visitor numbers, and worldview. These data types suggested by the **MA** offer some insight into what they expect to be valuable data to the museums and the priorities they expect the museums to hold. **MA** anticipate that museums are interested in collecting personal and behavioural data that would offer a deeper insight into the visitor as an individual.

MA believed behavioural data collection to be considerably more prevalent than seen in the actual practices of museums. As established, museums do not have the frameworks or resources to collect such data (Birch et al., 2021; Steel, 2012; Caldwell, 2002; Falk and Needham, 2011; Oakley, 2009; Allen and Petterson, 2016) but are extremely interested in finding ways to collect this qualitative and meaningful information (Carnwath and Brown, 2014). For example, use of space, details of visit, frequency of visits, group dynamics, emotional responses, motivation or incentives for visiting, and most popular artworks were all mentioned by **MA** but are rarely, if ever mentioned in studies one and two except as desirable information from the perspective of the museums. The data types identified exclusively by **MA** and the heavy reliance on behavioural data shows that **MA** are capable of making educated guesses on what data might be collected by museums. Data collection is so prevalent in everyday life that most people have a basic understanding of data collection practices and technologies already (Vitale et al., 2020). However, it is also clear from the data types highlighted that **MA** knowledge of data collection comes from a combination of social discourse (Foucault, 2016; Barnes, 1992) and knowledge of the practices of other organisations that may be more widely discussed, for example social media or Google (Tolmie and Crabtree, 2017), rather than from actively engaging in their rights as data subjects. Misinformation and misunderstanding of the reality of data collection can potentially be detrimental or even dangerous to individuals (Taylor, 2017; Hoffmann, 2020) and to their relationships with the organisations that collect it. Further, without understanding what data is being collected, members of the public are unable to thoughtfully and meaningfully donate their data, nor able to protect themselves from data misuse (D'Ignazio and Klein, 2020; Gilman, 2021; Chamberlain et al., 2017).

Fostering the education of visitors in social matters is a responsibility that has always fallen on the shoulders of museums (Bardzell, 2010; Dodd and Sandell, 2001; Simon, 2010), and

the heavy references to 'learning' being a central part of a museum visit by **MA** proves space for data education within the museum to be plausible. Further still, museums were shown to be imbued by **MA** with a higher than average level of trust to not just educate them, but to use their personal data for museum growth and social good (Dodd and Sandell, 2001; Duncan, 2002; Lourenço et al., 2020; Bhattacharjee et al., 2017). This was particularly visible in the recurring theme of emotional response, which **MA** highlighted as a big part of the museum experience both for internal reflection and for broad-scale understanding. The trust that audiences show museums is vital to the long-term relationships necessary to meet museum roles of education (Passebois and Aurier, 2004; Murphy, 2019) and for funding (MacMillan et al., 2005; Caldwell, 2002). However, ensuring that this trust is respected and maintained requires museums to carefully monitor social discourse and adapt to changing priorities. This is particularly difficult in reference to the implementation of technologies within the museum as technologies typically have a low level of trust, but especially technologies used for data collection (Macnaghten et al., 2015; Vorvoreanu et al., 2019; Sicart and Shklovski, 2020). However, in conceptualising potential applications for their data, **MA** showed a willingness to extend the trust they put in museums to the technologies the museums implement, provided they were able to see tangible and real impacts from those technologies positively affecting their museum experience.

Lack of relevant knowledge was also visible in discussions centring around the value of different data types. **MA** were overwhelmingly willing to share data that they deemed to be low value and did not express interest in being able to change that data in the future. However, data deemed to be medium to high value was more complex. **MA** were unwilling to share some high value data like mobile usage and payment information, despite such information being already broadly collected by museums (as shown in both **S1** and **S2**). Where such disconnect between attitudes and reality occurs, opportunity for agency and education are restricted. **MA** have reduced ability to take measures to protect data that they deem highly valuable, which could lead to sensitive data being shared against their wishes and a loss of trust between **MA** and organisation (Passebois and Aurier, 2004; Crabtree et al., 2016; Tolmie and Crabtree, 2017; Dwyer et al., 2007; Skatova et al., 2014). However, **MA** were willing to share some high value data such as (dis)ability or worldview. According to the literature around data sharing, it seems probable that such willingness to

share valuable data stems from the trust that **MA** have in museums to protect and carefully use their data to benefit both themselves and others (Skatova et al., 2014; Dowthwaite et al., 2021). Should lack of transparency around data collection damage this trust, **MA** willingness to donate data or to engage in the museum at all may be dramatically reduced. Data deemed to be of medium value to **MA** was also variable in whether or not they would willingly share it. **MA** expressed that their reticence or willingness to share certain data was directly related to their understanding of how such data would be used. If the **MA** were unable to understand why the museum might want or use such data, they were unwilling to share it. Increased transparency therefore shows promise in encouraging **MA** to share data, regardless of its value, with museums (Passebois and Aurier, 2004; Benson and Cremin, 2019; Sicart and Shklovski, 2020; Lynch, 2013).

Technical data was very rarely mentioned by **MA**, with only one reference to website data and no other mention of the technical data identified in privacy policies and by museum staff. This could be understood primarily from two perspectives. First, it may demonstrate disconnect for **MA** between the physical museum space and the digital presence of the museum. Understanding museums as a primarily physical space is historically valid, however with the development of technology (particularly the increased technology usage in response to COVID-19 (Galani and Kidd, 2020)) many museums are moving towards a more hybrid approach to collection, curation, archiving, and disseminating information (Zollo et al., 2021; Museums Association, 2018; Reeves et al., 2018; Eklund, 2020). The separation of online and physical museums may not yet be reflected in the public understanding and subjectivities of museums. The second perspective to consider is that digital collection and processing of data is simultaneously so opaque and mundane that members of the public do not feel equipped to speak on it, either because they do not know the answers or because they are unsure of what it means (Tolmie and Crabtree, 2017; Hoffmann, 2020; Taylor, 2017). **MA** showed a high capacity to make educated guesses on what behavioural and personal data museums might collect, but did not extend the same assumptions to digital data. The reality is likely a combination of both hypotheses – slow adaptation of public awareness of the digital capacity of museums *and* general lack of expertise and empowerment around data collect practices limits understanding of technical data collection.

6.4.2 How Audiences Make Museums Meaningful

In order to understand meaning-making in museums, **MA** were asked in the first activity to highlight their motivations, priorities, activities, takeaways, and the wider impact arts and culture has on them within a personal **Mural** board. In line with expectations set by the literature, the findings showed that **MA** have specific needs that they wish for museums to meet during their visit (Falk and Dierking, 2016; Simon, 2010), however, it is also shown that these needs are not necessarily formally or clearly definable by the visitors and that these nebulous needs are highly contextual and fluid. Despite this, the findings also demonstrate the *importance* of visitor needs being met, as when they are, the **MA** described being more likely to re-engage with the organisation *and* with culture more broadly in the future. This too is inline with expectations set by the literature (Falk and Dierking, 2016; Passebois and Aurier, 2004; Murphy, 2019), although rarely discussed in conjunction with the fluid and difficult to define nature of their needs. It has been a widely adopted practice in the past to turn to *personas* as a means of simplifying the needs of individual visitors and categorising them with others who attend with similar goals (Falk, 2009; Prentice et al., 1998; Antoniou et al., 2016). However, such categorisation often fails to accommodate for the inconsistency and fluidity of the needs of each visitor (both visit-to-visit and within a single visit). By limiting audiences to a single label, it also undermines the *agency* of the individual audience member to make sense of the museum in their own way and find novel ways to achieve their own needs, which **MA** demonstrated competency at achieving, inspite of *and* in conjunction with the affordances of the museum.

Audience ability to meet their own needs was demonstrated in the clear links between motivation to visit, activities undertaken, what the **MA** took away with them, and their reasons for re-engaging with the museum. **MA** described their motivations, needs, and priorities as both physical and non-physical, with the intangible more heavily referenced across the board. For example, educational content and inspiration were the most common motivations for visiting and the majority of activities described by **MA** as undertaken during a visit were intangible also, for example exploring the space, socialising, and discussing content with peers. Activities and motivation were closely aligned with one another, contributing to the understanding that **MA** visit museums for specific purposes and work within the confines of what is offered to make sure that their needs are met (Falk and

Dierking, 2016; Goulding, 2000), but also outside of what is formally offered through innovation and the use of everyday acts of resistance (Vinthagen and Johansson, 2013; Scott, 1985). This was visible in the activities defined by the **MA**, many of which are not explicitly catered for within museums but which proved to be popular and important activities; for example day dreaming, people watching, and self-exploration. In these ways, the visitors reclaim the space of the museum in defiance of the anticipated behaviours allowed for in the space, and resist the structures of education, elitism, and colonialism that are embedded in the museum context. As such, visitors create their own museum paradigm that attempts to ensure their visit meets their needs, their motivations, increasing the likelihood of them re-engaging in the future... As long as they believed that such needs could be met again, for example with new exhibit content or by visiting with different people.

The vast majority of **MA** reported a number of different motivations and activities each, with only four reporting exclusively being motivated by one incentive (seeing the exhibits) and three reporting only one activity carried out (two exclusively looking at the content, and one exclusively exploring the space) with no overlap between them. This means that all of the **MA** demonstrated some level of complexity within their visit, be that in the reason that they attend, the ways that they engage, or - as was the case for the majority - a combination of both. Further, the language used by **MA** also shines some light on the complexity of their visits, for example the use of the words 'wandering' and 'mooching' by a number of participants when describing how they navigate the museum. Despite the specific expectations placed on the visit to provide certain takeaways or opportunities, the language used suggests a calmness within the visit in which **MA** needs can be met ambiently or without rushing to achieve them. Being able to explore the space in their own time and in their own way is seen to be as enriching to the visit experience, for some participants at least, as the content itself (Prentice et al., 1998; Falk, 2009; Goulding, 2000). It becomes apparent then that visits are a holistic experience, and not singularly reliant on a specific goal or need in order to be 'successful'.

Further cementing the holistic view of the current museum visiting experience, the impact of arts and culture as described by **MA** on their broader life experiences and understanding of the world were also complex and myriad. From inspiration for their own artistic practices, to improved mental health, to knowledge of concepts and cultures, **MA** described a notable

impact on their personal lives. These broad-scale impacts have long been a prevalent point of discussion within the discourse surrounding museums across the spectrum from museums, academics, funding bodies, and governing agencies, with arguments for the importance of the intangible influence of museums from practitioners and researchers seemingly falling on deaf ears amongst policy-makers (Selwood, 2002; Caldwell, 2002; Murphy, 2019; Fleming, 2009; O'Neill, 2019). Looking specifically within the **UK**, a shift during the Thatcher years to quantitative, statistical measurement of impact (Selwood, 2002; Caldwell, 2002) has long been decried as detrimental to the arts sector as a whole, in which measuring such broad, intangible impact as described by **MA** in this study is near impossible. As such, funding to cultural organisations has plummeted, particularly outside of London, and arts and culture organisations are scrabbling to prove their value in metrics not designed to accommodate them (Allen and Petterson, 2016). However, in recent times the waters appear to be shifting once again to begin to account for the qualitative, intangible, and hugely vital impact of arts and culture on people and communities (Wook Kim et al., 2019; Darzentas et al., 2022; O'Neill, 2019; Murphy, 2019). Finding ways to collect and prove such impact, as demonstrated within this study, is therefore becoming a priority once again.

6.4.3 Re-imagining the Museum through Speculative Futures

Through the course of completing the activities, **MA** laid out their priorities and expectations for museums as well as potential ways that museums could better meet their needs through the collection and use of their personal data. **MA** showed that while their understanding of current data practices are limited to general assumptions, their willingness to share data that they deem to be relevant is broad. They also demonstrated a strong understanding of what data *could* be useful to the museums, particularly behavioural data that would offer museums a more comprehensive understanding of their audiences.

In discussing the value of the data to **MA** it became clear that different data holds different value for different individuals. This is broadly dependent on two things; the context of that data for the individual – e.g. minoritised groups might be less willing to share data that identifies them as minoritised groups; and the understanding the **MA** has of what that data will be used for. In speculatively prototyping different ideas for what museums could do with **MA** data, the **MA** demonstrated a willingness to share data that they otherwise were reticent to share, precisely because they could see the tangible outputs. For example, half of

participants said that they would not be willing to share information about their worldviews and the majority of **MA** would not share Bluetooth data, or mobile phone usage, but more than half of the suggestions of potential uses for audience data used these technologies to offer a meaningful interaction in exchange.

The prototypes suggested by **MA** were all in line with the priorities identified in terms of **MA** motivations, activities, and takeaways and covered many different elements of the museum visiting experience. For example, the idea of having reading and activities suggested to **MA** *before* their visit shows the importance of education and learning as a motivation. However, these suggestions also show the provision of broader contextualising information as an important contribution to motivating visitors to re-attend museums by empowering **MA** to better access, understand, process, and implement knowledge gained from the visit experience in line with their self-described needs. Whilst the capacity to do independent research before the visit is an existing option, many **MA** opt not to conduct such research (Vermeeren and Calvi, 2019). However, the suggestion of *personalised* recommended media indicates a desire for a way to undertake such endeavour without placing the onus on the visitor to research what knowledge is important or relevant beforehand. **MA** also described wanting the ability to make notes, store photographs, and journal about visits in one centralised location as a way to capture their feelings and responses to content as they go, as well as creating space for them to do their own research in the future and to draw parallels between different exhibits visited and their own lives.

Some suggestions went further than **MA**'s individual needs to also reflect **MA** attitudes to arts and culture more broadly in their day-to-day lives. For example requesting their data be used to generate live, interactive summaries of all visitor data demonstrates a willingness to understand the perspectives of other **MA** as an integral part of understanding the content within the museum. **MA** also highlighted an interest in recommendations of resources that would enable them to better connect exhibit content to broader topics and contemporary news stories. This is also demonstrative of **MA** desire to empower their learning in a range of ways that helps them to better apply what they learn to broader contexts. These suggestions show the perceived value of museums in furthering goals of empathy and understanding towards other people, cultures, and perspectives.

These suggestions were not just made in response to one specific audience goal, however. Rather, understanding how other people use the space, what pieces within exhibits are particularly popular, and potentially even sentiment data from other visitors can provide **MA** insight into how they themselves might like to navigate their visit (or not). Specifically, several **MA** made reference to wanting to know which areas of a museum were particularly busy at any given time in order to choose a quieter route for mental health, physical health, or neurodiversity related preferences. Increasing accessibility and inclusivity of museums for groups of people with different needs is already recognised as an important consideration by venues and funders alike (Walters, 2009; Allen and Petterson, 2016; Coleman, 2018; Simon, 2010). Increasing accessibility and inclusivity in different ways for different people is not just seen as a way to improve visitor outcomes, but also as an opportunity to better accommodate (and therefore increase attendance of) marginalised and minoritised people whose needs may differ from the majority (Simon, 2010; Dodd and Sandell, 2001; Galloway and Dunlop, 2007; Mason and McCarthy, 2006). It is also something that has been explored by two of the museums in **S2**, although neither opted to employ the required technology long-term. Interestingly, accessibility was only referenced by two participants in activity one, and not at all in activities two or three, but was a common consideration in the speculative activity. This suggests that in a space where **MA** attend to learn about the perspectives of others, they consider it deeply important for others to be able to also exist in that space.

In summary, most ideas generated in activity four revolved around using **MA** personal data to enhance the experience of an individual and their peers physically visiting the museum. Whether the enhancement centres around recommended media to contextualise the visit and enhance the understanding of the visitor, providing personalised routes around the gallery based on individual needs and interests, or suggesting other activities and places related to the exhibit – **MA** had a vast range of suggestions on how their data could contribute value to their visiting experience. Many of these opportunities require minimal disruption to physical infrastructure, and would provide museums with access to the qualitative, behavioural data that they so covet (Vitale et al., 2020; Darzentas et al., 2022). It is also clear from the findings that **MA** are willing to share personal data that holds meaning and value to them for a small amount of reciprocation from the organisations they share

that data with, lending weight to the advocated shift to understanding data exchange as a *relational* gift. However, the complexity and variety of the responses also shows that any future, large scale changes in the ways galleries operate must be optional for **MA** to engage with, and must not diminish their visiting experience if they choose not to utilise such changes. This is particularly important for **MA** with less technological knowhow or more experience and knowledge in engaging with specific historical content or artistic contexts. Even vouchers and special offers reflect the importance of visiting the café and gift shop.

6.4.4 Overcoming Limitations

One of the most challenging limitations of this study that had to be mitigated was in response to COVID-19 measures and having to rapidly re-structure the studies to be possible to run entirely online during national lockdown measures. In particular, this challenge surfaced in the reduced communication between participants. In post-structural feminism, discourse is a vital part of understanding phenomena (Kelemen and Rumens, 2008; Given, 2008b). To mitigate this reduction as much as possible, **Mural** was chosen to engage online **MA** as it would allow participants to see what other people had said in their responses. It was also decided to include the anonymised responses from the in-person workshop as a starting point for the activities, to provide as much interaction across participants as possible. Another challenge that arose in the digital conversion stemmed from the knowhow required to engage with the three technology-based alternatives (the website, YouTube, and **Mural**). For this reason, interested participants who completed consent forms were emailed detailed instructions for how to access the videos and activities, and it was stressed that I was available to be contacted by email at all times if needed. Additionally, the third YouTube video was largely dedicated to work as a tutorial for navigating **Mural**, as that was the software most likely to be unfamiliar to those taking part. None of the participants reported issues with accessing the various activities, and several emailed after taking part to say how easy and informative they had found the workshop. The final limitation to note was that it was not possible to completely monitor the participation – given that people took part anonymously and according to their availability, it was not always possible to know when **MA** were accessing the different activities or what they were writing. **Murals** were therefore monitored several times a day, and **MA** were assumed to have engaged with all activities once their first, independent **Mural** had been completed. Once contributions had

been added to the **Murals I** 'locked' them so they could not be edited by other participants. Finally, due to the changes in data collected (as described in 6.2.3), the method of analysis was changed from a reflexive thematic analysis to a content analysis to better suit the kind of data captured. This too has been described further in 6.2.4.

6.5 Contributions to Conceptual Framework and Summary

This chapter utilised content analysis to develop an understanding of how *museums as place*, *technology as mediator*, and *relational personal data* are experienced from the perspective of **MA**, building on the results of previous chapters to continue developing an overview of how data in the museum is understood and utilised. Further, the chapter also draws out speculative futures from participants, prompted by the findings of all three studies, that are capable of collecting meaningful (but elusive) data for museums and providing proportionate benefits to the data subjects. The findings are summarised below as an exploration of their contribution to the conceptual framework (Figure 10).

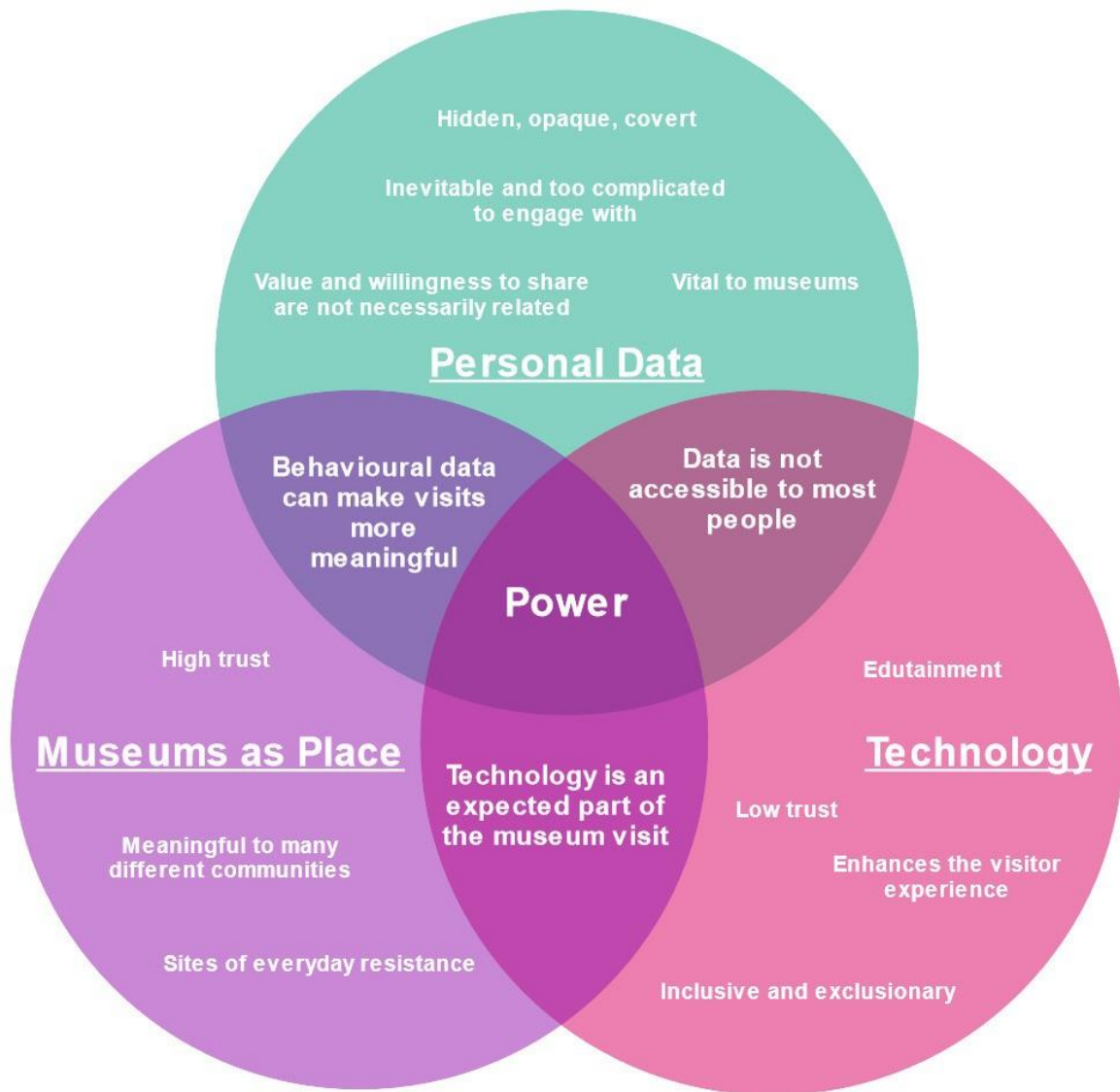


Figure 10. Venn Diagram of Conceptual Framework Contributions from Study Three

Quantitative data is currently prioritised within museums to capture specific metrics about visitors, however, qualitative data is widely recognised to better capture the intangible impacts museums have on their audiences and communities. This is reflected in the understanding **MA** have surrounding what data museums collect on them, wrongly assuming that subjective, behavioural data is more frequently collected, although rightly assuming it has more tangible value to the museum. The pre-conceptions **MA** had about what data was collected and their missing knowledge about data actually collected highlights opportunities and risks for the future of museum data collection. For example, **MA** were able to draw on social-level subjectivities and discourses to make educated

guesses and successfully identify many of the data types that were collected. Interestingly, **MA** also successfully identified several data types that are not typically collected but which museum staff also identified as highly desirable. These assumptions offer opportunities for easy expansion to collect the data museums want, but also risk backlash if visitors become aware of certain data collection practices that they do not consent to. One specific example that arose in this study was that **MA** were ignorant of current collection and reticent to share some data with museums that is already commonly collected such as Bluetooth and some mobile phone data. However, this same data was amongst the data that **MA** were willing to share *if* they understood how and why it was collected. In line with the previous findings, particularly those in **S1**, transparency is therefore shown to be a powerful tool for not only building but *maintaining* trust, which provides the foundation for long-term, meaningful engagement.

MA also defined the value of their data, which whilst variable, showed important trends in terms of what data they are willing to share. It became clear that **MA** are usually willing to share a range of data with museums, however, instead of basing their decision on how valuable the data is, **MA**'s willingness to share their data relied on how clear it was to them what that data might be used for, and why. This was particularly true when **MA** were speculating on how their data could be used in a relational exchange to benefit them or their community and enhance their visiting experience. When considering speculative futures for data in the museum, benefiting communities was an important motivation for data donation, be that through increasing accessibility or enhancing **MA** capabilities to understand others. This is both in line with the paradigm of donating data for altruistic reasons, and with expectations **MA** have of museums to be inclusive and educational. However, it was also an important motivation for **MA** that their data would be used to help them better meet their own goals during their museum visit, increasing their ability to engage with museums in novel ways that centre their own needs and motivations. This can both be understood as wanting data to provide new ways to engage, but also to support the everyday acts of resistance that **MA** have developed as part of their museum visit rituals. **MA** were able to identify a number of ways that they could envision their data being used towards these goals including personalised media, routes, and activities; accessibility information; and photography or journaling space. Increasing the agency of audiences to

meet their own goals in these ways provides a low-cost, inclusive way of improving outcomes for **MA** that is uniquely capable of responding to the fluid needs of the individual, and therefore improving long-term relationships, building trust, and expanding community.

7.0 Re-imagining the Museum: Study Four

7.1 Introduction and Background

This final study focuses on exploring how the conceptual framework of *museum as place*, *technology as mediator*, and *relational personal data* can be applied to reimagine the museum visit as something empowering to all **stakeholders**. Building on the sum of the knowledge generated so far, this chapter presents the process of designing, testing, and evaluating a technology probe, simulating a fictional technology for use in **museums** called **MuNa** (the Museum Navigation App) to prompt reflections and elicit meaningful contemplation of the future of data- and technology-enabled museums. Through this process, the study focuses on addressing the remaining gaps in knowledge needed to answer the thesis questions presented in 1.2 (Figure 11). In particular, it looks to evaluate the capacity of museums to affect discourses around personal data in meaningful and far-reaching ways that centre on mutuality, transparency, and value. To achieve these aims, the canon of research so far is subjected to a process of data-informed design fiction (see 3.3.4) that conceptualises a fictional future museum visit cognisant of the barriers, desires, and fears uncovered. From this design fiction, a probe version of **MuNa** is conceptualised that combines the priorities of museums and museum **audiences** to offer a holistic, personalisable museum visiting experience that enables relational, mutually beneficial data exchange between **visitors** and venues. Once conceptualised, **MuNa** is deployed as a technology probe and, owing to the continued disruption of COVID-19, tested online with participants attending a 3D virtual museum visited hosted by the researcher's industry partner Nottingham Contemporary.

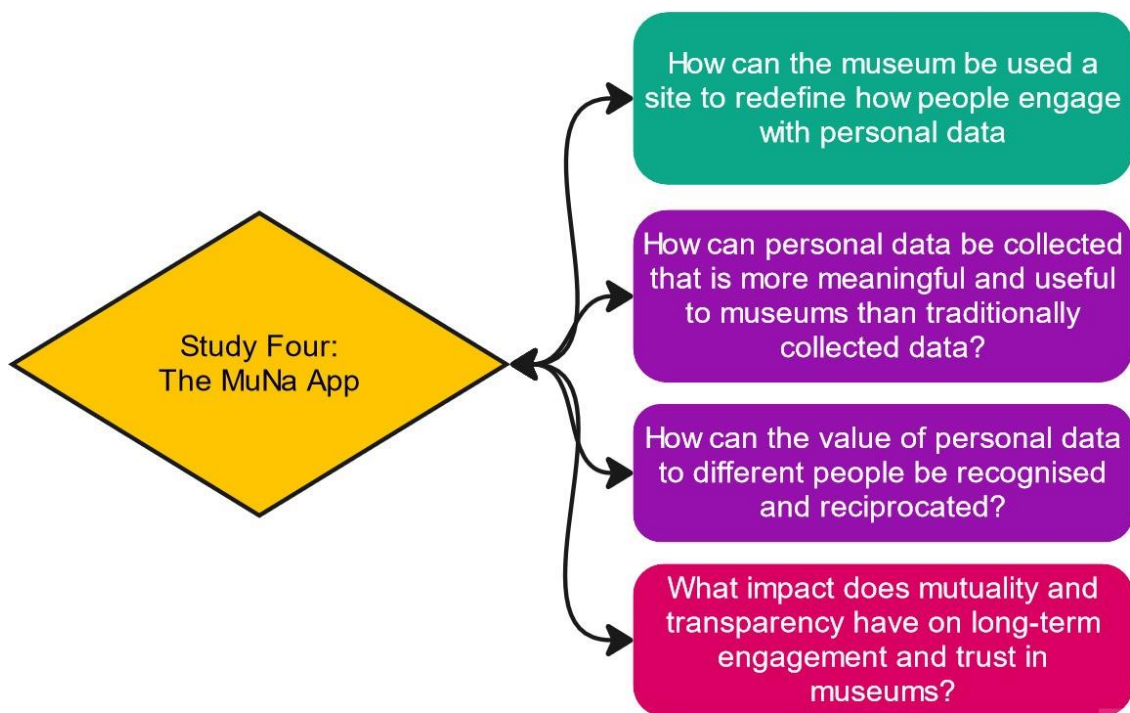


Figure 11. Sub-questions Addressed in Study Four

Beginning with a detailed exploration of speculating and designing **MuNa**, the chapter goes on to present a reflexive thematic analysis on interviews with virtual museum visitors (**VMV**) using the probe during their virtual visit. The chapter ends with reflections on the successes and failures of **MuNa**.

7.2 Designing the Study

This section details the design process behind study four including the design fiction, designing the technology probe, participant recruitment, the online museum, data collection, and analysis. The study was approved by the University's School of Computer Science Research Ethics Committee in February 2021.

This study uses previous findings as foundational to its design. It has emerged throughout the research process that current practices and priorities of museums typically focus on collecting data that is predominantly quantitative, and collection is restricted by budget, skill, and resources available (Birch et al., 2021; Caldwell, 2002; Murphy, 2019; Steel, 2012; Stam, 1993). This means that data is often collected from sampling visitors through questionnaires or through harvested data from online engagement (Zollo et al., 2021;

Caldwell, 2002; Murphy, 2019), despite evidence that these methods and the data they collect provide limited value to museums in furthering their goals (Carnwath and Brown, 2014; Caldwell, 2002; Murphy, 2019). Rather, personal data is harvested from audiences almost exclusively for funder reporting, and audiences have no accessible means of understanding what data is being collected from them, why, or who it is being shared with. Despite these opaque and potentially dangerous practices, museum audiences are shown to have higher levels of trust in museums than other, for-profit organisations (Lourenço et al., 2020; Bhattacharjee et al., 2017; Bekkers and Wiepking, 2011), and are still willing to share their personal data with museums. Further, audiences are shown to be willing to share even more detailed, qualitative, behavioural data with museums than they would with other organisations *if* the museum is able to demonstrate positive uses of those data that also benefit the audience. This study responds to these findings and speculates a potential, low-cost, low-risk avenue for all stakeholders to be empowered to reach their own goals, whilst also meeting the needs of the other stakeholders.

7.2.1 Using Technology Probes to Elicit Reflection

Probes are a popular method used in **HCI** research to provide insights into the lived, unknown experiences of people that are otherwise hard to capture (Hutchinson et al., 2003; Gough et al., 2022). There are a variety of types of probes that are utilised to address a variety of research problems and questions. This thesis draws on technology probes, a specific type of probe that:

...combine[s] the social science goal of collecting information about the use and the users of the technology in a real-world setting, the engineering goal of field-testing the technology, and the design goal of inspiring users and designers to think of new kinds of technology to support their needs and desires. (Hutchinson et al., 2003: 18)

To achieve these goals, technology probes provide users with tools that enable them to engage with scenarios in non-typical ways and reflect on what technologies might affect their experiences in the future.

Technology probes differ from other kinds of probe due to the situated nature and capacity for information gathering. Alternatives such as the original cultural probes, developed by

(Gaver et al., 1999), tend to capture non-technical insights into (hopefully) unmodified user behaviours as a means of inspiration, for example through the use of physical tasks like journaling and photography. On the other hand, technology probes as used here are low-fi applications that gather in-situ data from the modified behaviours of users engaging with a specific, novel technology within a real context (Boehner et al., 2007). Vitally, “it is not a prototype, but a tool to help determine which kinds of technologies would be interesting to design in the future” (Hutchinson et al., 2003: 18).

Technology probes therefore require two key elements; a low fidelity technology to be situated in a context, and the capacity for users and researchers to reflect on and analyse their interactions with it. For the probe itself, (Hutchinson et al., 2003) distinguish five key elements to consider in the design and implementation. Technology probes must be flexible to allow for re-interpretation and novel usage. They must be usable only in so much as they must provoke reactions and insights – therefore certain functionalities may be deliberately excluded. They must log data about users, which can be used in analysis and reflection both from the user perspective and the researcher perspective. Finally, they should be used to challenge pre-existing idea and influence future design. Other researchers have also noted that technology probes should embrace ambiguity as a catalyst for reflection (Gough et al., 2022; Boehner et al., 2007).

Technology probes are also, vitally, able to be deployed in conjunction with co-creative and participatory processes as, in line with New Museology principles, they can make space for multiple voices to be heard and negotiated (Gough et al., 2022), although it is contested how participatory technology probes can be when they are initially designed by researchers (Boehner et al., 2007). To counter this critique and to create a technology probe that is meaningful to users, (Gough et al., 2022) used a co-design and participatory approach to developing their technology probe by deliberately integrating the positionality of the research team in its conception. Similarly, this thesis deploys a technology probe that has co-creativity embedded within its inception, as it has been designed according to the contributions of prior participants, whose input and insights have defined every feature available in the probe. Further still, the probe itself leaves space for co-creative re-imagining of the museum visit, with space deliberately left for unexpected or novel behaviours described in the previous studies to be conducted and expanded on.

7.2.2 Using Design Fiction to Re-imagine the Museum

In order to design the **MuNa** probe, I turned to the practice of research through design; specifically I turn to the practice of design fiction. Design fiction is an increasingly popular design method in **HCI** and broader academic fields that encourages reflection, interpretation, and consideration of social, psychological, and ethical elements of design (Baumer et al., 2020; Linehan et al., 2014; Wong et al., 2017; Ballard et al., 2019). By integrating the data presented in previous chapters and with the support and input of Dr Velvet Spors, a fellow student at the time of the study, we developed a method of *data-informed* design fiction, detailed further in 3.3.4, that supports a speculative technology to be built designed from an existing data set. Using this method, we wrote a design fiction that re-imagines the museum visiting experience as accessible, inclusive, and technologically enhanced in response to the identified needs and desires of venues and visitors. It shows The Visitor attending an art museum in their downtime. The Visitor has various mental and physical requirements, inspired by the experiences of museum audiences in **S3** that must be met for The Visitor to fully engage with the museum. These barriers are addressed, primarily, through their use of **MuNa**. **MuNa** is presented as a not-for-profit mediating application that transparently transfers data between visitors and museums and offers visitors personalised features based on their shared data. This fiction is presented in full in Appendix Four, and excerpts are provided throughout this chapter for reference.

The iterative process of writing, re-writing, condensing, expanding, and finalising the design fiction was completed over the course of a week. As shown in Table 11, the functionality of **MuNa** in the design fiction is entirely drawn from the findings of studies 1, 2, and 3. The remainder of this section demonstrates how these findings were integrated into the design fiction, and subsequently how they were taken forward into designing the technology probe that developed from it.

Table 11. *MuNa Functionality Origin Points*

Functionality drawn from findings	Explicitly desired by audiences	Explicitly desired by museums	Appears in design fiction	Appears in probe
Personalised notifications	x		x	x

Editable personal information	X		X	X
Personalised contextualising media	X		X	X
Archiving of content	X		X	X
Sharing content with peers			X	X
Archiving of behaviour		X	X	X
Live museum information	X	X	X	
Physical accessibility aids	X		X	
Mental/emotional accessibility aids	X		X	X
Physiological data		X	X	
Further information on content	X		X	X
Personalised routes	X	X	X	X
Easy monetary donation		X	X	
Data shared with museum	X	X	X	X
Transparent data collection	X		X	X

To begin, The Visitor receives a notification from **MuNa** of an exhibit relevant to their interests:

You flick back to the homepage and zone in on your new notification. MuNa explains in a bright, crisp font, that this new exhibit is being recommended to you because you had previously updated your preferences to suggest that you wanted to be intellectually challenged. The new exhibit contains topics that you have not formally engaged with before, it says, and will present these ideas in a way that you may not be familiar with.

Personalised notifications about relevant exhibits was a feature that audiences identified in **S3** as information they would like in exchange for their data on related interests. **MuNa** explains why the exhibit has been shared with The Visitor (familiar venue, challenging content, related to interests) and offers The Visitor chance to edit their interests and motivations if it was incorrect. The example motivations **MuNa** used to select the exhibit for The Visitor are drawn directly from the audience workshops, as motivations for visiting was data that audiences identified overwhelmingly that they were willing to share with museums. Museum staff also identified that motivations for visiting and interests were qualitative data points that they were explicitly interested in collecting in order to understand their audiences better, offering valuable behavioural data for the museum. Further, the ability to edit motivations was also highlighted as important to most audiences regarding their preferences and interests.

The Visitor is offered a selection of personalised media related to the suggested exhibit that would enable them to understand and contextualise their visit:

You mark that you are interested, and MuNa generates a list of some basic media that you might enjoy before you go. It knows the exhibit content is new to you, so the content it suggests is rudimentary and easy to follow. You remember a few months ago when you went to yet another exhibit from one of your favourite artists and the app had suggested much higher-level media that went deep into the background of the exhibit on show;

inferring, based on your previous usage, that you already had the basics covered and would want to dive deeper.

Personalised media was identified by several audience participants in **S3** as a desirable feature that would empower them to better engage with unfamiliar content, particularly when, as in the story, it is tailored to reflect the level of knowledge they have about the exhibit content based on previous usage. The media suggestions were also designed to offer multiple perspectives on a topic as a challenge to The Visitor to think about different viewpoints. This optional mode of engagement was also suggested by audiences, both in terms of meeting personal goals to expand horizons through their visit, and as something that should not be obligatory to engage with if not wanted. This theme is also continued after the visit, in which supplementary recommended media is shared based on the engagement of the visitor with different objects and themes. To further enable The Visitor to contextualise knowledge gained in their visit, **MuNa** gave The Visitor chance to engage in onsite research about specific pieces they saw by looking through relevant archival media attached to it through an augmented reality lens. More detailed information about exhibits was also a common request from audiences in **S3** who were keen to learn more about specific content or creators to enable them to better reflect on and draw parallels with their own lives. Not only would such engagement give museums better understanding of what content is resonating with whom, but audiences also expressed that they were more likely to buy merchandise from the gift shop related to content they had connected with, providing both data and financial benefits to the museum.

Accessibility and inclusivity was identified by audiences as an important feature of museum visits capable of being both opportunities and barriers. In the story, accessibility and inclusivity was acknowledged in a number of ways. First, as an infrastructural issue, solved in the story by a personal bot that could offer the visitor a seat in any place where they might need it. Accessibility and inclusivity were also identified as things that could be tackled through the use of responsive technology. The Visitor was asked for permission to enable tracking throughout the museum. By consenting, they were given personalised routes based on a combination of their interests, business of different areas of the museum, and their preference for that specific visit. The Visitor chose a personalised route that would take them to see something new to them in line with their visit motivation. Had they been

visiting under a different pretence or had informed the app they wanted something different that day, the trajectories offered to them would have options able to accommodate those differences. Again this was something identified by audiences as desirable for both physical and mental accessibility, but is also something that two of the museums in **S2** identified as having been trialled within their museums, but ultimately dropped due to lack of resources to maintain and analyse it. Providing different options to the visitor of personalised routes overcomes some of the limitations of previous attempts discussed in 2.4.2 to guide visitors around a museum by being responsive to the different needs of different visitors at different times. It also provides a meaningful way for museums to capture and understand movement data through the exhibits.

Finally, The Visitor was given multiple opportunities to reflect on different elements of their visit:

You beeline for the kitchen when you get home and settle in for the remainder of the evening with a cup of tea. You open up MuNa once again on your AweSpex and idly flick through the various pictures and notes you captured earlier, shifting the order and position of them until you are satisfied that it makes sense to you. You casually add some new annotations to the Portrayal and Aesthetics of 'Great Leaders' section with thoughts the podcast had prompted on the way home; power can come from many places, including illusory portrayal, you note.

As identified in the gifting literature (Darzentas et al., 2022; Benford et al., 2022), enabling reflection on the user journey is an influential tool for empowering the user to understand their emotional journey through an exhibition. This was also highlighted by audiences who asked for visualisations of their own and other visitor data, and a way to journal about or record their visit. The Visitor in the story made use of both of these elements to varying degrees. The visit summary offered data about how long they spent at certain pieces, their route around the museum, and their physiological response to different exhibits. Such data was happily shared by audiences in **S3** and they did not require the ability to alter such data in the future. While The Visitor chose not to look at this data, they did opt in to sharing it

with the museum, noting that **MuNa** had previously explained to them why and how the data was collected, and what the museum used it for:

MuNa asks if you would like to see your summary. The summary shows you the route you took around the exhibit, which pieces you spent the most time with, and even which pieces prompted the strongest physiological reactions in you. You've never really bothered with the summary, it's a function for other people, you think, but you don't deactivate the summary in your settings. You never do. It helps the gallery, after all. You remember MuNa walking you through the different kinds of data it collected and telling you what that data would be used for by the various museums when you first set up your profile.

Audiences also noted in **S3**, aligning with related literature (Passebois and Aurier, 2004; Benson and Cremin, 2019; Lynch, 2013), that transparency was an important element in learning to trust organisations and therefore share personal data with them. **MuNa** therefore acts as a mediating application between visitor and venue, in which The Visitor has full control of what data they were willing to upload to museum servers. Reflecting this concept, The Visitor knew and trusted the museum they visited because they understood what was collected and why, and they therefore opted to share their information with both app and museum. Having visitors willing to share this personal data with the museums was also explicitly a desire of museum staff in the **S2** workshop as it would provide meaningful, accurate, qualitative behavioural data that the museum could utilise both internally and externally.

The Visitor also made use of the archiving capabilities of **MuNa**, which was a very popular suggestion by audiences, to record and better reflect on their thoughts, feelings, and reactions to their visit both short- and long-term. Audiences were overwhelmingly willing to share emotional responses to exhibits as they believed this to be valuable feedback for the museum and wanted to see their responses have a tangible impact on their future visits. While it may not align with the values of some museums, for example two of the museums in **S2**, to alter future exhibits based on feedback from visitors, it can still have a tangible impact on the visitors' own experiences. This is explicitly considered in the design of **MuNa**

so that feedback from visitors can shape their own engagement and future recommendations, without providing additional work to museums. This behavioural data also had other value to museums and was explicitly labelled as desirable by all museums in **S2** and commonly throughout the literature (Carnwath and Brown, 2014; O'Neill, 2019; Selwood, 2002; Caldwell, 2002; Murphy, 2019; Fleming, 2009) as a valid measure of impact, and as such as a useful resource to audiences, museums, and funders. **MuNa** also offered The Visitor the option to share certain content with a personal contact. Whilst this functionality did not come up in discussions with museum staff or audiences, it was shown in the gifting literature to be very successful in prompting meaning-making (Darzentas et al., 2022; Spence et al., 2021) and so was included in the design.

On evaluation of **MuNa** in preparation for creating the technology probe, it became clear that the data collection processes conducted were still underrepresented within the story. Increasing transparency of how and why data is collected was a prevalent theme in both the literature and in the audience workshops in **S3**. As such, this was considered to be an important element to emphasise even further in the probe. Another important factor to consider in developing the probe was that COVID-19 was still causing wide-scale disruption, closures, and risk to public safety, and so the decision was made to use a virtual museum exhibit that visitors could attend from their own homes. This necessitated the removal of functionality around emotion detection and other physiological data. As the technology of an online visit was also likely to be novel to the **VMV**, it was also decided to limit the number of potential routes offered in order to focus on not overwhelming the **VMV** and to be able to support them in navigation. One final change was in the visualisation and sharing of **VMV** data with each other, which was removed due to not being able to establish a baseline prior to starting and to protect the privacy of **VMV** in an academic context where datasets would be too small to ensure anonymity between **VMV** who may know each other.

7.2.3 Choosing the Museum and Recruiting Participants

Prior to the closure of the **UK's** museums in response to COVID-19, Nottingham Contemporary had begun to record their exhibits in conjunction with V21 Artspace¹⁹, a digital solutions company who specialise in recreating exhibitions in a digital medium.

¹⁹ <https://v21artspace.com/about>

Through this collaboration, Nottingham Contemporary became able to provide interactive 3D Virtual Tours online created through a combination of laser scanning and multimedia technologies²⁰. The 3D virtual tour offers users a 360° photographic space in which users can navigate by clicking on hollow circles across the floor (Figure 12). Multimedia elements of exhibits are often supplemented by videos, and the experience also includes a 3D map of the space (Figure 13) and a measuring tool. Nottingham Contemporary made their 3D virtual tours available to the public during the pandemic through their website as an inbuilt web app²¹.



Figure 12. A Screenshot Taken in Gallery Four of the Virtual Bauhaus Exhibit

²⁰ <https://v21artspace.com/about/interactive-3d-virtual-tours>

²¹ <https://nottinghamcontemporary.org/record/still-undead-popular-culture-in-britain-beyond-the-bauhaus/>

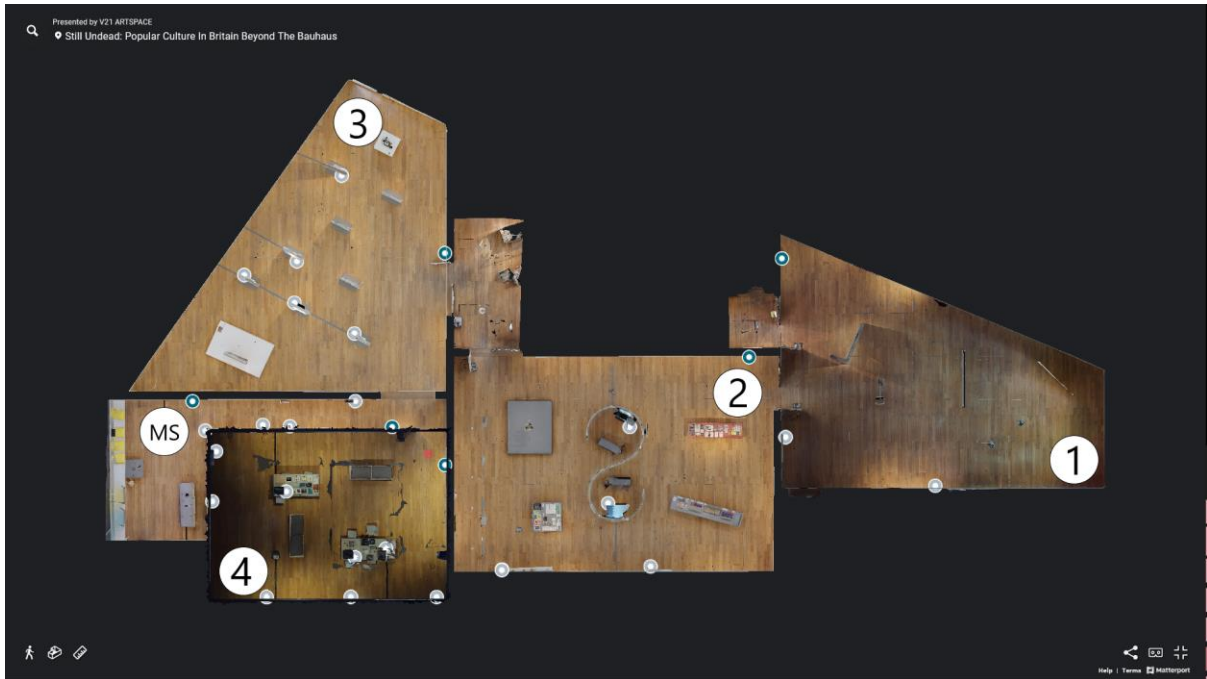


Figure 13. A Screenshot of the Floorplan Provided for the Virtual Bauhaus Exhibit

Nottingham Contemporary, at time of writing, offers virtual tours of eight of their previous exhibits dating back to 2018. The exhibit *Still Undead: Popular Culture in Britain Beyond the Bauhaus* was chosen for this study as I worked at the museum during the time it ran, and so was very familiar with the content. The Bauhaus exhibit ran from September 2019 – January 2020 and celebrated the centenary of the Bauhaus school of design, featuring contributions from 50 artists across four gallery spaces. Gallery one (Figure 13, point 1) explored experiments in light and sound, gallery two (Figure 13, point 2) looked at basic design, gallery three (Figure 13, point 3) looked at fashion, the maker space corridor (Figure 13, point MS) showcased music and sound, and gallery four (Figure 13, point 4) was based on performance. All five virtual spaces had interactive multimedia elements either as videos or slideshows.

Participants were recruited online through social media channels and word of mouth. Fifteen participants reach out to express an interest in taking part in the study. I responded to each potential participant with details of the study, the university privacy notice, an information sheet, and a consent form (Appendix Five – Information Sheet and Consent Form for Study Four

). Twelve participants returned completed consent forms and took part in the study between March and July 2021. All participants took part in 2-3 online sessions using Microsoft Teams. The first session established a relationship between the visitor and myself, ensured informed consent, and participants completed a preliminary interview to establish baseline knowledge and complete their **MuNa** profiles. The second session was the virtual museum visit and participants could choose to complete their final interview directly after the museum visit or arrange it for within a week of the second session. Requirements for the study were that participants be over 18, spoke English, and had visited a **UK**-based museum or gallery within three years of the study.

7.2.4 Collecting and Analysing the Data

In order to explore how **VMV** would interact with **MuNa** and the impact it would have on **VMV** attitudes, three slightly different versions of **MuNa** were developed to explore different options for transparent data collection shown in Figure 14. Four participants were assigned to each group randomly. The first two groups (Groups A and B) would focus on promoting ethical and transparent data exchange with important information and options to consent available at different times in their visit. These versions would give the user an in depth explanation of, and options to control, what data would be collected by the app and what data would then be shared with the museums. Group A would have the option to choose which data could be collected by **MuNa** prior to their visit, and which data could then be shared with the museum once their visit had ended. Group B were asked to choose which data could be stored by **MuNa** and shared with the museum after their visit. Group C, in replication of current data collection practices, were not provided any information on data processes or options to consent to any of the data collected or shared (not including consent gained as a research participant).

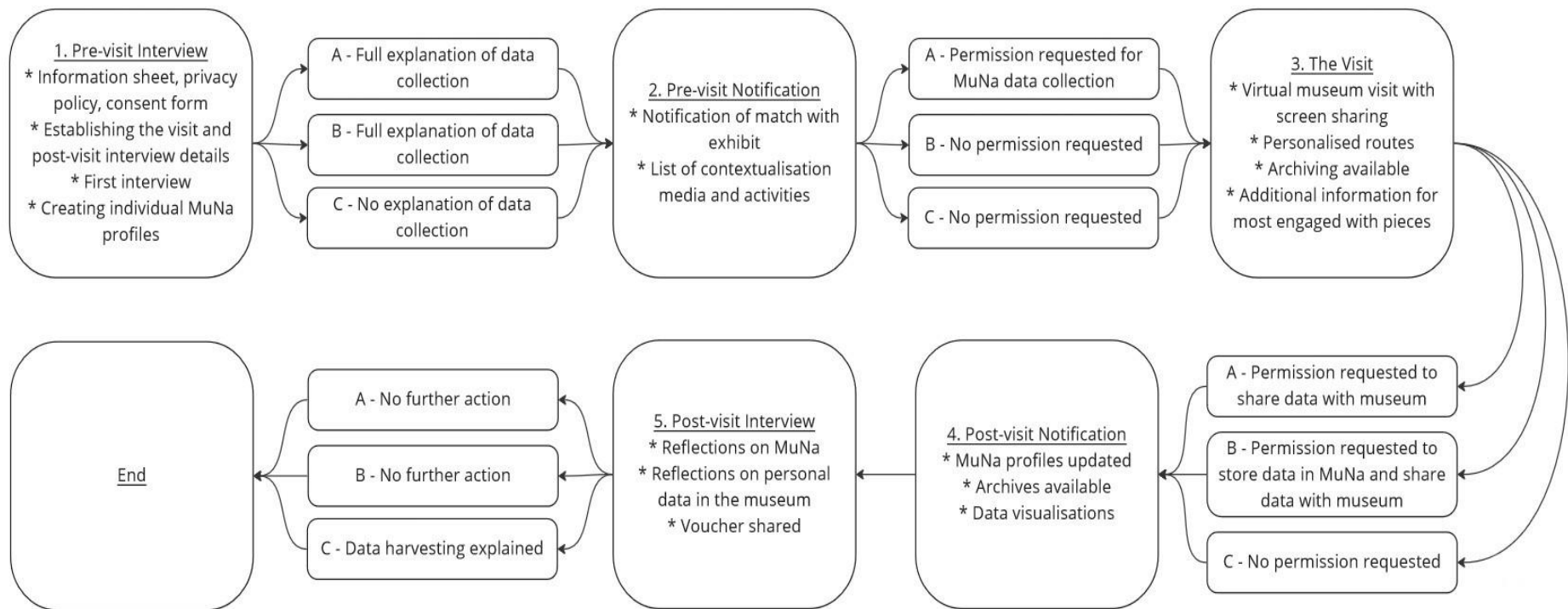


Figure 14. Flow Chart of Group Trajectories

Interviews were conducted on Microsoft Teams and recorded with verbal and written consent through Microsoft Teams. During the first interview, participants discussed their current understanding of personal data and their attitudes towards museums and galleries in general and were supported in filling in a **MuNa** profile page using **Mural**, an example of which can be seen in Figure 15 (see Appendix Six for larger version). As MuNa was deployed as a low fidelity technology probe, the app was shared with them as seen in Figure 15. The technology probe was shared in this way to enable in the moment reflection and as a prompt for verbal discussion, allowing participants to cross-reference different screens, ask questions, and easily change their answers.

For any data collected by MuNa, participants could click the button to learn about why it was collected, who it would be shared with, and how it would be used, at which point I would verbally offer the information requested or answer specific questions. All participants were informed that MuNa was acting as a middleman between the participant and the museum. Groups A and B were assured that data collected would be stored locally on their device until they gave permission for MuNa to store and analyse it, and further only shared with the museum with the explicit permission of the user. Group C were only given further information if they chose to use the button and request it, at which point they were informed that data collected was stored by MuNa and shared with the museum visited.

In line with the expectations and usage of technology probes described above, the probe as shared with users had ambiguity built in to allow for deeper reflections and meaningful engagement. Language used like 'something new' or 'being intellectually challenged' in prompting for motivations acted as prompts to encourage users to consider what they wanted from their visit, and in doing so to discuss and concretise how the technology might affect their visit positively, negatively, or neutrally.

Participants were also invited to provide additional information about their typical museum visiting habits to act as a proxy for long-term use of MuNa, for instance offering information on who they typically visit with, how often they visit, and what they had enjoyed about previous museum experiences. As the primary purpose of the MuNa app was to elicit responses and discussion, and due to the manual preparation required to make the technology probe functional in terms of creating maps, researching specific art pieces, and

creating personalised media lists, it was decided to only offer one exhibit recommendation to all participants.

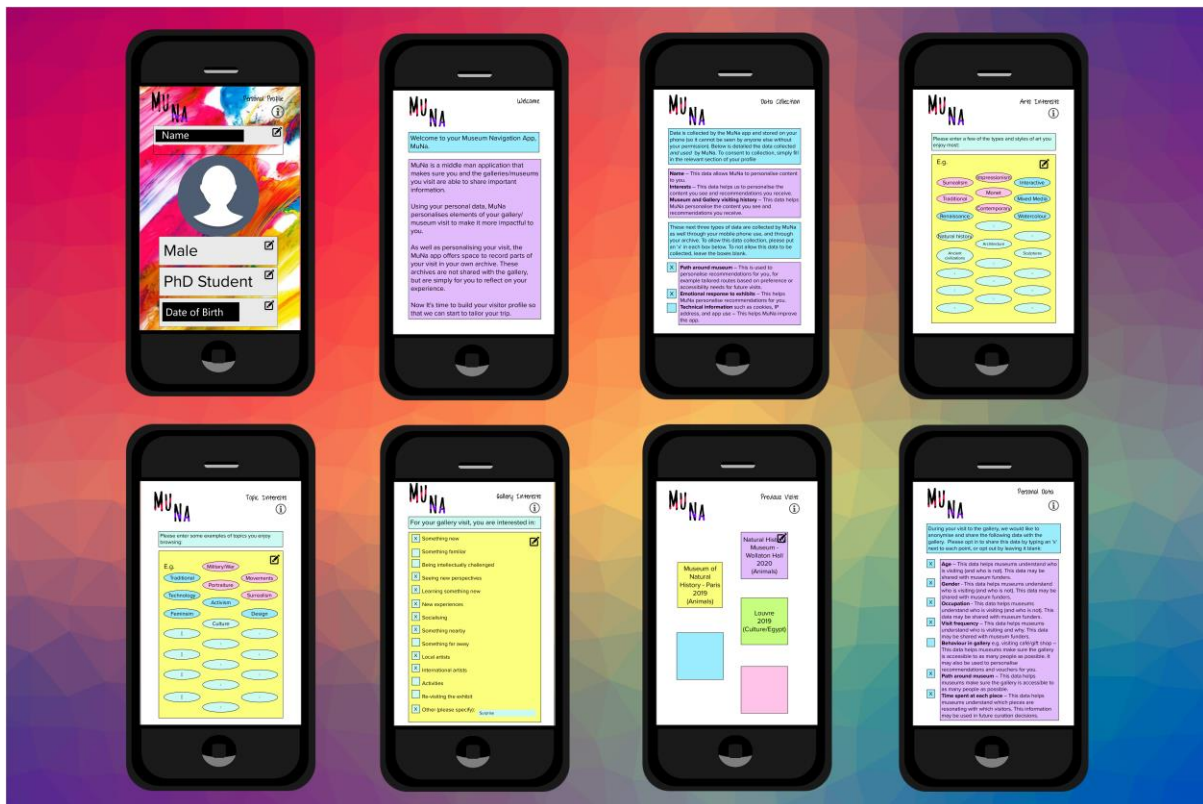


Figure 15. Arthur's MuNa Profile

Following the interview, profiles generated were manually scrutinised to determine interests, art preferences, and existing knowledge levels. An email was then sent to the participant, mimicking an app notification, in which they were invited to attend the Bauhaus exhibition, explaining which of their interests the exhibition was relevant to, and including a personalised list of multimedia resources:

MuNa has identified an exhibit available that matches your interests in [x, y, z]. The Nottingham Contemporary hosted an exhibit on the Bauhaus in 2019 for the 100th anniversary of the Bauhaus school called Still Undead: Popular Culture in Britain Beyond the Bauhaus. This exhibit is now available as an interactive, virtual exhibition.

MuNa has selected a broad range of media for you that you may like to engage with before your visit. These resources offer a wide overview of the Bauhaus, its history and impact, as well as some activities to further contextualise the exhibit contents...

Pre-visit resources were manually compiled and shared with **VMV** based on elements of the user profile such as related interests, knowledge of the topics on display in the exhibit, people they might visit with (e.g. children), and motivations for visiting. Resources included reading, videos, pictures, and activities.

Participants were then invited to a second online session. Consent was reaffirmed and participants were reminded of the purpose of the study. The **VMV** were then sent the link to the online exhibition space and were asked to share their screens through Microsoft Teams. Visitors were informed that they would be able to explore the exhibition at their own leisure, but that I, on behalf of the app, would interject at certain points with recommendations for their visit. All visitors were initially given the option of being directed to a personalised starting point selected as most pertinent to their interests. During their visit, I would interject with suggested art pieces to engage with and further contextualising information about pieces the visitor showed interest in e.g. revisiting or spending longer than average time there. I also offered personalised routes around the gallery based on interests and on additional needs the user had explicitly mentioned, for example suggesting alternative routes if a certain area were 'crowded', or highlighting where seating could be found. Finally, I offered visitors the ability to archive pieces that they interacted with, including capturing verbal or written notes to contextualise the pieces for re-engagement post-visit. All recommendations made were based on information provided through the profiles and from the pre-visit discussion. During their time in the virtual gallery, data from participants was collected regarding their route, which exhibit pieces they interacted with and for how long, which pieces they archived or shared, and their overall time spent in the museum.

All participants except for one opted to complete the final interview immediately after completing their virtual visit. This meant that for 11 of the participants, stage five was completed after stage six (Figure 14). During the final interview, participants were given opportunity to discuss their experience and offer feedback on the virtual museum visit.

Participants were then invited to discuss **MuNa**'s collection and use of personal data. Group A were asked which data could be shared with the gallery. Group B were given their opportunity to opt in to which data could be stored within the app *and* shared with the gallery. Group C were informed of the data collected and shared and given opportunity to discuss their response to such collection.

Finally, using **Mural**, I generated individual archives for each **VMV** that contained any art pieces visitors had saved or shared with a peer, along with notes they left and some basic visualisations of their route around the gallery and time spent with art pieces. I also gave notification of changes to the profile based on their behaviour in the gallery, for example adding or removing interests based on which pieces were most and least engaged with. Participants were invited to edit their profiles if they did not agree with the changes by re-accessing their personal **Mural** board. An example of an archive can be seen in Figure 16 (see Appendix Six for larger version). These archives were emailed to participants within a week of their visit, again replicating an app notification, and inviting the participant to respond with any final thoughts or feedback.

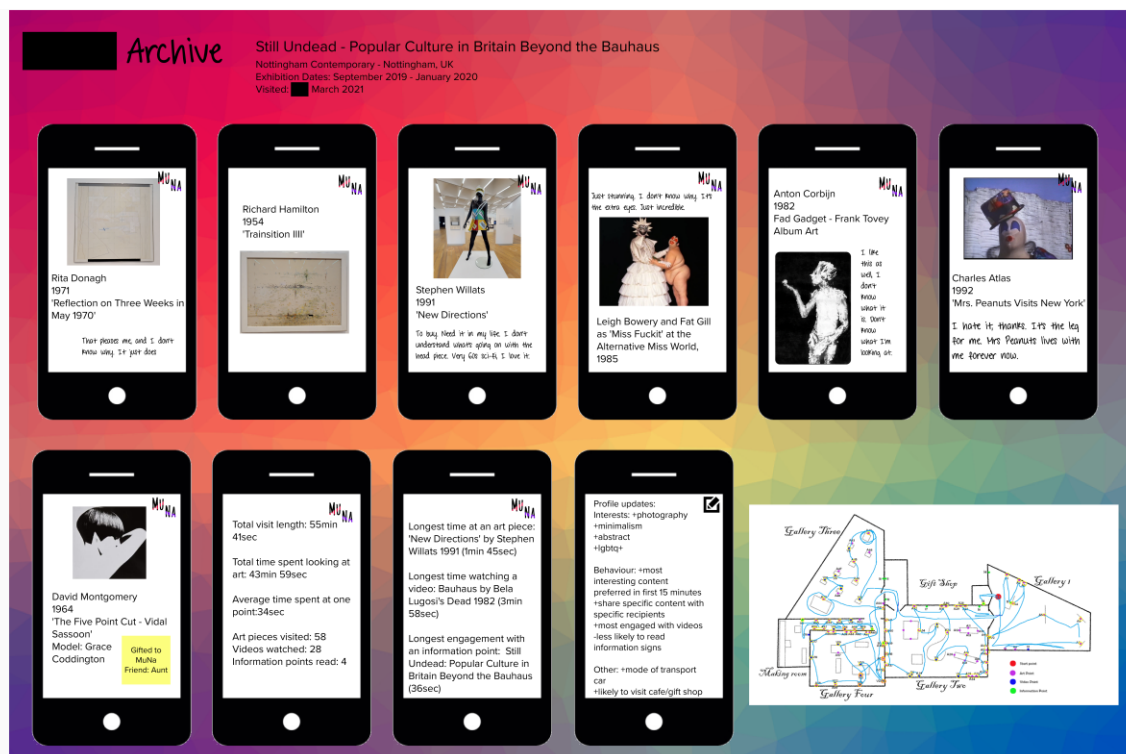


Figure 16. Alice's MuNa Archive

For each participant, interviews were fully transcribed into .docx format, profiles and archives were downloaded from **Mural** and saved as .pdfs, and visit statistical data was manually scraped from video footage and filled into an Excel spreadsheet. The spreadsheet contained data pertaining which pieces **VMV** visited, the order they visited them, how long they spent at each piece, a map of their route around the gallery, and any pieces they archived or shared.

Transcripts and profiles were then subjected to a full, inductive, reflexive thematic analysis as detailed by Braun and Clarke (Braun and Clarke, 2006; Braun and Clarke, 2019; Braun and Clarke, 2020) and described in 3.3.3 using QSR NVivo (version 11) for Windows. Once again, for transparency of my own positionality, please refer to 3.1. Applying the epistemological lens of post-structural feminism (see 3.2), nodes were carefully and inductively identified within the texts, with particular attention paid to any examples of power or knowledge being overtly or covertly demonstrated. Once initial nodes were identified, they were checked for consistency in their content and then manually organised into initial themes. The process of coding was subsequently iterated several times further. For each iteration, texts were fully re-read and coded into nodes. Nodes were then checked for consistency and accuracy of their content, with definitions of each node updating to reflect the findings. Nodes were also continuously checked against themes, and themes were reactively shaped to address questions of power, trust, data, technology, and museums according to the nodes.

7.3 Findings

This section details the findings of the analysis conducted on the data collected during **VMV** virtual visits. I begin with an overview of participants and their engagement with the app. I then investigate the differences found between the three different groups, before moving onto presenting the findings of the reflexive thematic analysis.

7.3.1 The Participants

A total of 12 participants took part in the virtual gallery visit using the **MuNa** probe as a visit mediator and prompt for discussion. **VMV** were given the option to self-describe their gender identity, date of birth, and occupation as part of their **MuNa** profile. A summary of **VMV** demographic details can be seen in Table 12, where each participant has also been

assigned a pseudonym that will be used to refer to them throughout the rest of the chapter. The table also shows which group each **VMV** was randomly assigned to. Participants were predominantly male (8/12) and half were university students (6/12)²². Participants' ages have been categorised from the date of birth provided and were predominantly in their late 20s. **VMV** were also given the choice to access all of the different features available in **MuNa** including pre-visit resources, personalised routes based on interests, and a personal archive to store exhibits and view statistics about their visits. Table 12 also shows which visitors engaged with each feature. The majority of participants engaged with all of the features and all participants engaged with at least one feature.

²² The study was not advertised through University channels, and students that participated were representative of a broad range of academic institutions not limited to the University of Nottingham.

Table 12. Virtual Museum Visitors Demographic Information

Pseudonym	Group	Gender	Age Category	Occupation	Pre-Visit Resources Used	Personalised Route Used	# Exhibits Archived	Would they Use MuNa Again
Frankie	B	Did not disclose	Did not disclose	Student	No	No	5	Yes
Alice	A	Female	Late 20s	Student	Yes	Yes	7	Yes
Marvin	A	Male	Late 20s	Technical Support	Yes	Yes	5	Yes
Tricia	C	Female	Early 30s	Student	Yes	Yes	5	Yes
Arthur	B	Male	Late 20s	Student	Yes	Yes	9	Yes
Benjy	C	Male	Early 60s	Manual Labourer	Yes	Yes	0	Yes
Will	A	Male	Late 20s	Student	No	Yes	9	Yes
Rob	B	Male	Late 20s	Researcher	Yes	Yes	12	Yes
Sheila	C	Female	Did not disclose	Administrator	Yes	Yes	0	No
Ford	C	Male	Mid 30s	Student	No	Yes	2	Yes
Eric	B	Male	Late 50s	Journalist	Yes	No	4	Yes
Eddie	A	Male	Early 60s	Chief Executive	No	No	3	Yes

Pre-visit resources were accessed by 8/12 of the **VMV**. Will and Eddie said that they had not had time to read them. Ford misunderstood the purpose of the resources and thought he were supposed to wait to access them for our Teams call. Frankie explained that they had their own rituals to prepare for a museum visit and said that they would not use this feature. 9/12 **VMV** opted to explore the museum following the recommended route suggested to them by **MuNa**. Frankie, Eric, and Eddie explained that they preferred to explore museums in their own way without interference from either the museum or any other external influence such as the app. 10/12 made use of the archive function to store specific exhibits, voice notes, or reminders to look something up at a later date. Benjy and Sheila chose not to use the archive function explaining that they would be unlikely to re-visit it in the future. 11/12 participants expressed that they would use **MuNa** again for the various features it offered, and only one participant, Sheila, said that she would not. Sheila explained that she visited museums as a way of ‘escaping’ from her normal routine and so she did not desire any influence on the way she chooses to engage with the museum, although this might change once she retired.

7.3.2 Comparisons between Groups

Throughout analysis, differences between groups A, B, and C were less pronounced than anticipated. Attitudes towards the data collection practices used were similar across participants regardless of group, with all groups expressing a desire to have the option to choose what data to share, and all groups expressing surprise at current practices. However, several important points emerged that showed the different experiences of participants depending on their assigned group. A reminder of participants’ assigned groups can be found in Table 12, and an overview of the path different groups experienced in Figure 14.

All groups were asked to provide some standard personal data as part of their **MuNa** profile. Groups A and B were also asked to consent to data being shared with the app, and with the museum. Table 13 shows which data points **VMV** agreed to share with **MuNa** and Table 14 shows which data they agreed to share with the museum. Within groups A and B, half the participants agreed to share all of their data per group (4/8 total), and half chose to decline to share certain information (4/8 total). The most controversial data points were occupation and technical information, for which 2/8 **VMV** given the option not to share such data, declined to share it. While there were no notable differences between groups A and B in

terms of how much data they were willing to share with the app or museum, group B expressed a strong preference for their option of being asked to donate their data *after* their visit. Group A, on the other hand, expressed no strong feelings about when they were asked to choose.

Table 13. Data Virtual Museum Visitors Shared with MuNa

Name	Group	Data Shared with MuNa						
		Name	Gender	Age	Occupation	Path Around Museum	Emotional Response	Technical Information
Frankie	B	Yes	No	No	Yes	Yes	No	Yes
Alice	A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marvin	A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tricia	C	Yes	Yes	Yes	Yes	N/A	N/A	N/A
Arthur	B	Yes	Yes	Yes	Yes	Yes	Yes	No
Benjy	C	Yes	Yes	Yes	Yes	N/A	N/A	N/A
Will	A	Yes	Yes	Yes	Yes	Yes	Yes	No
Rob	B	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sheila	C	Yes	Yes	No	Yes	N/A	N/A	N/A
Ford	C	Yes	Yes	Yes	Yes	N/A	N/A	N/A
Eric	B	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eddie	A	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 14. Data Virtual Museum Visitors Shared with the Museum

Name	Group	Data Shared with Museum						
		Gender	Age	Occupation	Visit Frequency	Behaviour in Gallery	Path Around Museum	Time at Each Piece
Frankie	B	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alice	A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marvin	A	No	Yes	No	Yes	Yes	Yes	Yes
Tricia	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arthur	B	Yes	Yes	Yes	Yes	No	Yes	Yes
Benjy	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Will	A	Yes	Yes	No	No	Yes	Yes	Yes
Rob	B	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sheila	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ford	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Eric	B	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eddie	A	Yes	Yes	Yes	Yes	Yes	Yes	Yes

During their final interviews, **VMV** were given opportunity to discuss their experience with **MuNa**'s data collection practices and to further explain their choices, where given, in choosing to share certain data or not. The most notable difference came between the groups given information and choices regarding their data collection (A and B) and the group not given that capability (C). In groups A and B, all eight participants explained that they were more willing to share their data with the museum specifically because they knew what was being collected and why, although Alice still showed a high level of distrust, explaining that data abuse has been so pervasive in her experience that she struggled to trust the app:

Alice: I think that's just where I'm at at the moment, because that's, I think that's what's happening a lot anyway with data gathering, so until it does start becoming more valued practice to just be completely upfront then I'm just gonna distrust it inherently, even if it's just a little bit.

This lack of trust was present, although less extreme, in a number of the other participants who explained that while they trusted the app to collect their data, they were still sceptical of how the data might be used by the museum. However, apart from Alice, all other **VMV** in groups A and B described an increase in their baseline level of trust for both app and museum due to the transparency and agency afforded by it. Participants from groups A and B also expressed an increased willingness to share their data because they understood the societal impact their data could have, for example if the museum used the data to better reach underrepresented groups or to acquire more funding. Group C on the other hand, upon receiving the explanation about the experiment, expressed disappointment and frustration that they were not pre-emptively given information about data collection.

All participants expressed surprise at the amount of data collected, but also indicated resignation and acceptance of exploitative or hidden data collection practices 'because you know, everyone use Google, you know, in the world. If you use Google, it's collecting like everything about you, so you can't run away from this data collection, so the museum is the, not big deal for me' (Ford). All four group C participants expressed a low baseline of trust in the museum to securely store their data and only use it in ways the **VMV** would approve of, for example not selling it on to third parties. Group C also made note of not understanding

why museums would want to collect the data that they did, and explained that this lack of understanding was an important factor in how much they trusted the museum, and in what they would theoretically be willing to share if given the choice.

7.3.3 Reflexive Thematic Analysis

A reflexive thematic analysis was conducted on interview transcripts, the **MuNa** profile, the **MuNa** archive, and data collected during the museum visit for each participant. Five themes were identified from the transcribed datasets. Table 15 shows themes, theme description, and nodes.

Table 15. Reflexive Thematic Analysis Codes and Descriptions (Study Four)

Theme	Description	Nodes
Participant Attitudes to Personal Data	References made to personal data that can offer insight into how people perceive, understand, or resist personal data collection practices and use.	Data assumptions
		Data attitudes are heavily contextual
		Data collection is mundane and unavoidable
		Data has tangible or quantifiable value
		Ignorance surrounding current personal data practices
		I'm not doing anything wrong so why should I care
		Social or communal ramifications of data
Contextualising Power in the Museum	References to how power is experienced, understood, resisted, or perpetuated in the museum.	Hidden or mundane power
		Institutions have power over their visitors
		Museums are an authority on their content
		Power is relevant to other stakeholders
		Reclamation or deviance in the museum
		The visitor has power over their own interpretations
The Presence of Trust in Museum Experiences	Implicit or explicit references to trust (or lack thereof) towards museums, technology, personal data, or a combination of the above.	Demonstrating trust in technology
		Overt or covert fear
		Increased trust increases willingness to share
		Mistrust is deeply embedded and will take time and resources to overcome

		Perception of institutions or organisations affects levels of trust
		Transparency increases trust
Museums as Place	References to audience understandings of the museum as a physical or metaphysical location including impact and responsibilities.	A desire for replication of the physical
		Museums have a responsibility to educate
		Museums have impact beyond their physical location
		The museum is a building and cannot be replicated
Technology as a Tool for Re-empowerment	References to the ways that technology can positively or negatively impact audiences, particularly regarding their museum visits.	Contextualising is vital to understanding exhibits
		Disruption as a positive influence
		More engaging pre-visit prep increases engagement
		Technology can increase accessibility and inclusivity
		Technology enabling post-visit engagement
		Technology or interactivity can be a barrier
		Technology or interactivity make museums more memorable and enjoyable
		Visit preparation is just practical information and or basics

7.3.3.1 Participant Attitudes to Personal Data

The theme *Participant Attitudes to Personal Data* encapsulates discussions about the values of personal data, knowledge and opinions on data collection, and perceived uses of personal data amongst participants. Interviews with **VMV** showed a complex tapestry of information regarding attitudes with some universally accepted knowledge, as well as some contradictory knowledge. For example, some data capturing technologies were widely believed to be ubiquitous ‘because you know, everyone uses Google, you know, in the world’ (Ford). With that ubiquity also came an assumption that widespread data technologies were inbuilt with safeguards to protect data rights that are believed to be inherent, for example Alice ‘thought that kind of went without saying. I thought you had to treat personal data with some sort of respect anyway’.

Despite these widespread beliefs among participants that data rights are a default position, they were also aware of some level of exploitation happening with their data. However, most **VMV** expressed an understanding that such exploitation is inevitable and that there is no alternative way of gaining access to goods and services they want to access, without granting organisations the ‘rights’ to exploit their data. As such, **VMV** have developed different expectations for different kinds of organisations in which charitable or non-profit organisations like museums have higher expectations placed on them in terms of proper safeguarding, ethically using, and not selling on visitor data. This is particularly noted by participants in comparison to social media companies and for-profit corporations who are expected to exploit and misuse personal data. This is summarised by Ford who qualifies that ‘if it’s non-profit it’s OK for me. Yeah, not like Facebook, you are not like this, Facebook sell them, they just collect to sell them to someone’. Part of this attitude stems from a lack of understanding about data collection practices:

Sheila: I didn't have to put down my address or phone number, so in my experience I have no idea how, unless I've got a chip in me, there's, they haven't asked me for anything, so I don't know how they would collect anything.

When presented with examples of actual data collection practices, almost all participants expressed surprise in the ways data can be harvested and used. The most discomfort **VMV**

expressed as a result of this exchange came from learning about how data might be collected about other people in their circles as a result of the **VMV**'s data being collected.

Another contradiction arose from what **VMV** expect their data to be used for. Despite knowing that data is often misused, and even expecting data to be sold on to third parties or used to the detriment of the data subject, participants still wanted to believe that their data is being collected and used for social good. In line with the literature, **VMV** expressed more willingness to donate their data when they believed it would be used with positive social outcomes. Upon further questioning, this idea often stemmed from an understanding that 'I'm happy to share most of my data for whatever reason people may think it's useful to them as long as they don't bombard me with marketing material because I understand that it can be used for a beneficial purpose' (Eddie). This can be understood as an awareness that data could be misused, but that most negative outcomes would not come back to affect the **VMV** personally or the people they cared about. Further, **VMV** also demonstrated that whilst they internalised the idea that data use could be beneficial to society, they recognised that most data value goes to the organisation handling the data, followed by other stakeholders, all before any benefit trickles down to make positive societal change. As such, participants often struggled to identify any personal benefit that data collection enabled.

7.3.3.2 Contextualising Power in the Museum

Much of the discussion that came from interviews with **VMV** participants demonstrated ways that power was experienced, perpetuated, and even resisted during engagement with museums. Such experiences with power were often subtle or covertly discussed as mundane 'facts' hidden within day-to-day experience. How these power structures were understood and explored were multitudinous and complex in the ways they interacted with each other. For example, matters pertaining financial costs of museums often linked in with discussion or understanding of class. (Dis)ability was often also tied to class but also linked directly with accessibility. Accessibility came up in discussions relating to education level and ethnic background or race. Such discussions were inextricable from each other and showcased how complex and varied visitors and their data can be. However, some of the ways these mundane powers are experienced were visible to participants, for example several participants pointed out the positioning of gift shops at the exit to museums as a

display of power as it forces visitors to interact with non-essential elements of the visit. This was particularly noticed by participants who tended to visit with young children such as Eric who feels that he is 'quite often (...) forced into it because they tend to put the exit routes through them, but it's... It's not often a choice'. However, many more mundane displays of power were embedded inside assumption and 'facts'. For example, assumptions made by visitors about the target demographic and subsequent accepted behaviours:

Marvin: Sometimes it can feel, can feel like it's quite stuffy and I, I really, personally, if something is like that I really, generally don't want to be there, and it makes me not engage with anything at all, anything that I might be slightly, might be interested in, if the atmosphere of the place is very much a hands off, don't touch, if you, if you say bad words then you'll be totted out kind of place, then yeah, I'd just walk around, keeping out for where the toilets are, and keep myself to myself

Alternatively, **VMV** also discussed struggling to engage with content because of assumptions made by the museum themselves. These assumptions came in many forms such as assuming visitors can easily navigate an exhibit to see it from different angles, or failing to provide contextualising information with the assumption that visitors come with a baseline level of knowledge. This can be perceived by visitors as 'gatekeeping to also keep it as something that you need to break in yourself, that you need to know, have all of this background info to be able to appreciate art and I think that's quite shit' (Frankie). These hidden power structures exclusively emerged as ways the museums maintain power over visitors, be that through gatekeeping access to content as described above (deliberately and accidentally) or through the choices museums make in what content to present and how:

Tricia: It's a very good idea sometimes because you need a guidebook or you try to find some way to start and you know it's kind of, because I'm from [another country] and the European direction than the UK directions different in museums, therefore sometimes I'm just... Which way do I need to go inside?

Such gatekeeping was most keenly described by visitors with alternative physical or neurological needs such as Eric's children who 'ended up with dyslexia inherited from their

mum's side of the family, and you know (...) being able to do a lot of reading of signs and things is difficult for them'.

The power identified by **VMV** as gatekeeping relies on another assumption; that museums are experts on their content. Museums are often imbued with great levels of trust by society, extending to the idea that content exhibited by museums is likely to be objectively 'true'. This manifests as another facet of hidden power and can lead to detrimental impact on members of the public unable to access that content physically or intellectually. As such, every **VMV** demonstrated at least one way that they personally made sense of museum content in covert, often invisible acts of everyday resistance. Examples included the ways they navigate physical space, photograph or note down specific exhibits for future reference, or utilise resources provided by museums. This was often described as an important part of making the museum space more fun and engaging. This motivation could affect the entire visit, for example Frankie and Eddie deliberately going the opposite way to any recommended routes, or Marvin noting that if he were using **MuNa** in the physical museum space he would have 'tried to draw a penis with my, with my walking path' as the app tracked his movement.

Such resistance emerged as an important part of the museum visiting experience as it allowed **VMV** to interpret and remember content in personalised ways unavailable (or unsuitable) otherwise. In creating space for themselves to interpret and understand new knowledge in relation to their own experiences, personalities, knowledge, and situations, **VMV** then found visits to be more meaningful in the long term.

7.3.3.3 The Presence of Trust in Museum Experiences

The presence of trust in museum experiences as a theme explores the ways that participants perceive technology and personal data as trustworthy or untrustworthy in different contexts, in particular within the museum. In line with the literature, technologies were demonstrated by **VMV** to inherently have low levels of trust connected to them. This fear stemmed primarily from an inability to understand how the technologies worked or what the implications might be if such technologies are misused:

Frankie: There might be some, I don't know, like threat vectors that I can't think about right now for myself, but I guess something like if I'm in the

closet and I go to a gay exhibition and somebody finds out and it's like in the sense that you have some kind of, you know, you can maybe make assumptions about people's lives so their lifestyles or whatever and not every, not every group, community, family, country is so open minded that it is cool so there might also be something there that people say 'oh you're into like deviant shit', you know

However, **MuNa** was implicitly granted higher levels of trust than the literature would suggest, with **VMV** not only demonstrating trust in it to collect and use their data appropriately, but also trusting the outcomes even if they contradicted **VMV** knowledge and assumptions. For example, Fred noted in discussing whether the choice of exhibit was tailored well to him that 'maybe it's not directly linked my interests, maybe because of my give the wrong information to you maybe, just I choose something on there last time that's gave me this one'. However, Fred rationalised the recommendations as being based on his self-reported visit motivation of '[choosing] before I am just, yeah, keen to learn, keen on to see something new, yeah, it works for me', showing a willingness to find something about the exhibit that suited his needs even if he would not have chosen to visit the exhibit for himself.

VMV also expressed higher levels of trust in the cultural institutions collecting the data via the **MuNa** app than in daily technologies and other organisations capable of collecting personal data. This trust stemmed from perceived motivations of museums to only use data collected for beneficial purposes 'if they're going to process data, and they are, because everybody does now, it's finding a, finding a way of doing it openly and in a way that people actually understand, which, you know, which isn't as easy as it sounds I suspect' (Eric). However, this trust was noted to be delicate, with higher levels of initial trust being linked to more severe consequences from **VMV** if such trust was broken. For example, a breach of trust might result in no longer sharing data, or even no longer revisiting a museum, compared to broken trust in organisation like social media not affecting the behaviours of **VMV**:

Eddie: Of course, you know, my attitude might change if I find that there's been a data breach somewhere, you know, say, for instance, you know the

[Museum] for instance had a data breach and you suddenly found that the information there has been leaked out or used inappropriately, then I'd think differently about sharing that information in that particular location in the future

In discussing why trust in museums to collect and use personal data in line with the values of the visitor might be higher than other organisations, **VMV** often explained that museums have more of a responsibility to the public to be open and transparent about their practices. In fact, transparency frequently emerged as an important value assumed to be inherent to museums by participants. Further, the levels of perceived transparency deeply affected the data **VMV** were willing to share, with participants showing more willingness to share data labelled as valuable by audiences in **S2** if they could understand how and why it was collected. This was also noted to change broader attitudes to data collection as 'I think we quite often see the negative impact of it, and we don't necessarily see the positive impact of it. And if the positive side of it was more prominent than people might be a bit more giving and a bit more trusting than they are' (Eddie). However, it also became apparent that data shared with museums in response to transparent policies might be more selective and limited in breadth of information shared than data harvesting might offer, although it would also be more willingly donated and more likely to be accurate, updated, and shared with confidence:

Eric: I quite often click prefer not to say for those sort of questions, but everything that's on that panel as I was reading down it, I could see, well, yes I can, I can, I can see why that would be a benefit to knowing who's coming to see an exhibition and how might we need to tweak it in the future

Despite the positive feedback on **MuNa**'s data sharing and donation increasing trust and engagement with personal data, it was also clearly demonstrated by **VMV** that the mistrust surround technology and data collection are deeply rooted in social discourse and very much embedded in knowledge and understanding of data. It would, therefore, take time and resources to truly convince **VMV** that transparent data collection practices were being implemented:

Marvin: I think that's just baked-in biases when it comes to personal data collection. I think that's just the attitude that I take whenever I see anything that's to do with collecting data on me, it's, my attitude is usually so obfuscated, it's so opaque usually that I'm always assuming, I'm always assuming that they're sneakily inserting the anal probe as we speak, you know

Trust and fear are clearly deeply intertwined in this scenario. Whilst museums have a stronger starting point for **VMV** trust, they also have more to lose when such trust is broken.

7.3.3.4 Museums as Place

Museums are afforded certain assumptions and expectations by **VMV** because of the museums' physical presence and capabilities. For example, it is commonly understood that museums reflect the society within which they are positioned, evolving to challenge, mirror, and critically highlight the principles and subjectivities of their visitors and communities. The symbiotic relationship that museums can have with the space around them has wide-reaching impacts on people and place. This was shown by the attitudes of many of the participants who viewed museums not just as a means to access content or as an activity, but as something that fundamentally affects the ways they see the world. **VMV** described the act of visiting museums as an event that provides moral lessons, inspiration, and knowledge that impacts daily life in numerous ways including improved mental health, access to like-minded communities, and for some like Sheila, creative inspiration, drawing on the physicality of the museum to reshape their own worlds:

Sheila: I'm a semi-creative person but I definitely like creativity around me, so it inspires me to, inspires me to fix my garden, or decorate my walls, or make my own artwork, or, this is really cheesy but it kind of gives me a little bit of life

Beyond the space it inhabits, the physicality of the museum itself also has an important role to play. For instance, by affording modes of tactile engagement, museums can become active places that visitors can use to reach their own goals. The physically embodied museum was shown to have important tangible and intangible elements that were not

found in the virtual gallery used for this study. Participants like Marvin expressed frustration at not being able to interact with physical exhibits, such as one part of the exhibit that had blocks which visitors were encouraged to move around.

Marvin: Cool. Oh can I actually touch and move the blocks?

Researcher: You can

Marvin: Oh! Oh good! I would spend a very long period of time here, not gonna lie. This is the, yeah, yeah. Yeah. I would take all the blocks and I would be making some sort of super-structure. I'm not gonna lie. This would be so cool. How would I make, make here... Oh I would definitely make something that would roll along the spherical bits, so I could just take it, like I would turn it and it would roll along and I would put another one in, that's how it would go. That's great. What's the thing above? That's a video... OK, I've stopped. I'm moving along the wall. Yeah, I want to emphasise to you how much time I would spend here with this

Participants also found it challenging being unable to judge elements like texture, smell, or dimensions of pieces, explaining that it added a barrier between the exhibit and the visitor that prevented them from connecting with the content physically and emotionally. Lack of physicality was also deemed a concern for visitors who frequently attend with others. The social affordances of museums is deeply impactful and constitutes an important motivation for visiting, and facilitates more meaningful outcomes for visitors. **VMV** found the online experience to be isolating and lonely, despite the presence of myself in the call, and as such struggled to conceptualise how the **MuNa** app might be used in the physical space when attending with others. However, **VMV** were generally optimistic that continued technological development and novelty could make steps in overcoming shortcomings and better work to complement the physical site:

Frankie: I think that's very nice to see it like this, that's really cool, and it also does make you feel like you're visiting a gallery, but I think there needs to be an extra layer for it to work in such a digital way that you can't do in person.

As such, **VMV** were considerably less engaged with the online content than they said they would have been in the physical space, often to the disappointment of participants who expected at least equal levels of engagement. Participants suggested that the main reason for the virtual visit being less engaging was because the virtual space was attempting to replicate the physical space but was unable to mimic the tangible qualities that define a museum visit. Instead, **VMV** frequently suggested that virtual museum content should not be working to replace the museum, which was irreplaceable because of its physicality, but should instead work to enhance physical engagement.

7.3.3.5 Technology as a Tool for Re-empowerment

Whilst participants described technology as a conduit of fear in some contexts, for example acting for surveillance, selling data on to spam callers, or risking personal safety, **VMV** also discussed technology as a positive influence with the potential to encourage constructive changes to personal data, power, trust, and place. In these contexts, technology was discussed by some participants as having the capacity to empower them and offer new ways of engaging with and understanding museums than traditionally available. For example, in 7.3.3.2, there was discussion around the accessibility of information for visitors from different backgrounds and with different needs. The technology used by **MuNa** was explained by **VMV** as providing multiple potential methods to access and contextualise the information on display. Examples highlighted by **VMV** included **MuNa** interrupting their visit with curated suggestions, archiving allowing for future personal research, or tailored information presented before the visit giving new insights into the content on display, all of which were overwhelmingly considered to have a positive impact on the visit experience. Sheila in particular found **MuNa** to be helpful:

Because sometimes I skim things and, and unless something grabs my attention, I just skim and I just walk around quickly and then if something really interests me then I stop and I concentrate, so it was really nice to, to do that and then have her [MuNa] mention some things, because then I realised, oh, I didn't see that. And then I would go back and then look at it in a different light.

Another commonly mentioned improvement enabled by **MuNa** was the increased contextualisation enabled by the technologies as 'I was actually wondering looking back at some of the pictures like what the pictures were actually depicting, they seem quite interesting but I don't know what the background of the picture was and I'd like to know maybe that kind of stuff' (Will). Enhancing contextualisation through tailored information was a popular feature that allowed **VMV** to absorb the content in ways they self-described as more meaningful, analyse content more effectively, and apply knowledge to their own daily lives.

Some of the technologies enabled by **MuNa** are commonly available to the general public before visiting museums. For example, looking up information about an exhibition before attending and taking notes during a visit are possibilities for any person with the requisite resources (e.g. internet, library, mobile phone, notebook), but **VMV** overwhelmingly demonstrated that such options were not part of their typical museum visit practices. Participants explained that they did not engage in researching content prior to their visit because of lack of time, spontaneity of visit, or not knowing where to start. Some participants did describe taking notes during their visits and many mentioned taking photographs, however they also explained that this content was often lost within camera rolls and note apps meaning it was not usually revisited. Therefore, participants explained that having options presented to them in tailored ways to engage with content before, during, and after their visit that was accessible in one location made it considerably more likely that they would choose to use these contextualising tools again. Further, **VMV** also noted that they were more capable of drawing connections between different exhibits 'like for example with the shape things which I like noticed and like, you knew that this poster was like one significant one in the exhibit, or like the other like book, was like, oh, that's not the right colours, why?' (Arthur). Participants also showed an increased ability to apply learned knowledge to their daily lives and understand content by drawing on their daily lives when equipped with such contextualising tools:

Eric: Tell you what, the task I have sort of, set myself, if I can figure it out by the end, is whether, whether there's any declared influence with the, with Disney's Beauty and the Beast and that ballet [the Triadic Ballet] that you sent me a link for

Researcher: Oh, really?

Eric: Yeah, that was the first thing that jumped out at me as I watched the little video of the ballet, was the, the cups saucers and plates dancing about on the Disney video

Researcher: I'd never thought of that, that's so interesting

Eric: I didn't bother looking into it any further, I thought no, let's just see if it, if it pops up out of, out of this visit

Part of this deeper understanding of content came from the way that **MuNa** catered to different **VMV** needs and visiting priorities. For instance, the archive was extremely popular with a number of participants who were prolific in their archive making and note-taking as they explained that they wanted to be able to revisit and do further research on certain elements. Other **VMV** most enjoyed the personal media recommendation provided before the visit as it let them understand what they were looking at as they explored, even if they had no previous related knowledge. This was particularly true of **VMV** who considered themselves 'a visual learner, I'm very type of visual type of person so therefore I like to see things and do things and that's the type of visit that I find more stimulating' (Eddie).

The ways that technologies impacted **VMV** were further noted to be long-reaching, as well as wide-reaching. Participants made mention, for example, of the ways that content from personal archives could be re-accessed and 'will be very interesting maybe two years later when I read them (...) I can compare my today's feeling and two years ago what I thought' (Tricia). It was not just content that was interesting to participants long term, however, for example Marvin was excited at the concept of revisiting the visualisations and details of his visit such as routes, time spent engaged, and changes to profile:

Marvin: If I could have a look at that, if it was, if it was tracking that stuff, I would, obviously I would love to see that sort of thing presented 'cause I'm a stats nerd myself like oh, how have I interacted with the stuff and, and being able to see myself presented

However, the long-term and wide-reaching potential impact of **MuNa** was often paired with participants highlighting concerns around the potential barriers that technology can present some visitors. In particular, concerns around age were raised by participants who worried

that older visitors may feel unable to participate in the app due to lack of skill or lack of smart phone. Other potential barriers mentioned by **VMV** included the required time commitment to set up a profile, become familiar with the technology, and update preferences afterwards. This was of particular concern for visitors with young or large families, for example Sheila who has 'got three kids, I've got the job, I've got the house, I'm too busy for this, but I, if I imagine myself, my exact persona when I'm retired and I don't have all these responsibilities? That's a different story'.

7.4 Discussion

So far, this chapter has presented the findings of a reflexive thematic analysis conducted on data collected from participants attending a virtual museum. Representing the findings of studies 1, 2, and 3, the **MuNa** app was used to explore how meaningful data exchange can be conducted to benefit all stakeholders. This discussion section unpacks the findings of the app deployment and reflections on the app, and pulls on the canon of produced knowledge from across the thesis to understand what elements of the conceptual framework are highlighted or affected through the use of the app.

7.4.1 The Impact of Transparency on Visitor Willingness to Donate Personal Data

One of the key findings that has consistently emerged throughout the previous studies regards the impact that transparency has on audiences. Perceived transparency has been seen to contribute to trust, which in exchange increases audience willingness to share accurate and meaningful personal data. This study supports this finding, showing that **VMV** who were given agency and control over their data identities were more willing to maintain their data identity's accuracy and to share personal data that they otherwise would have been reluctant to.

I have established that personal data is an increasingly important resource for any organisation, but particularly for the **UK's** arts and culture section who rely on personal data to ensure continued funding (Arts Council England, 2017; Mendoza, 2017; Selwood, 2002; Caldwell, 2002; O'Neill, 2019; Murphy, 2019). However, I have also established that data collection can be risky. Opaque and misleading practice such as those seen in the privacy policies of **S1** risk undermining visitor agency and reducing trust in the organisations (Passebois and Aurier, 2004; Srinath et al., 2021; Slavin et al., 2016; Libert, 2018). Loss of

trust was a common theme that had wide-reaching impact. However, museum staff in **S2** showed a lack of awareness of the attitudes of the museum audiences towards data collection including the potential impact declining trust is causing. The audiences demonstrated in the **S3** workshops that they not only have greater awareness of data injustice than staff expected, but also that they have the tools and ability to respond to perceived loss of trust in meaningful and impactful ways. Audiences talked about rewarding museums with high levels of trust with more interaction, and punishing low-trust organisations through reduced attendance and reduced engagement. Reduced engagement and attendance is subsequently reflected in data shared with funders, and can have monumental impact on future funding levels. As such, building and maintaining trust between organisation and audience becomes vital to the longevity of the cultural sector. Further, transparency of data practices is shown to be an area in which improvement can build trust, and stagnancy of practices will reduce it (Macnaghten et al., 2015; MacMillan et al., 2005; Passebois and Aurier, 2004; Tolmie and Crabtree, 2017).

Despite the discourses experienced and perpetuated by audiences surrounding personal data highlighting an awareness of data misuse and opaqueness, establishing what constitutes data misuse to audiences is difficult. Attitudes to data, consistent with the findings of the previous studies, were heavily contextual. Different kinds of organisations were afforded different assumptions and expectations regarding data collection and usage by participants. Specifically, museums were understood to collect little personal data for internal use and were expected (if not assumed) to use collected data in ways deemed by **VMV** participants to be in line with their own altruistic and ethical principles (Lourenço et al., 2020; Bhattacharjee et al., 2017; Bekkers and Wiepking, 2011; Passebois and Aurier, 2004). On the other end of the spectrum, for-profit companies were expected by **VMV** to harvest a vast amount of both seen and unseen data that they would inevitably, in the minds of the **VMV**, misuse and exploit. This behaviour was particularly associated with social media companies - who **VMV** were very conscious of misusing their data – even if participants did not understand what data was collected by them or how it might be misused (Isaak and Hanna, 2018; Brown, 2020; Taddei and Contena, 2013). In regards to other for-profit companies discussed, nefarious and vast levels of data harvesting were

often accepted by **VMV** as mundane and inevitable, with resisting such practices being viewed as not only bordering on impossible, but also pointless.

Whilst participants demonstrated awareness that data collection and data violence (Hoffmann, 2020) is happening, they generally did not understand the means through which data can be collected, and expressed surprise and distaste at some of the more intrusive practices that were discussed in interviews. One example that frequently engendered surprise and distaste was the Google 'dongle' described by museum staff in 5.3.3 combining data sets from multiple sources to track movement via Google. This was a particular source of discomfort when discussing how their personal data could be used to infer data about their friends, family, or peers (Tolmie and Crabtree, 2017). **VMV** showed a higher level of discomfort or even upset at the realisation that data was being harvested from and about people in their social circles than they did about data being collected from themselves. As highlighted as a potential concern, the element of surprise that came with this realisation for a number of **VMV** meant that they expressed more reticence to share certain data with the museum than they otherwise might have due to a perceived breach of trust (Passebois and Aurier, 2004; Tolmie and Crabtree, 2017; Srinath et al., 2021; Slavin et al., 2016; Libert, 2018). However, contrary to expectations set by the literature, this hypothetical reticence was not reflected in the behaviour of participants who did not exercise the opportunity given to alter the data they agreed to share. The reason for this is unclear, however several possible explanations can be offered. First, that the study is being conducted by a researcher from a well-known university. This has been seen to grant an additional layer of trust to the study that may not be granted to an app used in daily life (Darzentas et al., 2022; Benford et al., 2022). A second explanation may be that visitors were aware that the data collected for the study was not actually being shared with museums, and so they felt it unnecessary to alter the information shared. Another possibility is that the fatigue many people feel regarding their personal data (Vitale et al., 2020; Taylor, 2017; Hoffmann, 2020) prevented them from choosing to exert their choices. A combination of all of these options is likely, and highlights just how much more work will need to be done to tackle societal discourses before the general public become advocates of their own personal data.

The experience of seeing data collection processes happening in real time, as well as receiving explanations around how data would be used by the app and the museum made a

variable difference to **VMV** attitudes to personal data collection, although which group participants were assigned did not seem to affect it. Frankie, Alice, and Marvin expressed that there was no notable change in their opinions whatsoever – their trust that the app was being fully transparent was limited by previous experiences and their attitudes reflected that cynicism. However, for the rest of the participants, the transparency of collection and use was important to them and they were interested in exploring the agency granted them by the process, albeit to different degrees. For some, simply being given the information and options was enough for them to be willing to share all of their data with the app and museum. The increase of trust from the transparency combined with the altruistic motivations of most visitors to share data with not-for-profit organisations (Skatova et al., 2014) was enough to ensure that participants felt confident in sharing their data. However, most of the participants explained that they would be more selective with the data they shared when given the choice. Choosing to enact the agency and power given by the app, participants explained that they would withhold data that they felt was overly personal and which they did not understand or agree with the purpose of its collection. Examples matched the data that participants of **S3** also said they would like to have more control over, including certain demographic details and behavioural information for which they did not believe the benefits to the museum overcame the sensitivity or risk of that data. Despite this selectivity, however, participants also showed an increased willingness to actively ensure the accuracy of their personal data, either by keeping it up to date or by editing their **MuNa** profiles to ensure it accurately reflected their experiences. This is in slight contradiction to the findings of **S3** that showed that participants did not want the ability to change much of the data held about them. This finding indicates the possibility of heightened trust and agency increasing the willingness of visitors to actively use their increased power for mutual benefit.

Transparency is shown here to have the potential to increase the accuracy of data collected, as well as trust and therefore long-term engagement with audiences. However, the findings also raise an interesting conundrum about introducing transparent data collection practices to an already opaque system in which trust must be damaged by the reveal of existing practice before it can be rebuilt stronger. The findings suggested that for those visitors who find the concept of transparency enough to merit trust, data sharing will remain much

unchanged, albeit likely more accurate and curated by the visitor themselves. Alternatively, it can be surmised that for the minority of visitors whose cynicism and previous experiences have damaged their trust in all data collection practices, their behaviour will likely not change at all, although they too may build trust in the institutions' transparency over time. For the majority of visitors, however, there is some risk that they will be less willing in the aftermath to donate certain data when the process is made transparent, although the data they do share will likely be more accurate. Importantly, however, in the long term, as trust is rebuilt and forged stronger, these visitors will be willing to share more data again, provided the trust comes from establishing clearly and transparently how data is collected and why.

7.4.2 The Impact of Mutuality on Willingness to Donate Personal Data

The literature presented throughout this thesis on gifting shows that current data collection processes can be viewed as transactional gifting (Davies et al., 2010). This paradigm highlights the exchange of data as something given by the visitor 'without the expectation of direct compensation' (Davies et al., 2010: 414) but for which some intangible return can be expected. Examples of expected returns given by museum audiences in **S3** included access to newsletters or events, a stake in content or curation, or discount vouchers for gift shops or cafés. However, museum staff in the **S2** workshop made clear that such exchange is dependent on factors like organisational principles and resources. As such, whilst data practices are currently transactional, there is no guarantee that visitors will see the anticipated returns. Instead, I advocate for an overt shift to relational gifting (Davies et al., 2010) within the museum, whereby substantive reciprocity acknowledges and returns the value of data gifted by visitors. As such, establishing what the value of different data was became a central aim of the research.

When discussing the value of their data, **VMV** recognised that their data has value to multiple different stakeholders and that it can be used both for good and bad purposes (with bad being conceptualised primarily as being sold to third parties). However, **VMV** participants also understood data value as something that primarily benefited the organisation, often benefited other investors or stakeholders in the organisation, sometimes benefited society, and rarely benefited the individual. This hierarchy was also seen in attitudes from staff and audiences in **S2** and **S3**. Despite this, for the vast majority of **VMV**, societal good was the most important factor to them in whether or not they wanted

to share their data, aligning with the altruistic motivations suggested by (Skatova et al., 2014). There was a strong desire by **VMV** to see their data be used in ways they deemed beneficial to their peers, whether it was in making relevant content, making content more accessible, or the outreach impact of the organisation. This was in line with the findings of **S3** museum audiences who demonstrated a willingness to share certain high value data like (dis)ability and worldview if they could see societal benefits coming from it. The focus on societal benefit over individual benefit was presented by **VMV** as intrinsic to the process of data collection, with societal benefit being presented as almost a consolation prize – *if it doesn't help me, at least it might help someone else*. However, when the possibility of reciprocation was suggested to participants, **VMV** and **S3** participants responded extremely positively and with heightened enthusiasm. For example, as **MuNa** worked to re-empower **VMV**, groups A and B in particular become more vocal and more optimistic that not only could they receive inbuilt benefits to make their museum visits better, but that they could use the changes put in place to improve their own experience as well.

The power of museums was relatively well understood in parts by visitors. Two examples that came up frequently were the way that content is curated to be imbued with the opinions of the curators and the fact that the gift shop is located by the exit to encourage visitors to spend money. Interestingly, the knowledge that curation is subjective is in direct contradiction with the literature that suggests that visitors trust museum content to be objective and 'true' (Taborsky, 1990; Benson and Cremin, 2019). However, the findings of this study do not suggest that either are wrong. Instead, it seems that visitors internalise this contradiction that content can be both subjective and objective and experience the museum as if both were true. Once again, this ties back to the findings of **S3** that show that visitors have far more capacity to exert their own power during a visit to shape it to their own needs than the staff from **S2** might think. However, many of the ways that visitors experienced imbalanced power during their virtual visit and previous experiences was either hidden from them or so mundane that it was not commented on. Examples include limiting contextualising information available or museums scraping personal data from online. In response to imbalanced power relations, **VMV** often expressed small acts of everyday resistance, both deliberate and subconscious, that allowed the visitor to re-empower themselves in small but significant ways (Scott, 1985; Johansson and Vinthagen, 2016;

Vinthagen and Johansson, 2013). Similar to examples seen in **S3**, some examples given by **VMV** in this study included:

- Taking notes on certain concepts to research them further in their own time to form more nuanced opinions
- Avoiding the suggested routes given by museums
- Making fun of exhibits within social groups
- Taking their own picnic to museums to avoid spending additional money in onsite cafes.

As such, while **VMV** recognised the museum as the authority on their content, the visitor still works to make sense of the content in their own ways.

VMV were re-empowered by **MuNa** to take these small acts of resistance and embed some of them into their visiting experience as *part* of the museum, and not *in spite* of it. The personalised routes gave **VMV** a chance to prioritise their interests and ensure they were able to engage with the pieces most relevant to them, not removing it from the context of the curation of the exhibit, but enhancing it by enabling more meaningful engagement. By providing choices of multiple routes to choose from, including none, the visitor still has the ability to make a decision for themselves instead of having a route forced on them, working with the explicit needs of the visitor and not despite them. Further, when **VMV** were able to choose which pieces to engage with first, they had more energy to understand the pieces that resonated with them most and critically place it within the rest of the exhibit. Archiving was also a popular feature of **MuNa** that acted to provide meaningful returns for shared data. Whilst most participants found it to be interesting, archiving was particularly relevant for the participants who enjoyed revisiting certain pieces and conducting their own research. Providing a central place where all the pieces could be left in the context of that visit, and without being lost within the camera roll proved to be a popular element of the app and **VMV** explained that it made them more likely to revisit the content in the future and continue their own education. To use all of these different tools, **VMV** were more willing to share relevant information with the museum than they had been prior to the experience in order to ensure suggestions, tools, and content were relevant to them. Ranging from providing data about (dis)abilities or additional needs requirements or

information on the kinds of content they enjoyed or were interested in seeing – the vast majority were willing to provide *and* update their **MuNa** profiles to ensure accuracy.

Existing literature suggests that a primary motivation for wilful data exchange is the promise of it leading to the nebulous concept of ‘societal good’ (Skatova et al., 2014). The participants in this study also appeared to lend credence to this claim – unable to explain what specific social good they expected to come from it, but hoping for it all the same. However, when explored more deeply, it appears that the concept of *personal* gain from data exchange is not dismissed outright. Rather, it has come to be expected that personal gain from such an exchange is not an option, and that social gain should be the consolation prize. However, once equipped with tools to reclaim power and benefit from their engagement with museums in an individual, personalised way, **VMV** were more willing to share their data, keep it updated, and even share *more* data to make the personalisation elements more accurate. This is of benefit for not just the visitor, but also their wider communities, the museum themselves, and ultimately funding bodies.

7.4.3 Using Personal Data to Increase Accessibility and Inclusivity of Museums to Different Audiences

One of the greatest desires to emerge from the literature and the **S2** workshop with museum staff was to increase the numbers and the diversity of audiences accessing cultural organisations (Mendoza, 2017; Arts Council England, 2021b; Arts Council England, 2021a). Museum staff were keen advocates of increasing diversity as well as numbers of audiences, both in response to increased pressure from funders to do so, and for their own development and outreach. However, limited resources including infrastructure, time, and money means that these desires are often pushed to the side in favour of meeting necessary requirements (Birch et al., 2021; Fabian et al., 2017; Selwood, 2002). Further, increased accessibility and inclusivity was also something that museum audiences in **S3** reflected to be an important consideration for museums. This was both in terms of accessibility of the physical site to people with additional mental or physical barriers, and in terms of increasing accessibility of content to people from different backgrounds and with different life experiences. Both staff and audiences were keen to include technology in their visions for how museums could be made more accessible and inclusive, and were able to

envision futures where personal data was used to achieve these goals, which became central concepts used in the design of **MuNa**.

One of the key barriers to access and inclusivity that has been consistently highlighted throughout this thesis has been in exposing and overcoming hidden, mundane, and even overt power structures found within the museum visit experience. Analysing the ways that power emerged within this thesis, and particularly within this final study, demonstrates the complex, interweaving web of manipulations that constitute social structure (Kelemen and Rumens, 2008; English, 2010; Foucault, 2000). It also highlights how these webs often come together within the museum to create both opportunities and barriers. Examples drawn directly from the experience of the participants are in line with expectations set by the literature. For example, several **VMV** made note of the cost of museum visits such as travelling, entrance fees, cafés, gift shops, etc. **VMV** most likely to have named this as a barrier were ones with lower income jobs or who were retired (Falk, 2009; Falk, 1993; O'Neill, 2019). Profession or job is a traditional indicator of 'class', and those with better paying jobs typically have more affluence in money and time and so are more likely to attend museums. (Dis)ability is also related to class as those unable to work have less financial resources for recreation, and it may cost more in terms of physical and emotional resources to attend than an able-bodied, neurotypical person may have to expend (Coleman, 2018; Walters, 2009). Similarly, education levels were noted by a number of participants as acting as either a privilege in being more equipped to engage with certain kinds of content, or as a barrier to understanding hidden or implied knowledge (Falk, 2009; O'Neill, 2019; Gross and Pitts, 2015; Gross and Pitts, 2016). Vitality, education was the most commonly acknowledged responsibility for museums by **VMV** along with other responsibilities of preservation and platforming. Further, **VMV** definitions of 'education' extended beyond the curated content of the museum and into broader social education of contemporary topics and wellbeing (Dodd and Sandell, 2001; Bourdieu, 1973; Prentice et al., 1998; Bardzell, 2010; Mendoza, 2017).

Ethnicity and sexuality too were noted as potential barriers, both of which tie back to issues highlighted with class and education, as well as into social expectation (Mason and McCarthy, 2006; Coleman, 2018). Sheila's experience of **MuNa** as incompatible with her family and work commitments is also representative of a potential structural barrier

experienced as gender. Gender roles regarding technology often prevent women or gender minorities from fully engaging with technologies due to less opportunity to learn how to use technology and social stigma assigning technology as a 'masculine' pastime (Bardzell, 2010; Bardzell and Bardzell, 2016; Fox et al., 2017). Further, as museum visits are predominantly social affairs (Falk, 2009; Goulding, 2000; Fosh et al., 2016), women and gender minorities are often assigned pastoral care to attend to the rest of the group (Falk and Dierking, 2016; Falk, 2009) and thus might be unable to grant attention to external distractions. Finally, socioeconomic barriers to engaging such as lack of smart phones, lack of education, and lack of spare time to engage with pre- and post- visit material is also an important potential barrier, although not one highlighted by participants. As such, it was shown to be an important consideration for **VMV** that any technological changes to museums must be optional, and visitors who choose not to (or cannot) engage with such technologies must not be penalised if they wish to engage with the museum in a more traditional way. Presenting these barriers here is an important factor in understanding the daily experiences of audiences. However, it is important to note that these barriers occur in response to structural inequalities within the museum and wider society that underlie, perpetuate, and uphold inequality. Unpicking the complexities of such interrelated powers are beyond the scope of this thesis, but highlighting and overcoming some of the barriers explicated here is not. Rather, revealing how structural inequality is experienced by audiences gives opportunities to reveal where power is most imbalanced and presents the opportunities needed to empower audiences, and pressure institutions, to change narratives and infrastructure that may be preventing fair and equitable access.

Summarising the core issues created by the power structures highlighted above shows multiple, structural barriers to accessing museums and their content. One powerful example of how structural inequality can prevent access came from the experience of Marvin, who self-described himself as a person of colour, and described museums as 'stuffy' and talked about feeling like he 'didn't want to be there [in museums]'. Expanding the means that visitors have to engage with and understand the museum is a core aim for many cultural organisations (Mendoza, 2017; Simon, 2010; Vermeeren and Calvi, 2019; Eklund, 2020; Murphy, 2019) but is often limited by the physical constraints of museums. Exploring the physicality of museums also highlights other structural imbalances that can prevent

engagement for a great number of potential audiences relating to embodiment. This is particularly notable of audiences who belong to a minoritised or marginalised demographic, who may not, for various reasons, be able to physically or emotionally access physical sites. Much work has already been done that begins to tackle these limitations, using technologies to make museums and cultural sites more accessible and interactive through virtual or remote engagement or augmenting the physical site (Falconer, 2017; Reeves et al., 2018; Spence et al., 2020; Darzentas et al., 2022; Franz et al., 2019). However, often these interventions do not (or cannot) address the structural barriers that prevent engagement, instead risking incidentally perpetuating inaccessibility by removing visitors from the space entirely or creating new barriers to engagement. **MuNa** was explicitly designed with these embodied barriers in mind and inspired by the work that came before, to instead work to complement the existing, physical capabilities of museums whilst being mindful of the barriers to access that might prevent engagement. For this purpose, **MuNa** provided information about the content of exhibits prior to arrival, live museum information such as business of exhibits and specific pieces of interest, and personalised routes that could be tailored around physical or neurological limitations surrounding fatigue and overstimulation. This was experienced by **VMV** participants in expected and unexpected ways. For instance, Tricia found personalised routes to be helpful in reducing the anxiety of visiting museums as she finds British museum layouts confusing as someone born and raised abroad. Sheila found live museum information to be helpful in deciding which pieces to engage with in more depth as she is often visiting with family and has limited time to explore. More unexpectedly, Marvin's desire to 'draw a penis' with his trajectory around the museum also showed how the physical and digital can interact to make an experience meaningful to the individual. As such, **MuNa** is shown to be capable of enhancing the physicality of the museum visiting experience and reduce barriers such as anxiety, overwhelm, or 'stuffiness'.

Augmenting the physical space of museums to respond to structural barriers was an important target for **MuNa**. However, so too was finding ways to augment the intangible parts of a museum visit to increase accessibility and inclusivity; specifically around empowering audiences to engage more meaningfully with content. This has been a long standing goal of museums, particularly with the rise of New Museology principles (Simon, 2010; Stam, 1993), and one for which many museums have turned to technological

interference already (Howes, 2015; Recupero et al., 2019; Eklund, 2020; Murphy, 2019). Technologies are already widely accepted by visitors to offer engaging, exciting, and important experiences within museum visits (Murphy, 2019; Spors et al., 2020; Eklund, 2020; Recupero et al., 2019; Zollo et al., 2021; Darzentas et al., 2022; Spence et al., 2020). The increasing use of these technologies can be described as part of the appeal that has led to younger generations becoming more frequent visitors to museums, even without the influence of schools or families (Zollo et al., 2021; Eason and Leask, 2020). Importantly, technologies were also widely anticipated by the staff, audiences, and visitors who participated in this research to increase the accessibility and inclusivity of the museum and reduce the barriers highlighted. For instance, where visitors like Marvin can find museums unwelcoming, technology may empower them to reclaim their experience of the visit and find ways to engage with the museum beyond ‘keep[ing] myself to myself’ (Marvin). Examples of how this could be achieved with the use of personal data were offered by **S3** audiences and included personal archives, tailored media recommendations, and visual feedback of data. There is a common theme between many of the suggestions made which is of increased contextualisation.

Contextualising museum content was very important to **S3** audiences and **VMV** as it enabled them to better understand what they were seeing and to integrate gained knowledge into their daily lives. Part of this contextualisation can, in some museums, come from an ‘official’ narrative provided by the organisation, which is often trusted by visitors to be objective and unbiased truth (Benson and Cremin, 2019; Taborsky, 1990). However, limitations of physical space means that details about exhibits cannot always be shared on site. This can present an insurmountable barrier to those without the social, cognitive, or educational background to understand assumed or implied knowledge (Gross and Pitts, 2015; Gross and Pitts, 2016; Walters, 2009). Further, contextualisation also comes from how knowledge fits (or contradicts) the visitor’s existing knowledge and experience. As such, many visitors also create their own interpretation of the content, making use of the museum interpretation, but also basing interpretations on their own experiences, personalities, knowledge, and situations (Given, 2008b; Kelemen and Rumens, 2008; Foucault, 1978). Further still, the colonial legacies of **UK** museums raise some arguments that ‘official’ narratives can be detrimental to the content, the cultures represented, and the communities that absorb

them (Gregory, 2004; Vergo, 1997; Stam, 1993; Murphy, 2019; Taborsky, 1990; Tolia-Kelly, 2016; Westwater, 2021; Aitchison, 2000). **MuNa**'s efforts towards enhancing the visitor's ability to contextualise the content in different ways – with 'official' interpretations, alternative interpretations, and created space for personal reflection – was explained by **VMV** to dramatically further their ability to engage with the content meaningfully. This enhancement is, once again, an established and important goal of contemporary museums and the wider cultural landscape as a way of making *active participants* of visitors (Passebois and Aurier, 2004; Mendoza, 2017; Falk and Needham, 2011; Simon, 2010).

As well as finding ways to disrupt power structures to increase accessibility and inclusivity, this study also sought to highlight how existing technologies are, or are not, utilised by audiences and what this might mean for current and future museums. Despite the optimism of **VMV** about the capabilities of technology to make museums and museum content more accessible and inclusive, very few of them sought out ways to use existing technology to do so. None of the **VMV** had previously tried to use technologies or online resources to contextualise their own visits or discover physical accessibility information, instead relying on the museum to do so (or not) onsite. While this presented a potential concern that **VMV** would be disinterested in using **MuNa** to find this information, the vast majority of participants chose to engage with at least one feature of the app in depth, and all but Sheila expressed a desire to use the app again. For instance, engaging with multimedia resource lists prior to the visit was a popular element of **MuNa** that 67% of **VMV** opted to use. Those that used it described an increased ability to draw parallels between the knowledge provided and the content of their visit to a higher degree than they self-reported they would otherwise. 75% of **VMV** used personalised routes to navigate the museum, with benefits highlighted by participants including avoiding busier areas and prioritising interesting content. However, the reticence of some participants to use features of the app also highlights an important risk and consideration in designing technologies for museums. That is, there is existing fatigue within the general population regarding overstimulation, not wanting to download apps, and balancing the escapism afforded by museums with the realities of the outside world (Macnaghten et al., 2015; Sicart and Shklovski, 2020; Dowthwaite et al., 2021; Crabtree et al., 2016). Combined with the structural barriers to access highlighted, there is a high risk that technology might not be adopted successfully if

its value is not clear from the first interaction (Macnaghten et al., 2015). However, the overwhelming response from participants suggested that having a centralised place in which content was made more easily accessible was enough for all bar one **VMV** to overcome, or at the very least navigate around, most of these additional barriers. This was attributed by participants to the flexibility of the **MuNa** app to empower them to make sense of content in personalised and unique ways, and not forcing them to use certain parts of the app in pre-defined ways.

7.4.4 Reflections on the MuNa App and Future Considerations

Evaluating the success and failures of **MuNa** is vital to offer implementable guidance as to how mutually beneficial data exchange can, and indeed should, become an integrated part of museum experiences.

MuNa was tested by **VMV** in a virtual museum visit. As described in 7.3.1, participants were mostly male, in their 20s, and students. Important to note, is that the study was not advertised through University of Nottingham channels, and participants represented a broad number of academic institutions both in and outside of Nottingham. As such, it can be seen that while these demographics are not particularly representative of typical museum visitors, they are representative of demographics likely to want to engage with technologically driven museum experiences (Zollo et al., 2021; Easson and Leask, 2020), as advertised for the study. For all of the participants, however, virtually visiting the museum was a novelty and its reception was mixed. The majority of **VMV** were positive about the idea of a virtual gallery as a temporary placeholder while they could not visit physical museums due to COVID-19, however several were less optimistic about its usefulness long-term. All of the participants remarked on 'something' being missing from the virtual museum, be that being able to physically interact with the content on display, the atmosphere of the museum, the presence of other people, or something else less definable. However, for **VMV** with additional accessibility needs (or those who visited with people with additional needs), the virtual gallery offered increased access to certain parts that may not have been accessible otherwise and was lauded for this capability. For **VMV** then, it becomes apparent that it is less desirable for the virtual museum to simply exist as a replacement to the physical, but rather it should function as a *different* way to access content. Visitors wanted new, novel, interactive ways to engage with the content that

would not be possible in the physical space, with the opposite being true of wanting physical spaces to remain important for experiencing other parts of the exhibit.

VMV were introduced to **MuNa** as a tool that would use their personal data to benefit themselves and museums in different ways. Technologies used and described to **VMV** were not novel, as it primarily relied on the **VMV** completing a personal profile – something that most people have experienced before – with some tracking and monitoring capabilities that emerged through the prior studies as ‘mundane’ and ‘accepted’. The novelty of **MuNa** primarily came from its focus on centring transparency and fostering agency of users to control their own personal data. This was received well by **VMV**, who generally described an increased willingness to curate their own data and to share a broader array of personal data than they would otherwise. However, whilst the analysis shows a lot of potential for **MuNa** to increase transparency and therefore trust, it also uncovers a deep and intrusive discourse of mistrust in existing technologies and personal data collection that cannot be easily overcome. Indeed, it shows that while **MuNa** had an overall positive impact on public understanding of personal data collection, this alone was not always enough to overcome the prejudice and fear of visitors. This was demonstrated to differing degrees by **VMV**. For an important minority of **VMV**, the app simply showed that more transparent and mutually beneficial practices were possible, although they did not believe that the transparency was absolute and showed cynicism that it would be applied long-term. However, for most, in line with the results of the gifting literature explored in 2.4.5 (Benford et al., 2022; Darzentas et al., 2022; Spence et al., 2021; Spence et al., 2020), the experience demonstrated that opening up questions and discussion around transparency and uses of personal data increased confidence in visitor understanding of personal data beyond even the doors of the gallery and into wider society.

For the **VMV** who expressed scepticism at the honesty of **MuNa** and the current practices of museums, the experience of using the app did not decrease their levels of trust in the museum. Rather, they expressed a willingness to grant more trust in a future where the app and the museum worked together to prove their transparency and honesty. Indeed, for the majority of visitors it emerged that their trust in the museum remained roughly the same. For group C, their experience around using **MuNa** did not include the transparency of personal data collection and their levels of trust in the museum and the apps data collection

remained static, although their enjoyment with the app did appear to increase their overall trust in the technology. However, once they learned about the data collection in their final interview, many showed a dramatic decrease in trust of app *and* museum as they expressed distaste or even upset at the revelation. This concretised a fear that was present across all groups – that their data would be used in a way that the **VMV** deemed to be inappropriate or unfair. As museums do start with a higher level of trust than other organisations might (Bekkers and Wiepking, 2011; Lourenço et al., 2020; Bhattacharjee et al., 2017), so too they have farther to fall when that trust is breached. Many participants made it clear that with transparency came a higher level of expectation to use data ‘correctly’ and if that expectation is not met, then they would be more likely to choose not to engage with the organisation again than they would for an organisation they did not trust as much to begin with. Despite this, groups A and B both primarily expressed increased levels of trust in the technology once receiving the explanations of what data was collected, why, and how. Interestingly, the increase of trust in the technology did not automatically mean that **VMV** were happy to share all of their data. Visitors were keen to utilise their options of what data to share or not and half of participants given the option to limit their data, chose to do so. However, all **VMV** across groups A and B explained that they were more willing to share more in depth and qualitative data than they otherwise would have been which can be attributed to increased levels of trust in the technology and consistent levels of trust in the museum.

To summarise these reflections, and in order to ensure that **MuNa** was not only effective in reaching its goals during the study but also to evaluate its potential role in the future of museums, we turn to the work of (Macnaghten et al., 2015). (Macnaghten et al., 2015) highlight five key concerns of the general public that technologies should consider in their design if they want to be adopted:

- *Purpose of emerging technology* - For **MuNa**, the purpose of the technology is mutual empowerment of stakeholders. Using the findings from across the thesis, **MuNa** aimed to provide a technological assistant to enhance the museum and the museum visit experience with the goals, aims, needs, and barriers of stakeholders deeply embedded within its design. As such, the purpose of the app is transparent and timely, and **VMV** demonstrated high levels of understanding regarding the

purpose of the app. Participants also showed some awareness of the purposes behind data collection technologies in general, although this awareness was not always grounded in reality. However, this misunderstanding of personal data is, itself, part of the purpose of the specific technology utilised here.

- *Trustworthiness of those involved* - Regarding trustworthiness, it has become clear throughout the thesis that trust is complicated and fluid. Museums typically have a higher level of trust than for-profit organisations (Bekkers and Wiepking, 2011; Lourenço et al., 2020; Bhattacharjee et al., 2017), although this competes with the low levels of trust the data collection technologies have (Tolmie and Crabtree, 2017; Dowthwaite et al., 2021; Nissen et al., 2019). It has been demonstrated that whilst potentially risky to short-term trust, **MuNa** has the capacity to increase trust in museums and their data practices.
- *Inclusion and agency of the public* - In terms of inclusion and agency, these concerns are not only embedded in the app, but are central to its deployment. The public have not only been a vital part of its development, but the app itself also centres on re-empowering visitors to engage with museums more meaningfully. For instance, museum visitors have always found ways to make museum content more relevant and accessible to them and their unique situations (Johansson and Vinthagen, 2016; Vinthagen and Johansson, 2013; Lynch, 2013; Lynch, 2011; O'Neill, 2019; Falk, 2009). **MuNa** was received by **VMV** as a tool to enhance their ability to continue to do this. Whether it provided a way for the visitor to store and revisit content for their own research in their own time, deeper layers of information about certain exhibits, or contextualising multimedia resources about exhibits or routes that prioritised the wellbeing of the visitor, all **VMV** found the museum to be more accessible in one way or another through the use of the app. For all of the participants, this increased accessibility and inclusivity helped them to better understand the museum content and apply it to their own lives, and for 11 of the 12 provided a tool that they would explicitly use again.
- *Speed and direction of innovation* - The speed and direction of innovation is less relevant to **MuNa** as data collection technologies (whilst still rapidly developing) are already accepted as mundane and every day, rendering their development speed fairly moot in terms of impact on the research.

- *Equity* - Finally, equity was also a core consideration of the design, and once again has been addressed through the collaborative identification of barriers and opportunities that museums can offer to their communities. It has been demonstrated that equity, equality, and justice are important considerations to all of the stakeholders identified throughout this process, and I hope that through the processes of re-empowerment afforded by **MuNa**, that equitable access to museums can become more mainstream. Further still, I hope that this thesis provides justification for building equity into considerations towards data collection technologies more generally – both from the side of data collectors *and* data subjects.

7.4.5 Overcoming Limitations

The core limitation of the study arose from the need to conduct app testing in a virtual museum due to COVID-19. Necessary changes to the intended functionality of the app are detailed in 7.2.2. Additionally, the anticipated focus on the physicality of the museum was no longer possible. Instead, using post-structural feminism methodologies as explored in 3.2, findings surrounding space came from omission and gaps in the texts; from the *absence* of physical space, rather than its presence.

7.5 Contributions to Conceptual Framework and Summary

This study presented the development, deployment, and evaluation of a prototype app that signifies the culmination of knowledge gained throughout the PhD process. The goals of this study were to address remaining or identified gaps in the research regarding the aims of the thesis presented in 1.2. A reflexive thematic analysis was conducted on data collected from participants during a virtual museum visit to highlight how transparency, mutuality, and accessibility impact the museum visit experience. The findings are summarised here and explicit contributions to the conceptual framework are demonstrated in Figure 17.

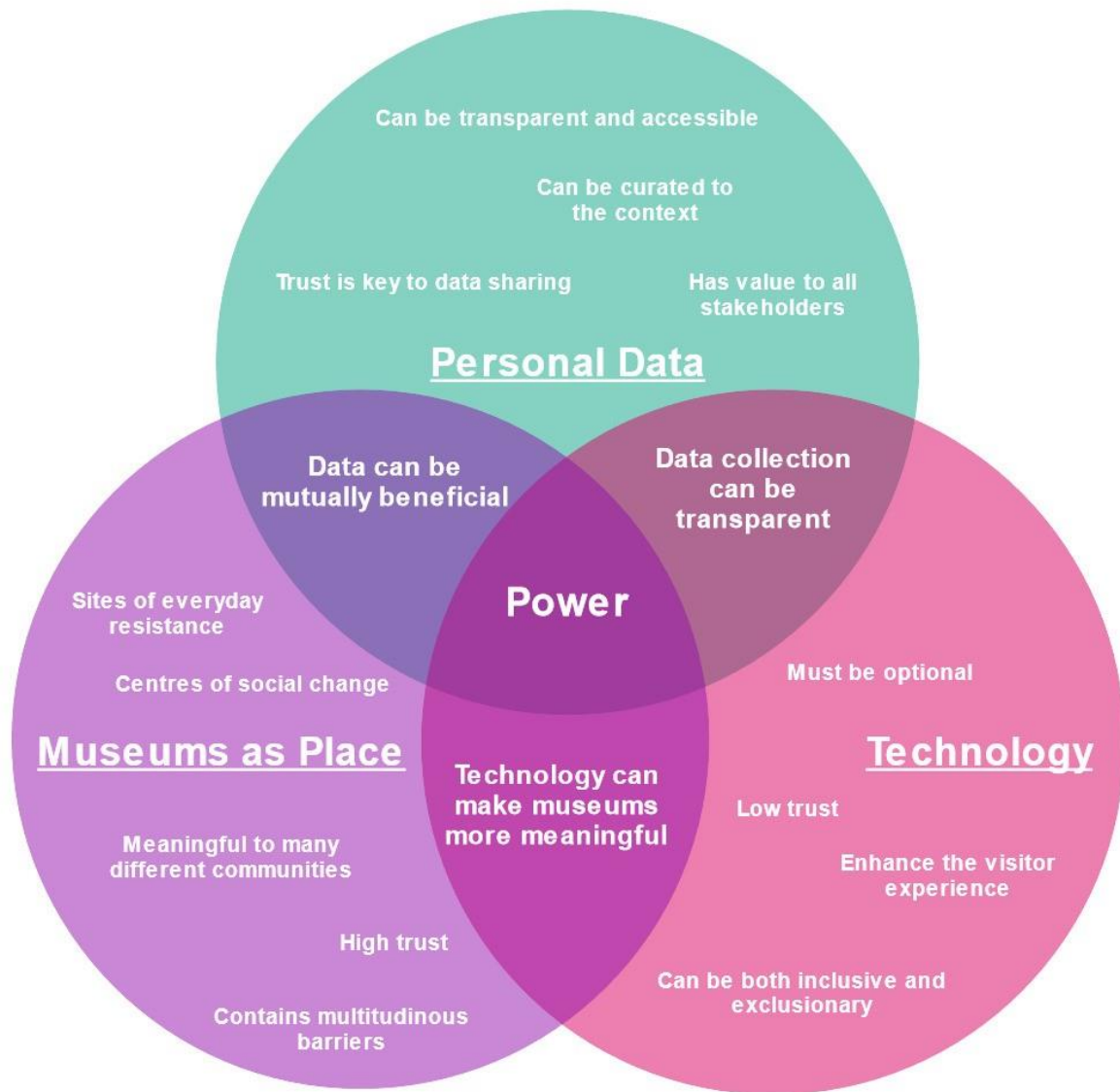


Figure 17. Venn Diagram of Conceptual Framework Contributions from Study Four

MuNa was created with overt focus on input from numerous museums, museum staff, audiences, visitors, academics, researchers, and practitioners. Influenced by the needs, priorities, barriers, and expertise of all of these voices, I developed an app prototype that weighted the input of different stakeholders as equally important. **MuNa** offers museum visitors multiple avenues to engage with arts and culture in more meaningful, personalised ways than standard museum visits, whilst also generating usable personal data for museums. The previous studies highlighted several considerations from different stakeholders that were built into the app including the importance of transparency to generating trust, the potential benefits from providing mutual value in exchange for data,

and how personal data can help identify and overcome structural and social barriers to engagement.

MuNa demonstrated an example of how personal data can be collected and used transparently as a relational gift, and showed that the majority of participants found this transparency to increase their trust in the museum. As a result of this heightened trust, participants expressed that they would enact more agency in their roles as data subjects, both in terms of choosing what they would share, but vitally that they would also ensure their shared data was more accurate and reliable. **MuNa** also showed that while technology has a low trust level amongst the general public, museum audiences still expect technology to be part of their museum visit experience, and their trust in the museum generally overrides their fear of technology. This presented in a number of ways, most notably that participants would overwhelmingly be interested in using a new technology like **MuNa** as part of their visit and provided they understood how it would empower them and others who might otherwise struggle to access content. However, they also expressed an awareness and concern towards what additional barriers the technology might raise for some visitors. Finally, **MuNa** highlighted that museum visitors already use the museum space in ways specific to meeting their own goals and needs. Often, these acts present as everyday acts of resistance that deliberately 'misuse' resources in inoffensive and mundane ways, but which make all the difference to the visitor. Participants expressed that the functionality of **MuNa** made these acts easier, and as such made it easier to engage with the museum in more meaningful and impactful ways.



Synopsis

8.0 Conclusions, Recommendations, and Future Research

Throughout this research, I have demonstrated how an overt focus on *power* in the museum can highlight ways to create meaningful relationships between museums and audiences. Through the application of a novel conceptual framework combining *museums as place*, *technology as mediator*, and *relational personal data*, I have demonstrated that personal data-driven technologies aimed at re-empowering audiences can enhance trust, enable meaning-making, and provide vital resources to all museum stakeholders in long-term and wide-reaching ways. This chapter first presents a summary of the empirical research done. Subsequently, the application of the framework is revisited, and key conclusions are drawn out. Building on these conclusions, I lay out the theoretical contributions and practical recommendations of the thesis, before providing final critical reflections and discussing future research opportunities.

8.1 Summary of Empirical Research

The questions I presented at the beginning of this thesis were:

Q1. How are discourses and practices surrounding personal data negotiated, defined, perpetuated, and resisted in museums?

Q2. What is the value of personal data to museums and audiences?

Q3. Can mutually beneficial and transparent data exchange foster meaningful, long-term relationships between museums and audiences?

Through a sequential series of empirical research studies, these questions have been explored in a reflexive and iterative way. **Study one** (S1) presented the groundwork for these explorations through a content analysis of **UK** art museum privacy policies. The content analysis highlighted trends in what kinds of data are typically collected from audiences that were in line with expectations set by the literature, showing a prioritisation of quantitative demographic information and ‘technical data’ scraped from online engagement. It also showed a trend of sharing audience data with undefined ‘third parties’ who are permitted to collect, store, and analyse the data given to them. These privacy policies were of variable quality, but followed typical standards in their use of ambiguous

and vague language, and in being intellectually (and in some occasions physically) inaccessible to audiences.

In order to validate the findings of study one and to explore them further in context, **study two (S2)** turned to museum staff for a workshop focussed on understanding the past, present, and future uses of personal data in the museum. The workshop showed the importance of personal data to museums, both in terms of internal development, but primarily for external funding requirements. However, museum staff went on to explain that they had to prioritise the collection of quantitative demographic data over qualitative behavioural data, despite much discussion on the value of qualitative data to the organisations. Museum staff were keen to discuss the barriers they face that prevent them from collecting qualitative behavioural data, and demonstrated that limited resources for collection and analysis were most often committed to meeting funder requirements and adapting to regulatory changes such as the **General Data Protection Regulation**.

Once the value of personal data to museums had been contextualised, **study three (S3)** turned to museums audiences to establish what value they placed on their own personal data. Specifically, I focussed on seeking to understand the value of the qualitative behavioural data that museums coveted. Audiences completed a number of structured activities to uncover this value and to share broader audience attitudes to museums and personal data. The study showed that audiences place a high level of trust in museums that is capable of overcoming mistrust and fear surrounding the collection and use of personal data. However, the study also uncovered attitudes established in the literature that show fatigue and apathy regarding personal data, with audiences expressing that data exploitation is inevitable and out of their control. Despite this, audiences also showed optimism that these attitudes could be changed with transparent and mutually beneficial practices. When establishing what these practices might look like, audiences raised examples of everyday acts of resistance that they conduct within the museum site to make their visits more meaningful. They went on to suggest a number of ways that museums could use their personal data to enable these acts, as well as to enable new behaviours and ways of engaging with the museum that would improve the museum visit experience. Contrary to expectations set by the literature, audiences showed that their willingness to

share data was more strongly correlated with existing social discourses and potential for reward, than with the value they assigned to their data.

Having established what data is desirable to museums and what expectations and hopes audiences have regarding the use of that data, **study four** (S4) showed the development of a technological intervention that could meet these complex and sometimes contradictory goals. As such, I partnered with a colleague to write a design fiction of a future museum visit built exclusively around the results collected. The final study invited participants to use a technology probe based on this fictional technology, an app called **MuNa**, during a visit to a virtual museum exhibition. **MuNa** was described as a companion app and intermediary application that offered a number of features to visitors that would enhance their visit experience, for example tailored media, personalised routes, contextualising information, and a unique archive space. The app gave access to these features through the creation of a personal profile, which collected qualitative behavioural data including exhibits attended, behaviour in the gallery, and content preferences that updated iteratively from visit to visit. Vitality, **MuNa** offered simple explanations of each data point collected including why it was collected and how it would be used by the app and the museum. The majority of users were given complete control over which data they were willing to allow the app to collect and which data they were willing to be shared with the host museum. Further, all visitors could choose to ignore or utilise each available function, leading to each individual visitor using the app in different ways depending on their own needs and goals. Feedback on the app showed an overwhelmingly positive reaction that overtly contributed towards increasing trust in museums as a result of improved engagement and transparency. Visitors were more willing to share accurate personal data with museums when they could understand why it was being collected, and when they received something in exchange for their data gifts. Beyond improving relationships between museum and audiences, feedback also highlighted renewed engagement with personal data including optimism regarding the agency of the data subject and awareness of the value of personal data in other varied contexts. Vitality, feedback on **MuNa** also suggested positivity regarding ways the apps could increase accessibility and inclusivity of museums to minoritised or marginalised groups through its focus on contextualisation, personalisation, and enabling important acts of everyday resistance.

8.2 Utilising the Framework

The framework applied throughout this thesis allowed us to explore three key elements affecting contemporary personal data collection within the given context and examine the underlying power structures that shape it. The four core tenets of the framework (including power) were established early in the research process, and subsequently the framework was consistently applied throughout the empirical research. An important part of generating the framework came from iterating it, as co-creative practices brought in perspectives from different stakeholders. In doing so, it became possible to highlight contradictions, omissions, and assumptions that needed to be tackled to generate meaningful change.

Throughout this thesis, at the end of each empirical chapter, I provided a Venn diagram showcasing how the findings of each study have generated knowledge within the framework, with each iteration of the diagram building on the previous to create a holistic overview of each element from different stakeholder perspectives. Here, I provide conclusions and recommendations drawn from the utilisation of the framework.

8.2.1 Museums as Place

Museums as place is the element of the framework that deeply embeds the findings within its context. In S1, the findings of the content analysis on museum privacy policies highlighted that museum spaces are complex because of their hybridity, where they sit in broader socio-political contexts, and their affiliations. The findings also demonstrated that museums prioritise contact data and technical data in their collection processes as a result of these other factors. S2 built on these findings, expanding our understanding of *museums as place* by drawing in the perspectives of museum staff, who highlighted how limited resources, need to respond to legislative and funder requirements, and diversity of audiences impact how museums operate and perceive themselves. Here, an understanding of museums starts to emerge as one with complex roles, but limited capacity to serve those roles. S3 drew in the perspectives of museum audiences to examine the further factors that shaped *museums as place*, re-affirming the importance of museums across diverse communities as a place for community, education, identity formation, meaning-making, and resistance. Applying the framework here showed that there is much overlap in what constitutes *museums as place* to different stakeholders, an argument that was further strengthened in S4 by findings that showcased successful use of the museum to achieve

these goals by visitors, both with and without the input of MuNa. By investigating *museums as place*, the findings from the research are deeply embedded in the museum setting. As such, it becomes clear that for all the affordances and opportunities purported and offered by museums, the key limitation to change was lack of resources including time, money, and expertise. As such, attempts to affect the museum environment must be low cost, sustainable, and require little input from museum staff.

8.2.2 Technology as Mediator

Technology as mediator is the element of the framework that showcases how technology is, and can be, utilised in the given context to achieve the goals identified in *museums as place*. S1 used the privacy policy content analysis and literature from the literature review to determine how technology is utilised and presented to audiences, by museums. It showed that technology is fast paced and suffers from low trust, low accessibility, and ambiguity of regulation in its use. When combined with the understanding of *museums as place* generated in S1, this showed that technology evolves much faster than museums are able to, enhancing risks surrounding trust, accessibility and inclusivity, and regulation as museums struggle to keep up. These findings were validated in S2 by museum staff who correlated these findings with their own experiences, as well as highlighting barriers to technology including low levels of available expertise and limited financial resources to combat the highlighted problems. Despite this, museum staff were adamant that with further resources and time, technology would become an increasingly important asset in evolving museums and maintaining relevancy. Turning to museum audiences in S3, *technology as mediator* proved to be incredibly important in enhancing visitor experiences. Similarly to the findings of S2, technology was shown to offer both opportunities and risks, with museum audiences demonstrating low levels of trust in technology, but high levels of expectation that it be embedded in the museum space, and would positively contribute to their overall experience. Subsequently, S4 introduced a new mediating technology, MuNa, to visitors, confirming the sum of findings so far. Namely, findings from S4 demonstrated low levels of trust in technology, but high expectations that the technology would function well and deliver an enhanced visiting experience. As such, *technology as mediator* applied to the context of this research showcases that technology is an expected part of the museum visit, albeit one that must be optional to engage with. Indeed, all stakeholders involved in

the evaluation of *technology as mediator* demonstrated that technology is increasingly important in facilitating meaningful engagement between audiences, museums, and content, although it still has to work to prove trustworthiness before full social acceptance can be achieved.

8.2.3 Relational Personal Data

Relational personal data is the final element of the framework to be explored, and aims to highlight attitudes, affordances, and barriers surrounding the increasing use of personal data in everyday life. Using the findings from S1, personal data was shown to be presented in ways that are complicated and ambiguous, using language that makes engaging with personal data difficult, as well as using misleading practices such as omission and enforced consent to prevent true engagement. When combining these findings with those of *museums as place*, it becomes apparent that museums follow typical practices in privacy policies found in broader organisations, making personal data hidden, opaque, and misleading, potentially due to limited time and resources. S2 brought in museum staff perspectives to contextualise these findings, showcasing that personal data collection is indeed complicated and ambiguous because of a combination of lack of expertise and resources to better tackle personal data collection and use. Despite this, S2 also highlighted how important personal data is to museums for both internal use and for meeting funder requirements. In *museum as place*, personal data was used almost exclusively for the benefit of the museums, with little application directly benefiting the audiences. Further still, in combining this with the findings regarding *technology as mediator*, museum staff showed an awareness of the ramifications of misusing audience personal data, although little knowledge or ability to reduce such risks. Museum audiences in S3 also demonstrated some awareness of this dichotomy, proving knowledge of both the value of personal data to museums and potential data misuse/violence, however also expressed deep-seated apathy to combating it, revealing deeply problematic assumptions that personal data is too complex to engage with and that data exploitation is inevitable. As part of these unpacking these assumptions, it also became clear that *value* of personal data is not inherently tied to willingness to share it. Rather, it emerged that *relational value* of personal data was more important, in that if the audience could understand how a piece of data was collected and why, including any benefits the audience member might perceive, they would be more

willing to share it. This was a particularly important finding when comparing *relational personal data* and *museums as place*, as these attitudes were deeply embedded in the affordances ascribed to *museums as place* regarding altruism, trust, and meaning making within the museum. However, it also highlighted the complicated relationship between *relational personal data* and *technology as mediator* given how inaccessible and obtuse personal data collection and use was to museum audiences. Finally, S4 presented findings on the reception of truly *relational personal data* for museum visitors, presenting evidence that transparent, accessible personal data curation can be instigated in ways that improve trust, provide value to all stakeholders involved, and importantly can be curated to meet the needs and goals established within the context of the *museum as place*. This final study draws together all of the findings from the framework, presented through the lens of power, and cognisant of the voices of different stakeholders.

Through the consistent and rigorous application of this framework to each study, I have demonstrated how knowledge has been sought, analysed, and applied to create an ethical, mutually beneficial mode of data exchange that empowers data subjects, without disempowering the data gatherer. *Museums as place* provided contextualisation of the research that deeply embedded the process in the reality of museums, taking into account their goals, purposes, affordances, and barriers from a range of perspectives. Understanding *technology as mediator* allowed for research that centred technology at the heart of it, but which did so in ways also cognisant of the affordances and barriers to and of technology, again from a range of perspectives. Finally, *relational personal data* allowed for the critical examination of current personal data collection practices to understand questions regarding how data is collected, why, what is done with it, what different stakeholder understandings and perceptions are of each of these questions, and how misalignments in the answers can be better targeted to create a form of data collection that is, based on existing literature and the results of the empirical research, more ethical, transparent, and mutually beneficial in long-lasting and wide-reaching ways.

8.3 Theoretical Contributions and Practical Recommendations

This thesis makes a number of key contributions to the academic corpus of the three domains pulled together to underpin this research; Human Computer Interaction, Human Geography, and New Museology. Building on existing knowledge, the research presented

here offers original insights into museum audience priorities and behaviours, into the expectations and barriers placed on museums, and into discourses surrounding personal data. Vitality, this knowledge is generated *collaboratively*, working with museum staff and museum audiences to understand the museum visiting experience holistically. This novel perspective has been shown to dissect a number of assumptions made within the literature, and to offer alternative narratives to explain attitudes and behaviours of museums and audiences alike. These narratives also critically examine assumptions and accepted practices surrounding technology and personal data in the museum and beyond. Key amongst these assumptions is that education alone will be enough to enable data subjects to take control of their own data. However, discourses surrounding data exploitation, violence, and inevitability are too deeply ingrained in the existing moral order to be overcome with just one approach. Instead, the research shows and advocates for a far more tangible approach to empowerment in which users are given tacit examples of alternatives to current data practices and viable alternatives to passive acceptance.

As part of its contribution to the academic corpus, this research is conducted using a novel framework that combines *museums as place*, *technology as mediator*, and *relational personal data* through a lens of power. This framework provided a rigorous means of exploring the contexts, tools, and barriers to evolving approaches to personal data within the museum cognisant of the unique barriers and affordances present. This framework could be adapted to be used to other contexts within which personal data seeks to be utilised in ethical and transparent ways. By replacing 'museums' for another context, provided it is understood through its sense of place, the framework could be re-utilised by other researchers to explore how place, technology, and data are currently, and could potentially, be utilised in domains far removed from museums and galleries.

The thesis also makes use of a novel method developed for this research project – that of data-informed design fiction. The method builds on established principles of design fiction, enriching the approach through the integration of a rich and diverse dataset. It is my hope to continue to iterate and evolve this method as a result of its use here and to present it as a viable and rigorous method for multidisciplinary designers to utilise in their own research. Once established as a method, data-informed design fiction will provide a means for

researchers and designers to approach design fiction that is capable of envisioning tangible and practical changes, as well as critically reflecting on current practices and trajectories.

The research also offers relevant and meaningful insights for museum practitioners and regulators. Museums still suffer from stigmas and structural barriers that can prevent engagement with minoritised and marginalised peoples, and can reduce engagement for existing audiences. However, the research establishes the role that trust plays in making museums more accessible and inclusive and showcases the contributions to trust afforded through transparency and mutuality. Further still, the thesis encourages advocacy for following the shifting priorities of data collectors towards qualitative, behavioural data and shows the high value that this data can provide to museums short- and long-term. As museums are seen to have higher-than-average trust, they are better equipped to take risks in terms of novel technologies and data-collection practices, although it is also true that such risks are often seen to be too controversial to sink precious, limited resources into. Museums in the c are desperately underfunded, and will continue to stagnate as an industry until this changes. It is my hope that this research goes some way to assuring museums that transparency and mutuality does not have to be a 'risk' through demonstration of increased relations, trust, and accurate data. My hope is somewhat validated by feedback received from study two, in which two of the three museums present contacted me to say that they had updated their privacy policies in response to the workshop.

Finally, I also present practical recommendations for designers who work with technology in museums. In the literature review, I examined meaningful and useful technological interventions that enhanced museum visit experiences. However, I identified a gap in these examples that highlighted a need for an intervention that was deeply cognisant of its museum context both in terms of the physical space, but also in terms of its users. As such, for the development of technologies that wish to be embedded in the museum long-term and across sites, I advocate for the overt integration of considerations around *power*. Through this lens, I have demonstrated that each actor involved in a museum visit has their own values, motivations, and needs they seek to meet. By enabling actors to meet their own needs, the museum site becomes one not of resistance, but of meaning-making and agency. A second consideration that is increasingly vital to consider is the limited resources museums have to implement and maintain technologies. As such, designers should consider

technologies that can use existing resources such as exhibit information, and which distributes maintenance between different stakeholders, in this case by asking users to monitor and curate their own data. I also argue for a paradigm shift in the conceptualisation of personal data usage to one influenced by gifting literature. I call for an overt shift in personal data collection to understanding data exchange as *relational* from transactional as an important way to increase agency and engagement.

8.4 Critical Reflections and Overcoming Limitations

Multidisciplinary research by its nature is a complex and controversial beast. I came from an academic background in Human Geography into Computer Science where I was a complete novice and, through the input of my industry partner, found myself working in Museological spaces. Finding cohesion across the literature alone presented a daunting challenge, and drawing together seemingly disparate methods, methodologies, and approaches has been central to the development of this research and its outputs. Equally influential was working with an industry partner and through them, meeting a diverse swathe of stakeholders from a range of institutions from funders, to staff, to audiences. These connections solidified my convictions surrounding co-creation and collaborative knowledge generation as central to the thesis.

However, multidisciplinary and incorporating different perspectives were not the key challenge faced during this process. Throughout each section, I have described barriers and limitations faced and overcome, chief amongst which was the impact of COVID-19. In 2020, the **UK** initiated the first of several nationwide lockdowns that closed museums and dramatically restricted people's movement outside of the home. As shown throughout, the closure of museums and the inability to meet participants face-to-face forced the progress of research to temporarily halt, and the intended trajectory of research to be re-evaluated. Whilst workshops and museum visits were able to be re-imagined and hosted in virtual spaces, it is important to acknowledge the ways that the research was not able to adapt. The third study had already begun to be conducted face-to-face when the first lockdown was announced, and changes to the study had to be conceptualised, implemented, and approved by University ethics in a very short amount of time. As such, some nuance in datasets was lost, and the aims of that particular study had to be rewritten to accommodate the loss of interpersonal discourse. Following on, the physical museum space was intended

to play a much larger role in analysis than was realised, leaving some small gaps in knowledge regarding the *lived* behaviours of participants (recognising that lived and self-described behaviours may differ). This was most keenly felt in study four in which the **MuNa** app had to be tested and evaluated in an online exhibit – reducing the number of features that could be evaluated and skewing the usability of **MuNa** to individual visitors navigating the museum space with none of the typical distractions that accompany a museum experience. However, despite the disruption faced and barriers generated, the research has been conducted with validity and rigour, as demonstrated in the respective studies' methodologies and reflections. Furthermore, exciting opportunities for future research arise from these constraints regarding the hybrid evolution of museums and the shifting landscape of contemporary life in response to COVID-19.

One further consideration to highlight, although I contest its designation as a limitation, is the use of sequential design, in which each study built on the findings of the studies that preceded it. This method lends strength to the findings as it offers a transparent process of conducting research that can be reflected on and documented at each stage, whereby the processes and priorities of the final study can be easily witnessed and tracked. Vital to this was also the explicit application of post-structural feminist methodologies that made each stage of the processes rigorous in its evolution (see 3.2). However, this method of research also means that certain elements of the phenomena under investigation that are highlighted as priorities early, are subsequently prioritised throughout each study that follows. In the case of this research, priorities focusing on power, accessibility and inclusivity, and trust were foregrounded. The reason then that this explanation is detailed under 'limitations', is that this necessarily means that some features that may have emerged in later studies were given less weight. However, I argue that this also represents one of the strengths of the research as these themes provided structure and rigour through which to focus this exploration of *museums as place, technology as mediator, and relational personal data*.

8.5 Future Research Opportunities

This research opens multiple opportunities for further investigation. For instance, it would be beneficial to understand the long-term impacts of the technology used to return to museum staff with collected audience data and examine how that data is received and used.

Another important step for future research is to continue to evaluate **MuNa** in an ‘in the wild’ setting. Questions remain regarding how **MuNa** is used by visitors attending in social groups, and what unseen physical and structural barriers are yet to be accommodated in the apps design. The necessary shift to virtual museum experiences that caused these gaps to be unfilled also provides a contemporary and increasingly important gap in research. That is, virtual museum experiences as they currently stand provided limited meaning to virtual audiences, and further exploration of what roles virtual museum experiences can fill would be pertinent to post-COVID museum investigations.

Another interesting angle for future research regards following up on instances of ‘third parties’ being used by museums for data analytics. Who these third parties constitute is, for the most part, indiscernible (with the exception of explicit mention of Google Analytics), as is what data specifically is shared with them, why, and what protections those third parties might offer.

Finally, a key finding from this research is in the importance of everyday acts of resistance. There is currently no literature specific to this phenomenon in museums, despite how important to audience meaning-making it was revealed to be. Embracing acts of resistance as an integral part of utilising the space would not only provide beneficial insight to how people use museums, but further examination would also reveal practical considerations for designers who wish to implement radical technologies within the cultural sphere.

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Appendices

Appendix One – Spreadsheet of Privacy Policy Findings

Key:

Colour coding	Type of policy
No privacy policy found	<ul style="list-style-type: none"> • None (no policy found)
Museum is excluded	<ul style="list-style-type: none"> • Website Only (policy does not cover the physical site) • Local Council (policy relates only to local council data collection) • University (policy relates only to university data collection) • Charity Group (policy relates only to charity group data collection)
Museum is part of a group or collective	<ul style="list-style-type: none"> • Unique (policy is specific to the organisation) • Museum Group (policy is generic to all physical sites operated by the group)
Museum is independent	<ul style="list-style-type: none"> • Unique (policy is specific to the organisation) • Museum Group (policy is generic to all physical sites operated by the group)

Museum Name	Sample Set	Relevant URLs	Type of Policy	Affiliations	#Clicks	Data Types Identified
Aberdeen Art Gallery	Trip Advisor	http://www.aagm.co.uk/	None	Aberdeen Art Gallery and Museum Group	N/A	
Ashmolean	The Culture Trip	https://www.ashmolean.org/	Website Only	University of Oxford	N/A	
BALTIC Centre for Contemporary Arts	Trip Advisor	https://baltic.art/ https://baltic.art/about/privacypolicy	Unique		1	Name, email address, postal address, date of birth, marketing preferences, communication preferences, interests, preferences, transaction history, profiling, cookies, page interaction information, Google analytics

Birmingham Museum and Art Gallery	Trip Advisor	https://www.birminghammuseums.org.uk/bmag https://www.birminghammuseums.org.uk/privacy-policy	Museum Group	Birmingham Museums	2	First name, maiden name, last name, username, marital status, title, date of birth, gender, billing address, delivery address, email address, phone number, bank account details, payment card details, purchase history, donation history, interests, preferences, feedback, survey responses, marketing preferences, communication preferences, gift aid status, publicly available information, third party, profiling, IP address, login data, browser type, browser version, time zone settings, location, browser plug-in types, browser plug-in versions, operating system, platform, other technology on devices, Google analytics, cookies
Brighton Museum and Art Gallery	Trip Advisor	https://brightonmuseums.org.uk/brighton/ https://brightonmuseums.org.uk/about-us/policies-plan/privacy-notices/	Museum Group	Brighton Museums	2	Billing address, shipping address, payment details, email address, CCTV, survey responses, cookies
Bristol Museum and Art Gallery	Trip Advisor	https://www.bristolmuseum.org.uk/bristol-museum-and-art-gallery/ https://www.bristolmuseum.org.uk/privacy/	Museum Group	Bristol Museums	1	Interests, name, email address, school or organisation name, postal address, donation history, payment details, phone number, gift aid status, Google analytics, cookies

Buxton Museum and Art Gallery	Trip Advisor	https://www.derbyshire.gov.uk/leisure/buxton-museum/buxton-museum-and-art-gallery.aspx	Local Council	Derbyshire Council	N/A	
Compton Verney Art Gallery and Park	Trip Advisor	https://www.comptonverney.org.uk/ https://www.comptonverney.org.uk/privacy/	Unique		Search bar	Name, address, email address, phone number, opinions, payment details, gift aid status, marketing preferences, profiling, IP address, login data, browser type, browser version, time zone settings, browser plug-in types, browser plug-in versions, operating system, platform, clickstream, page response times, download errors, web session duration, page interaction information, cookies
Derby Museum and Art Gallery	Trip Advisor	https://www.derbymuseum.org/locations/museum-art-gallery	Website Only	Derby Museums	N/A	
Ferens Art Gallery	Trip Advisor	https://www.hcandl.co.uk/museums-and-galleries/ferens/ferens-art-gallery	Local Council	Hull Culture and Leisure	N/A	
Gallery of Modern Art	Trip Advisor	https://www.glasgowlife.org.uk/museums/venues/gallery-of-modern-art-goma https://www.glasgowlife.org.uk/the-small-print/privacy-statement-for-glasgow-lifestar	Museum Group	Glasgow Life	2	Name, bank account details, address, telephone number, email address, profiling, marketing preferences, IP address, web session duration, browser version

Guildhall Art Gallery	Trip Advisor	https://www.cityoflondon.gov.uk/things-to-do/visit-the-city/attractions/guildhall-galleries/guildhall-art-gallery/Pages/default.aspx	Local Council	City of London	N/A	
Harris Museum and Art Gallery	Trip Advisor	http://www.harrismuseum.org.uk/ http://www.harrismuseum.org.uk/privacy-policy	Unique		1	Name, postal address, phone number, email address, donation history, third party, cookies
Hastings Museum and Art Gallery	Trip Advisor	http://www.hmag.org.uk/	Local Council	Hastings Borough Council	N/A	
Haworth Art Gallery	Trip Advisor	https://www.hyndburnbc.gov.uk/haworthaccrington/	Local Council	Hyndburn Council	N/A	
Hepworth	The Culture Trip	https://hepworthwakefield.org/ https://hepworthwakefield.org/cookie-policy/	Unique		1	Name, postal address, phone number, email address, purchase history, billing address, interests, cookies, IP address, login information, browser type, browser version, time zone, browser plug-in types, browser plug-in versions, operating system, platform, referring website, clickstream, search history, page response times, download errors, web session length, page interaction information, Google analytics
Herbert Art Gallery & Museum	Trip Advisor	https://www.theherbert.org/ https://www.theherbert.org/userfiles/pages/files/Priv	Unique	Culture Coventry Trust	1	Sexuality, sexual health, religion, philosophy, ethnicity, physical health, mental health, trade union membership, politics, genetics, biometrics, criminal history, name, contact information, cookies, analytics

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Hunterian Art Gallery	Trip Advisor	https://www.gla.ac.uk/hunterian/	University	The University of Glasgow	N/A	
Inverness Museum and Art Gallery	Trip Advisor	https://www.highlifehighland.com/inverness-museum-and-art-gallery/	Charity Group	Highlife Highland	N/A	
Jersey Museum & Art Gallery	Trip Advisor	https://www.jerseyheritage.org/places-to-visit/jersey-museum---art-gallery https://www.jerseyheritage.org/privacy-policy	Unique	Jersey Heritage	1	Name, address, email address, phone number, financial information, date of birth, location, interests, IP address, cookies, telephony log, Google analytics, search queries, location
Kelvingrove Art Gallery and Museum	Trip Advisor	https://www.glasgowlife.org.uk/museums/venues/kelvingrove-art-gallery-and-museum https://www.glasgowlife.org.uk/the-small-print/privacy-statement-for-glasgow-lifestar	Unique	Glasgow Life	2	Name, bank account details, address, phone number, email address, profiling, marketing preferences, IP address, web session duration, browser version

Lady Lever Art Gallery	Trip Advisor	https://www.liverpoolmuseums.org.uk/lady-lever-art-gallery https://www.liverpoolmuseums.org.uk/privacy-notice	Museum Group	National Museums Liverpool	1	CCTV, name, address, email address, postal address, name, publicly available information, marketing preferences, Google analytics, cookies, IP address
Laing Art Gallery	Trip Advisor	https://laingartgallery.org.uk/ https://www.twmuseums.org.uk/privacy-policy	Unique	Tyne & Wear Archives & Museums	1	Name, interests, email address, feedback, postcode, cultural preferences, postal address, contact preferences, disability, title, organisation, job title, Cookies, clickstream, MAC address
Lakeside Arts	Local	https://www.lakesidearts.org.uk/ https://www.lakesidearts.org.uk/privacy.html	Unique		1	Purchase history, donation history, interests, prefix, name, gender, email address, age, phone number, payment details, gift aid status, postal address, billing address, third party, social media, publicly available information, IP address, cookies
Leeds Art Gallery	Trip Advisor	https://museumsandgalleries.leeds.gov.uk/leeds-art-gallery/ https://museumsandgalleries.leeds.gov.uk/leeds-museums-and-galleries/privacy-and-data/	Unique	Leeds Museums and Galleries	1	Photographs, email address, marketing preferences, name, address, phone number, date of birth, bank details, cookies

Manchester Art Gallery	Trip Advisor	https://manchesterartgallery.org/ https://manchesterartgallery.org/privacydisclaimer/	Unique		1	Contact information, interests, business interests, payment details, history with gallery, ethnicity, politics, religion, genetics, biometrics, health, sex life, sexual orientation, CCTV, photographs, cookies, google analytics
National Gallery	Trip Advisor	https://www.nationalgallery.org.uk/ https://www.nationalgallery.org.uk/privacy-policy	Unique		1	Name, title, gender, date of birth, email address, phone number, postal address, billing address, delivery address, family details, partner details, relationship to other supporters or members, interests, preferences, feedback, ticket purchase, event attendance, purchase history, donations, payment details, contact preferences, bank account details, gift aid status, CCTV, photographs, MAC address, cookies, media interaction, third party
National Portrait Gallery	Trip Advisor	https://www.npg.org.uk/ https://www.npg.org.uk/footer/privacy-cookies/	Unique		1	Photographs, CCTV, purchase history, payment details, gift aid status, name, contact details, feedback, interests, preferences

New Art Exchange	Local	http://www.nae.org.uk/ http://www.nae.org.uk/page/nae-privacy-policy/1049	Unique		1	Email address, postal address, survey responses, feedback, Google analytics, cookies
New Walk Museum and Art Gallery	Trip Advisor	https://www.leicester.gov.uk/leisure-and-culture/museums-and-galleries/museums-and-historic-venues/new-walk-museum-and-art-gallery/	Local Council	Leicester Council	N/A	
Northampton Museum & Art Gallery	Trip Advisor	https://www.northampton.gov.uk/museums	Local Council	Northampton Borough Council	N/A	
Nottingham Contemporary Art Gallery	Trip Advisor	https://www.nottinghamcontemporary.org/ https://www.nottinghamcontemporary.org/privacy-policy/	Unique		1	Name, email address, postal address, phone number, payment details, purchase history, donation history, third party, interests, preferences, health information, race, religion, politics, event attendance, marketing preferences, profiling, web session details, cookies, page interaction information, email interaction information

Perth Museum and Art Gallery	Trip Advisor	https://www.culturepk.org.uk/ https://www.culturepk.org.uk/privacy-policy/	Unique	Culture Perth and Kinross	1	Personal information, contact details, payment details, interests
Royal Academy of Arts	The Culture Trip	https://www.royalacademy.org.uk https://www.royalacademy.org.uk/privacy	Unique		1	Name, postal address, email address, phone number, age, bank details, payment card details, gift aid status, preferences, third party, postcode, login details, transaction history, cookies, IP address, page interaction information
Russell-Cotes Art Gallery & Museum	Trip Advisor	https://russellcotes.com/ https://russellcotes.com/privacy-and-data-policy/	Unique		1	Name, gender, date of birth, email address, postal address, phone number, family details, partner details, next of kin, payment details, gift aid status, enquiries, contact preferences, CCTV, disability, IP address, pages accessed, web session time
Salford Museum & Art Gallery	Trip Advisor	https://salfordmuseum.com/ https://salfordmuseum.com/privacy-policy/	Museum Group	Salford Community Leisure	2	Name, address, phone number, date of birth, CCTV, email address, photographs, sexuality, sexual health, religion, philosophy, ethnicity, physical health, mental health, trade union membership, politics, genetics, biometrics, criminal history, cookies, google analytics
Scottish National Gallery	Trip Advisor	https://www.nationalgalleries.org/visit/scottish-national-gallery https://www.nationalgalleries.org/website-terms-of-use/general-privacy-notice	Museum Group	Scottish National Galleries	Search bar	Name, email address, social media account, email address, postal address, phone number, feedback, CCTV, date of visit, location, postcode, social media, photographs, opinions, MAC addresses, IP address, location data, apps used

Scottish National Gallery of Modern Art Two	Trip Advisor	https://www.nationalgalleries.org/visit/scottish-national-gallery-modern-art https://www.nationalgalleries.org/website-terms-of-use/general-privacy-notice	Museum Group	Scottish National Galleries	Search bar	Name, email address, social media account, postal address, phone number, feedback, CCTV, date of visit, location, postcode, social media, photographs, opinions, MAC addresses, IP address, location data, apps used
Southampton City Art Gallery	Trip Advisor	https://www.southamptoncityartgallery.com/ https://www.southamptoncityartgallery.com/privacy-policy-cookies/	Website Only		N/A	
Tate Gallery St. Ives	Trip Advisor	https://www.tate.org.uk/visit/tate-st-ives https://www.tate.org.uk/about-us/policies-and-procedures/tate-privacy-policy	Museum Group	Tate	2	Prefix, first name, maiden name, last name, username, partner's name, marital status, title, date of birth, photographs, gender, children's names, billing address, postal address, city, email address, phone number, payment details, purchase history, password, interests, preferences, previous interactions with gallery, ticket purchases, event attendance, art loans, feedback, publicly available information, location, employment history, donation history, politics, hobbies, social media, marketing preferences, IP address, login data, web session time, web session duration, pages requested, referring website, browser type, browser version, operating system, platform, other technology on device, location, cookies, usage data

Tate Modern	The Culture Trip	https://www.tate.org.uk/visit/tate-modern https://www.tate.org.uk/about-us/policies-and-procedures/tate-privacy-policy	Museum Group	Tate	2	IP address, login data, web session time, web session duration, pages requested, referring website, browser type, browser version, operating system, platform, other technology on device, location, cookies, usage data
Tenby Museum and Art Gallery	Trip Advisor	http://www.tenbymuseum.org.uk/ http://www.tenbymuseum.org.uk/wp-content/uploads/2018/04/Privacy-Notice.pdf	Unique		2	Name, title, gender, date of birth, postal address, email address, phone number, family details, partner details, purchase history, event attendance, contact preferences, gift aid status, payment details, employment information, professional activities, CCTV, survey responses, feedback, cookies
The Courtauld Gallery	Trip Advisor	https://courtauld.ac.uk/gallery https://courtauld.ac.uk/about/policies/privacy	Unique	Courtauld Institute of Art/University of London	2	Racial origin, ethnicity, politics, religion, philosophy, trade union membership, mental health, physical health, sex life, sexual orientation, genetic data, biometric data, contact details, marketing preferences, technical data, usage data

The Fitzwilliam Museum	The Culture Trip	https://www.fitzmuseum.cam.ac.uk/ https://www.fitzmuseum.cam.ac.uk/aboutus/support/fmdt/privacynotice	Unique	University of Cambridge Museums and Botanic Gardens	3	Name, location, third party, racial origin, ethnicity, genetics, biometrics, sex life, sexual orientation
The Lowry	Trip Advisor	https://thelowry.com/ https://thelowry.com/privacy-policy-for-customers/	Unique		1	Name, email address, address, phone number, transaction history, purchase history, publicly available information, children, disability, religion, politics, sexuality, ethnicity, CCTV, marketing preferences, cookies, email interaction
The McManus: Dundee's Art Gallery & Museum	Trip Advisor	https://www.mcmanus.co.uk/	None	Leisure and Culture Dundee	N/A	
The Potteries Museum and Art Gallery	Trip Advisor	http://www.stokemuseums.org.uk/pmag/ http://www.stokemuseums.org.uk/pmag/privacy-policy/	Unique	Stoke-on-Trent Museums	1	Name, email address , IP address, cookies, Google analytics

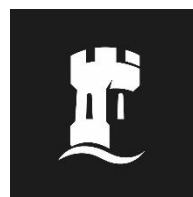
The Sainsbury Centre for Visual Arts	The Culture Trip	https://sainsburycentre.ac.uk/ https://www.sainsburycentre.ac.uk/privacy-policy/	Unique	University of East Anglia	2	Disability, name, postal address, phone number, email address, purchase history, billing address, bank details, donation history, gift aid status, marketing preferences, interests, contact preferences, publicly available information, location, preferences, email interaction
Towner Art Gallery	Trip Advisor	https://www.townereastboorne.org.uk/ https://www.townereastboorne.org.uk/privacy-policy/	Unique		1	Contact details, biographical information, professional activities, relationship to other contacts connected with museum, donation history, supporter status, social media, marketing preferences, location, interests, preferences, publicly available information, cookies, google analytics
Tullie House Museum & Art Gallery	Trip Advisor	https://www.tulliehouse.co.uk/ https://www.tulliehouse.co.uk/sites/default/files/Tullie%20House%20Museum%20Privacy%20Policy%20April%202018.pdf	Unique		1	Prefix, name, email address, phone number, payment details, postcode, postal address, bank details, payment details, IP address, cookies

Turner Contemporary	The Culture Trip	https://turnercontemporary.org/ https://turnercontemporary.org/privacy-policy-and-cookies/	Unique		1	Name, postal address, email address, phone number, social media, date of birth, bank details, payment card details, interests, event attendance, photographs, gift aid status, feedback, survey responses, transaction history, third party, billing details, marketing preferences, communication preferences, publicly available information, health, ethnicity, religion, politics, genetics, biometrics, disability, IP address, browser type, browser language, location, clickstream, page interaction information, cookies
Victoria Art Gallery	Trip Advisor	https://www.victoriagal.org.uk/	Website Only		N/A	
Walker Art Gallery	The Culture Trip	https://www.liverpoolmuseums.org.uk/walker-art-gallery https://www.liverpoolmuseums.org.uk/privacy-notice	Museum Group	National Museums Liverpool	1	CCTV, name, address, email address, postal address, name, publicly available information, marketing preferences, Google analytics, cookies, IP address
Warrington Museum & Art Gallery	Trip Advisor	https://wmag.culturewarrington.org/ https://wmag.culturewarrington.org/privacy-policy/	Unique	Culture Warrington	1	Name, email address, postal address, phone number, IP address, cookies, browser type, ISP, clickstream, platform, web session time, web session data

Whitworth Art Gallery	The Culture Trip	https://www.whitworth.manchester.ac.uk/ https://documents.manchester.ac.uk/display.aspx?DocID=37245	Unique	Manchester University	3	Contact information, interests, business interests, payment details, history with gallery, ethnicity, political opinion, religion, genetics, health, sex life, sexual orientation, CCTV, photographs
Wolverhampton Art Gallery	Trip Advisor	http://www.wolverhamptonart.org.uk/visit/wolves/ http://www.wolverhamptonart.org.uk/privacy-notice/	Museum Group	Wolverhampton Arts and Culture	Search bar	Email address, marketing preferences, cookies
Worthing Museum & Art Gallery	Trip Advisor	https://worthingmuseum.co.uk/ https://worthingmuseum.co.uk/privacy-policy-and-terms-conditions/	Museum Group	Worthing Theatres	1	Name, title, date of birth, postal address, email address, phone number, payment card details, transaction history, disability, location, CCTV, photographs, gender, race, ethnicity, sexual orientation, publicly available information, survey responses, social media, feedback, location, operating system, browser type, page interaction information, cookies, Google analytics
York Art Gallery	Trip Advisor	https://www.yorkartgallery.org.uk/ https://www.yorkmuseums-trust.org.uk/privacy-policy/	Unique	York Museums Trust	1	Name, address, email address, phone number, date of birth, payment details, purchase history, gift aid status, donation history, photographs, contact preferences, gender, employment status, demographic information, CCTV, feedback, IP address

Yorkshire Sculpture Park	The Culture Trip	https://yosp.org.uk/ https://yosp.org.uk/privacy-policy	Unique		1	Name, gender, date of birth, email address, postal address, phone number, family's details, partner's details, financial information, gift aid status, contact preferences, car registration, event attendance, CCTV, photographs, frequency of visits, purchasing history, volunteer status, donation status, disability, cookies, website visits, Google analytics, referring website, web session time, web session length, clickstream, Wi-Fi usage
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PROJECT INFORMATION



University of
Nottingham
UK | CHINA | MALAYSIA

Date: Wednesday 9th October 2019

Project: Curating the Audience PhD Project

School of Computer Science Ethics Reference: CS-2018-R68

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Purpose of the research.

The workshops represent the first stage of a PhD project working to understand and enhance relationships between audiences, art, and venues, through exploring what personal data is collected about visitors, what that data is used for, and what personal data may be more useful or valuable to arts venues. The workshops will last two hours, and will provide an opportunity for the venues to consider their collection and use of personal data.

Nature of participation.

Participation in the research is voluntary and relies on participants providing data and consent through the consent forms provided.

Participant engagement.

Participants will be required to take part in a two hour workshop session, which will be recorded for transcription purposes. Workshops will involve participation in discussions and activities, and participants will also be asked to provide some basic demographic/personal data such as their background, role at the gallery, and gallery/museum visiting habits.

Participants also have the option to contact, or be contacted by the researcher at a later date, for follow-up interviews. These interviews will also be recorded for transcription purposes. Participation in these interviews are not required for participation in the workshop.

Benefits and risks of the research.

Your participation is contributing to a wider PhD project, which aims to enable galleries to gather useful, relevant data about their visitors. The workshops will facilitate discussion around standard data gathering practice, and what changes could be enacted both short term and long term. It is

anticipated that the PhD project will ultimately enable participating galleries to represent exemplary best practice in visitor data collection/donation.

There is always a minor risk that data collected may identify you in research reports and publications. However, your name will not be associated with any data, transcripts will be fully anonymised, and audio or video collected will not be shared beyond the project team.

Use of your data.

The data will be used in supervision sessions and project reports for the purposes of the research. It will be anonymised and disseminated in the final PhD thesis, and may be presented at conferences, or as publications stored online and on databases.

Future use of your data.

Your anonymised data may be archived and reused in future for purposes that are in the public interest, or for historical, scientific or statistical purposes. Archiving anonymised data allows future research to be carried out more effectively. Your data will be stored on secure University of Nottingham servers that are password protected. Any physical documentation will also be stored in a locked filing cabinet in the School of Computer Science.

Mixed personal data.

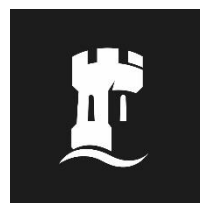
The research will gather 'mixed' personal data, i.e., data that simultaneously involves multiple participants and/or is irreducibly social in nature. In this case, mixed personal data includes multi-party conversation recorded on audio or video. We can only delete mixed personal data if all parties to it withdraw their consent. However, we will redact any data that identifies you in public presentations and reports of this research insofar as this is practicable and the data has not already been made public by yourself (e.g., posted on social media).

Procedure for withdrawal from the research.

You may withdraw from the study at any time and do not have to give reasons for why you no longer want to take part. If you wish to withdraw please contact the researcher who gathered the data at harriet.cameron@nottingham.ac.uk. If you receive no response from the researcher, please contact the School of Computer Science's Ethics Committee.

Contact details of the ethics committee. If you wish to file a complaint or exercise your rights you can contact the Ethics Committee at the following address: cs-ethicsadmin@cs.nott.ac.uk

CONSENT FORM



University of
Nottingham
UK | CHINA | MALAYSIA

Date: Wednesday 9th October 2019

Project: Curating the Audience PhD Project

School of Computer Science Ethics Reference: CS-2018-R68

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Please tick the appropriate boxes

Yes No

1. Taking part in the study

- | | | |
|---|--------------------------|--------------------------|
| a) I have read and understood the project information sheet dated 09/10/2019, or it has been read to me. I have been able to ask questions about the study and my questions have been answered satisfactorily. | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. If I withdraw, I understand that my individual data will be deleted, but that my data including other people will not be deleted. | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I understand that taking part in the study requires me to provide data and that this will involve audio recordings taken during focus groups, and some basic demographic/personal data. | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I give permission to be contacted at a later date for a follow-up, individual interview. | <input type="checkbox"/> | <input type="checkbox"/> |

2. Use of my data in the study

- | | | |
|---|--------------------------|--------------------------|
| a) I understand that my name will not be associated with any data | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I agree that the data provided by me may be used for the following purposes: | | |
| – Presentation and discussion of the project and its results in research activities (e.g., in supervision sessions, project meetings, conferences). | <input type="checkbox"/> | <input type="checkbox"/> |
| – Publications and reports, including a PhD thesis describing the project and its results. | <input type="checkbox"/> | <input type="checkbox"/> |
| – Dissemination of the project and its results, including publication of data on web pages and <i>databases</i> . | <input type="checkbox"/> | <input type="checkbox"/> |

c) I understand that only quotes from transcriptions of audio recordings will be made publicly available, and that any audio recordings made will not be shared publicly.

d) I give permission for my words to be quoted for the purposes described above.

Please tick the appropriate boxes **Yes** **No**

3. Reuse of my data

a) I give permission for the data that I provide to be reused for the sole purposes of future research and learning.

b) I understand and agree that this may involve depositing my anonymised data in a data repository, which may be accessed by other researchers

4. Security of my data

a) I understand that safeguards will be put in place to protect my identity and my data during the research, and if my data is kept for future use.

b) I confirm that a written copy of these safeguards has been given to me in the University's privacy notice, and that they have been described to me and are acceptable to me.

c) I understand that no computer system is completely secure and that there is a risk that a third party could obtain a copy of my data.

5. Copyright

a) I give permission for data gathered during this project to be used, copied, excerpted, annotated, displayed and distributed for the purposes to which I have consented.

6. Signatures (sign as appropriate)

Name of participant (IN CAPITALS) _____
Signature _____
Date

If applicable:

For participants unable to sign their name, mark the box instead of signing

I have witnessed the accurate reading of the consent form with the participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness (IN CAPITALS)

Signature

Date

I have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Name of researcher (IN CAPITALS)

Signature

Date

7. Researcher's contact details

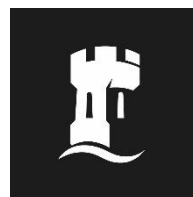
Name: Harriet Cameron

Email: harriet.cameron@nottingham.ac.uk

Supervisor: Prof. Boriana Koleva

Email: pszbnk@exmail.nottingham.ac.uk

PROJECT INFORMATION



University of
Nottingham
UK | CHINA | MALAYSIA

Date: Monday 9th March 2020

Project: Curating Audiences: Enhancing Visitor/Venue Relationships through Ethical Personal Data Donation

School of Computer Science Ethics Reference: CS-2018-R68

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Purpose of the research.

The workshops represent the first stage of a PhD project working to understand and enhance relationships between audiences, art, and venues. These workshops aim to understand what personal data audiences such as yourself are willing to donate to galleries, and what the value of that data is to you. The workshops will last one and a half hours, and will ask you to help design a fair, transparent, and useful means to donate your personal data, and receive something in return for your donation in future visits.

Nature of participation.

Participation in the research is voluntary and relies on you providing data, and consent through the consent forms provided.

Participant engagement.

You will be required to take part in a workshop session, which will be recorded for transcription purposes. Workshops are expected to take one and a half hours, and will involve participation in discussions and activities. You will also be asked to provide some basic demographic/personal data such as background and gallery/museum visiting habits.

There is also opportunity to contact, or be contacted by the researcher at a later date, for follow-up interviews. These interviews will also be recorded for transcription purposes and are not compulsory for participation in the workshops.

Benefits and risks of the research.

Your participation allows us to understand the value of your personal data in the context of galleries, and explores how galleries can recognise and respond to the donation of that personal

data. Your participation will allow us to design and test this new form of data collection, leading to a more transparent and meaningful relationship between you and the gallery.

There is always a minor risk that data collected may identify you in research reports and publications. However, your name will not be associated with any data, transcripts will be fully anonymised, and audio or video collected will not be shared beyond the project team.

Use of your data.

Your data will be used in supervision sessions and project reports for the purposes of the research. It will be anonymised and disseminated in the final PhD thesis, and may be presented at conferences, or as publications stored online and on databases.

Future use of your data.

Your anonymised data may be archived and reused in future for purposes that are in the public interest, or for historical, scientific or statistical purposes. Archiving anonymised data allows future research to be carried out more effectively. Your data will be stored on secure University of Nottingham servers that are password protected. Any physical documentation will also be stored in a locked filing cabinet in the School of Computer Science.

Mixed personal data.

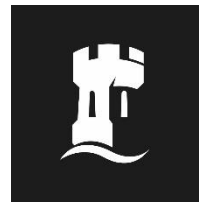
The research will gather 'mixed' personal data, i.e., data that simultaneously involves multiple participants and/or is irreducibly social in nature. In this case, mixed personal data includes multi-party conversation recorded on audio or video. We can only delete mixed personal data if all parties to it withdraw their consent. However, we will redact any data that identifies you in public presentations and reports of this research insofar as this is practicable and the data has not already been made public by yourself (e.g., posted on social media).

Procedure for withdrawal from the research.

You may withdraw from the study at any time and do not have to give reasons for why you no longer want to take part. If you wish to withdraw please contact the researcher who gathered the data at harriet.cameron@nottingham.ac.uk. If you receive no response from the researcher, please contact the School of Computer Science's Ethics Committee.

Contact details of the ethics committee. If you wish to file a complaint or exercise your rights you can contact the Ethics Committee at the following address: cs-ethicsadmin@cs.nott.ac.uk

CONSENT FORM



University of
Nottingham
UK | CHINA | MALAYSIA

Date: Monday 9th March 2020

Project: Curating the Audience PhD Project

School of Computer Science Ethics Reference: CS-2018-R68

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Please tick the appropriate boxes

Yes No

1. Taking part in the study

- | | | |
|---|--------------------------|--------------------------|
| a) I have read and understood the project information sheet dated 09/10/2019, or it has been read to me. I have been able to ask questions about the study and my questions have been answered satisfactorily. | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. If I withdraw, I understand that my individual data will be deleted, but that my data including other people will not be deleted. | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I understand that taking part in the study requires me to provide data and that this will involve audio recordings taken during focus groups, and some basic demographic/personal data. | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I give permission to be contacted at a later date for a follow-up, individual interview. | <input type="checkbox"/> | <input type="checkbox"/> |

2. Use of my data in the study

- | | | |
|---|--------------------------|--------------------------|
| a) I understand that my name will not be associated with any data | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I agree that the data provided by me may be used for the following purposes: | | |
| – Presentation and discussion of the project and its results in research activities (e.g., in supervision sessions, project meetings, conferences). | <input type="checkbox"/> | <input type="checkbox"/> |
| – Publications and reports, including a PhD thesis describing the project and its results. | <input type="checkbox"/> | <input type="checkbox"/> |
| – Dissemination of the project and its results, including publication of data on web pages and <i>databases</i> . | <input type="checkbox"/> | <input type="checkbox"/> |

c) I understand that only quotes from transcriptions of audio recordings will be made publicly available, and that any audio recordings made will not be shared publicly.

d) I give permission for my words to be quoted for the purposes described above.

Please tick the appropriate boxes **Yes** **No**

3. Reuse of my data

a) I give permission for the data that I provide to be reused for the sole purposes of future research and learning.

b) I understand and agree that this may involve depositing my anonymised data in a data repository, which may be accessed by other researchers

4. Security of my data

a) I understand that safeguards will be put in place to protect my identity and my data during the research, and if my data is kept for future use.

b) I confirm that a written copy of these safeguards has been given to me in the University's privacy notice, and that they have been described to me and are acceptable to me.

c) I understand that no computer system is completely secure and that there is a risk that a third party could obtain a copy of my data.

5. Copyright

a) I give permission for data gathered during this project to be used, copied, excerpted, annotated, displayed and distributed for the purposes to which I have consented.

6. Signatures (sign as appropriate)

Name of participant (IN CAPITALS)

Signature

Date

If applicable:

For participants unable to sign their name, mark the box instead of signing

I have witnessed the accurate reading of the consent form with the participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness (IN CAPITALS)

Signature

Date

I have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Name of researcher (IN CAPITALS)

Signature

Date

7. Researcher's contact details

Name: Harriet Cameron

Email: harriet.cameron@nottingham.ac.uk

Supervisor: Prof. Boriana Koleva

Email: pszbnk@exmail.nottingham.ac.uk

PROJECT INFORMATION



University of
Nottingham
UK | CHINA | MALAYSIA

Date: May-June 2020

Project: Curating Audiences: Enhancing Visitor/Venue Relationships through Ethical Personal Data Donation

School of Computer Science Ethics Reference: CS-2018-R68

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Purpose of the research.

The project represents the first stage of a PhD project working to understand and enhance relationships between audiences, art, and venues. We aim to understand what personal data audiences such as yourself are willing to donate to galleries, and what the value of that data is to you. Participation will take around 45 minutes and will ask you to help design a fair, transparent, and useful means to donate your personal data, and receive something in return for your donation in future visits.

Nature of participation.

Participation in the research is voluntary and relies on you providing data, and consent through the consent forms provided.

Participant engagement.

You will be required to watch some videos through the website hrcameron.tech and complete the activities detailed within those videos. To complete those activities, you will be able to access a Mural canvas which will be sent to you once consent has been given. I will also ask you to provide some basic demographic/personal data such as background and gallery/museum visiting habits in one of these documents, although that will be private and only visible to yourself and I.

Mural is a website which allows us to create collaborative working documents together in real time. Their privacy policy can be found here: <https://www.mural.co/terms/privacy-policy>. Mural are GDPR compliant with their data handling, although data will be stored on a United States server.

There is also opportunity to contact, or be contacted by the researcher at a later date, for follow-up interviews. These interviews will also be recorded for transcription purposes and are not compulsory for participation in the workshops.

Benefits and risks of the research.

Your participation allows us to understand the value of your personal data in the context of galleries, and explores how galleries can recognise and respond to the donation of that personal data. Your participation will allow us to design and test this new form of data collection, leading to a more transparent and meaningful relationship between you and the gallery.

There is always a minor risk that data collected may identify you in research reports and publications. However, your name will not be associated with any data, transcripts will be fully anonymised, and audio or video collected will not be shared beyond the project team.

Use of your data.

Your data will be used in supervision sessions and project reports for the purposes of the research. It will be anonymised and disseminated in the final PhD thesis, and may be presented at conferences, or as publications stored online and on databases.

Future use of your data.

Your anonymised data may be archived and reused in future for purposes that are in the public interest, or for historical, scientific or statistical purposes. Archiving anonymised data allows future research to be carried out more effectively. Your data will be stored on secure University of Nottingham servers that are password protected. Any physical documentation will also be stored in a locked filing cabinet in the School of Computer Science.

Mixed personal data.

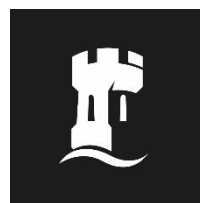
The research will gather 'mixed' personal data, i.e., data that simultaneously involves multiple participants and/or is irreducibly social in nature. In this case, mixed personal data includes multi-party conversation recorded on audio or video. We can only delete mixed personal data if all parties to it withdraw their consent. However, we will redact any data that identifies you in public presentations and reports of this research insofar as this is practicable and the data has not already been made public by yourself (e.g., posted on social media).

Procedure for withdrawal from the research.

You may withdraw from the study at any time and do not have to give reasons for why you no longer want to take part. If you wish to withdraw please contact the researcher who gathered the data at harriet.cameron@nottingham.ac.uk. If you receive no response from the researcher, please contact the School of Computer Science's Ethics Committee.

Contact details of the ethics committee. If you wish to file a complaint or exercise your rights you can contact the Ethics Committee at the following address: cs-ethicsadmin@cs.nott.ac.uk

CONSENT FORM



University of
Nottingham
UK | CHINA | MALAYSIA

Date: May – June 2020

Project: Curating the Audience PhD Project

School of Computer Science Ethics Reference: CS-2018-R68

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Please tick the appropriate boxes

Yes No

1. Taking part in the study

- | | | |
|---|--------------------------|--------------------------|
| a) I have read and understood the project information sheet dated May - June 2020, or it has been read to me. I have been able to ask questions about the study and my questions have been answered satisfactorily. | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason. If I withdraw, I understand that my individual data will be deleted, but that my data including other people will not be deleted. | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I understand that taking part in the study requires me to provide data and that this will involve some basic demographic/personal data. | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I give permission to be contacted at a later date for a follow-up, individual interview. | <input type="checkbox"/> | <input type="checkbox"/> |
| e) I understand that a third party website will be used for data collection (Mural) and agree to the use of this programme | <input type="checkbox"/> | <input type="checkbox"/> |

2. Use of my data in the study

- | | | |
|---|--------------------------|--------------------------|
| a) I understand that my name will not be associated with any data | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I agree that the data provided by me may be used for the following purposes: | | |
| – Presentation and discussion of the project and its results in research activities (e.g., in supervision sessions, project meetings, conferences). | <input type="checkbox"/> | <input type="checkbox"/> |
| – Publications and reports, including a PhD thesis describing the project and its results. | <input type="checkbox"/> | <input type="checkbox"/> |

- Dissemination of the project and its results, including publication of data on web pages and *databases*.

c) I give permission for my words to be quoted for the purposes described above.

Please tick the appropriate boxes Yes No

3. Reuse of my data

a) I give permission for the data that I provide to be reused for the sole purposes of future research and learning.

b) I understand and agree that this may involve depositing my anonymised data in a data repository, which may be accessed by other researchers

4. Security of my data

a) I understand that safeguards will be put in place to protect my identity and my data during the research, and if my data is kept for future use.

b) I confirm that a written copy of these safeguards has been given to me in the University's privacy notice, and that they have been described to me and are acceptable to me.

c) I understand that no computer system is completely secure and that there is a risk that a third party could obtain a copy of my data.

5. Copyright

a) I give permission for data gathered during this project to be used, copied, excerpted, annotated, displayed and distributed for the purposes to which I have consented.

6. Signatures (sign as appropriate)

Name of participant (IN CAPITALS)

Electronic Signature*

Date

*If you are unable to provide an electronic signature: Please simply retype your name in the electronic signature box. By typing your name in the signature box, you agree that this applies as the equivalent of physically signing your agreement to participate in the study.

If applicable:

For participants unable to sign their name, mark the box instead of signing

I have witnessed the accurate reading of the consent form with the participant and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness (IN CAPITALS)

Signature

Date

I have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Name of researcher (IN CAPITALS)

Signature

Date

7. Researcher's contact details

Name: Harriet Cameron

Email: harriet.cameron@nottingham.ac.uk

Supervisor: Prof. Boriana Koleva

Email: pszbnk@exmail.nottingham.ac.uk

Appendix Four – Data-Informed Design Fiction

You slump into your seat on your way home and gaze sightlessly out of the window, decompressing from a long day of work. There have been a lot of long days at work recently and you pine to do something different one day soon. As the greyness of the typical British cityscape continues to pass by outside, dusk falling and artificial lights gradually recreating the landscape, you reach up to activate your AweSpex goggles. Your AweSpex are a few years old now, one of the earlier models that had some trouble with fastening to the bridge of the nose, but yours are still going strong. With a simple tap, the holographic lenses flare up in front of your eyes and show an interactive overlay that integrates with your environment. You idly flick through your notifications from the day; dismissing some of the generic messages you see from various companies flashing up they fly past your window. You notice a notification from the MuNa application. There's a new exhibit within your parameters that might interested you. The museum is one you know well; you hadn't realised they were already opening a new show. Time flies.

Suddenly a little more focused, you select the notification and flick open the MuNa app. It blinks to life and presents your profile to you. You glance at the brief description of you and your interests and automatically navigate through to see the list of museums and galleries you have visited over the last few years. You absentmindedly tap onto one from nearly a year ago now. You had enjoyed the show immensely, and in front of you is presented a collection of photos you had taken while you were there of some of your favourite pieces, some even connected to short audio clips you had narrated to remind yourself of your thoughts. You smile as you re-listen to an anecdote about an artefact that had inspired you to think of an almost-forgotten childhood friend.

You flick back to the homepage and zone in on your new notification. MuNa explains in a bright, crisp font, that this new exhibit is being recommended to you because you had previously updated your preferences to suggest that you wanted to be intellectually challenged. The new exhibit contains topics that you have not formally engaged with before, it says, and will present these ideas in a way that you may not be familiar with.

It's been a while since you went to see a new exhibit, and a challenge sounds appealing. You mark that you are interested, and MuNa generates a list of some basic media that you might enjoy before you go. It knows the exhibit content is new to you, so the content it suggests is rudimentary and easy to follow. You remember a few months ago when you went to yet another exhibit from one of your favourite artists and the app had suggested much higher-level media that went deep into the background of the exhibit on show; inferring, based on your previous usage, that you already had the basics covered and would want to dive deeper.

You scan through the tags for this exhibit and see a range of themes: politics, LGBTQI+, exploitation, gender, race and so on. Some of the tags are highlighted, a dazzling green for new subjects, and red to warn you of content it knows you might find harder to approach. You make a mental note of those; you can decide when you arrive how to engage with uncomfortable topics. The app also offers some contextualisation for the exhibit, suggesting

a curated series of recent news articles that cover related topics and two blog posts – one in a familiar style from a familiar site that you find yourself nodding along with as you read, and another that politically leans the other way from your comfort zone, forcing you to think about different perspectives presented in this particular exhibit. This is just what you needed.

You pick a Wednesday evening to visit the museum as a treat after a long week at work. The entrance of the museum is familiar and greets you softly, lighting up the screens below the museum's name plaque. It displays your chosen user icon with small, pixelated fireworks going off. It's gaudy, almost a bit cliché, but since you've chosen it yourself (albeit at a vernissage with a little bit too much free prosecco), you can't help but laugh. "It's good to visit again", you think to yourself.

After stepping into the foyer of the museum and having a quick chat with the staff, your AweSpex's nose clip vibrates. You give a practiced flick, activating it with ease. You recently upgraded its outer shell: It is golden, with small hammered indents that the light catches. Your friend's buddy fabs them in her own lab. Despite its handmade finish it's light; nothing but silicone-coated fibres and microelectronics. After a small blip, the museum navigation interface, MuNa, opens, floating semi-transparently in front of your eyes. MuNa updates you on what's currently happening in the museum, pulling up some of the media you were looking at before. Looking to the side, you bring up the menu to have a robot buddy for your visit. Blinking twice and standing still, you let the museum's environment calibrate so it can accurately track you indoors.

Today, you're not in the highest of spirits. Your body feels inflamed, a prickling tension sitting behind your eyelids. Your hip joints hurt more than usual. But in between work and household chores and instant noodles and trying to have a life, pain is an everyday occurrence that you live with, like a sticky piece of tape. Still, you're excited to immerse yourself in art, to try and be present with yourself in this moment.

The tintinnabulation of a little museum bot gently beeping beside you catches your attention. It is a sleek black cassette with a screen and camera in the front, tilted so it is looking at you. "Hey there buddy", you greet it. The bot wiggles its body, blinking its LED lights at you. It turns around and lifts its body, making it comfortable for you to reach it. A compartment in the back of it pops open and you store away your bag and coat. The bot beeps at you again. "Ready to go", you tell it, and step into the exhibition space.

Entering part of the gallery, you walk up to a canvas with a wild, abstract paper collage. It draws you in, makes you think of sun-bleached advertising posters plastered over each other. "Buddy", you say softly, looking at the museum bot, "would you mind?". The museum bot plays a happy jingle and rolls further towards the canvas. After some whirring and clicks, it has shaped its body into a seat. You carefully sit on it, wriggling a bit until you are comfortable. The seat shifts, gently aligning to support your spine. You exhale carefully, feeling exhaustion in your bones. Looking up at the collage, you let your eyes wander. The MuNa interface pings you after a while: "would you like to see this up-close?" the prompt asks. You confirm by blinking.

With a soft puff of air the canvas slides down the wall, letting your eyes rest on it more easily. MuNa zooms in, focusing on the area you were studying the most. It offers a side-by-side comparison of multiple zoomed stages of the canvas. "This art piece engages with the idea of trying to dupe its viewer", the interface offers, "in this case, it focuses on faking a sense of nostalgia. As the focussed elements showcase, the collage is not human-made from actual paper, but it was designed to look this way". Looking to the side, you gesture "HOW?". A video begins to play, showing a clip of the 3D printing process. You blink again, "WHO?". The interface brings up the profile of the artist, with a photo of a smiling gender-ambiguous person with a shaved head and large baubles as earrings. You gesture once more, snapping your fingers this time; "WHY?". "This is not to say that nostalgia is bad in itself" - an audio clip appears, featuring the voice of the artist - "But honestly speaking, I am frustrated how it is being exploited to sell people things they don't need, especially right now". You nod in agreement; many times have you considered dropping your ad agency, just because George, art director extraordinaire, cannot shut up about invoking the 'good old days'. You write words for a living; you don't want to sell dreams.

The bot beeps gently, showing you a ":)" on its screen. "You're right", you tell it, "let's check out the other things."

"What would you like to continue with?", the museum interface asks you after you enter the next gallery space. There are a few options; learn something new, be uncomfortable, something similar. It generates new potential paths for you to walk, represented as colourful lines in the space around you and tagged neatly with your chosen profile keywords.

You feel calm but curious. "Teach me something new", you announce quietly. The other potential routes fade as a forest green line is highlighted for you to follow. It leads you to an open area. The walls are lined with portraits of leaders, showcasing an overwhelming number of white, middle-aged men. The interface floats up again; in your periphery it shows you an overlay of photos, paintings, and sketches on top of the existing paintings that point out discrepancies in their appearances. Broad shoulders, perfectly straight teeth, muscles and luscious fur coats, great height, and glittering eyes; artificially airbrushed and invented. "Appearance and control over your image are important factors for conveying power", the interface elaborates. Passing another painting, the interface shows you a hologram of one of the former monarchs next to you; he towers over you. "The painter stretched his legs and torso to make him seem taller, but other depictions allow a more realistic overview", the interface chimes. The man shrinks next to you, you're now on eye-level. It makes you giggle a bit.

The next hour flies by in a blur; between colourful strokes, zoomed out photos of Jupiter, dense typography layouts and VR sculptures, you feel done for the day. You make your way down to the museum foyer, letting the museum bot dock into its assigned charging spot. It beeps to say goodbye and powers off.

Stepping outside the museum threshold, MuNa slides back into your view. "You haven't visited for a while, but last time, you set up an automatic donation. Is that still okay?", it

reads, next to a floating ``100 credits''. You adjust the credits slider to ``150'' and confirm happily.

On your way home you sit a little taller. Intellectually stimulated and emotionally tired, you revel in the post-museum feeling. A little warm, a little nostalgic, a little curious, you feel calmer and more centred. It usually takes you a little time to process a new exhibit, and so you let your mind percolate in the background as you half-listen to a podcast on the AweSpex. The podcast was recommended to you in the summary uploaded to your MuNa profile on your way out and talks about some of the content you learned about today.

You beeline for the kitchen when you get home and settle in for the remainder of the evening with a cup of tea. You open up MuNa once again on your AweSpex and idly flick through the various pictures and notes you captured earlier, shifting the order and position of them until you are satisfied that it makes sense to you. You casually add some new annotations to the Portrayal and Aesthetics of 'Great Leaders' section with thoughts the podcast had prompted on the way home; power can come from many places, including illusory portrayal, you note.

MuNa asks if you would like to see your summary. The summary shows you the route you took around the exhibit, which pieces you spent the most time with, and even which pieces prompted the strongest physiological reactions in you. You've never really bothered with the summary, it's a function for other people, you think, but you don't deactivate the summary in your settings. You never do. It helps the gallery, after all. You remember MuNa walking you through the different kinds of data it collected and telling you what that data would be used for by the various museums when you first set up your profile. Your trajectory around the site helps them personalise suggested routes, prioritising the pieces you're most likely interested in seeing before guiding you to less relevant content. The physiological responses are aggregated and allow the museums to keep on top of current sentiment. The data about where you spent the most time can be used live to prevent build up in certain exhibits, with the suggested routes tailoring to prevent queues and make sure that everyone is able to see the content they would like to. You particularly appreciate that last one, knowing that you can avoid being jostled about and bombarded with background noise allows you to wander the gallery at your own pace, knowing with confidence you have space to sit when you need to and that the overall experience will be as relaxing as possible.

You take a sip of your drink and respond to the prompt on your visor; yes, the gallery can anonymise and keep the data from your visit. You watch the little animation appear in the corner that shows your data being anonymised locally on the AweSpex before being uploaded to the gallery servers. The page reloads as your profile updates to include the new exhibit. At some point in the next couple of weeks you might access the suggested further reading feature, you're quite curious to know more about the duping nostalgia artist. But not tonight; tonight you ready yourself for bed and snuggle down under your blankets, closing your eyes. The gentle hum of your AweSpex charging in the background provides a familiar sense of comfort and you sigh in contentment, drifting off to images of collages and portraits and smiley faced helper bots.

PROJECT INFORMATION



University of
Nottingham
UK | CHINA | MALAYSIA

Date: 1st March 2021

Project: Curating Audiences: Enhancing Visitor/Venue Relationships through Ethical Personal Data Donation

School of Computer Science Ethics Reference: CS-2020-R31

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Purpose of the research.

This research project represents the third stage of a PhD project working to understand and enhance relationships between audiences, art, and venues. These workshops aim to understand what personal data audiences such as yourself are willing to donate to galleries, and what the value of that data is to you. This project will require your participation in two to three sessions, in which you will be guided through filling in an online 'profile' about your museum and gallery visiting preferences, 'visiting' a gallery through an online, virtual museum tour, and then discussing with me the personal data collected along the way.

Nature of participation.

Participation in the research is voluntary and relies on you providing data, and consent through the consent forms provided.

Participant engagement.

You will be required to take part in a maximum of three sessions over the period of 2 to 3 hours (depending on your availability, the project may be completed in two sessions). The sessions will involve two semi-structured interviews, and a 'visit' to a virtual gallery. During the first interview, we will collaboratively create a 'profile' based on your museum visiting preferences and recent history

(over 2 or 3 years). This profile will be created on collaborative software mural.com²³. This will include some very basic demographic information about you such as name, occupation, and gender identifier.

Interviews will be recorded via audio and video (with your consent) for transcription purposes. During your 'visit' to the gallery, there will also be opportunities for you to screenshot your view and leave audio notes for your own future references. These will also be stored and transcribed by the researcher.

Benefits and risks of the research.

Your participation allows us to understand the value of your personal data in the context of galleries, and explores how galleries can recognise and respond to the donation of that personal data. Your participation will allow us to design and test this new form of data collection, leading to a more transparent and meaningful relationship between you and the gallery.

There is always a minor risk that data collected may identify you in research reports and publications, although every possible step will be taken to avoid this. Your name will not be associated with any data, transcripts will be fully anonymised, and audio or video collected will not be shared beyond the project team.

Use of your data.

Your data will be used in supervision sessions and project reports for the purposes of the research. It will be anonymised and disseminated in the final PhD thesis, and may be presented at conferences, or as publications stored online and on databases.

Future use of your data.

Your anonymised data may be archived and reused in future for purposes that are in the public interest, or for historical, scientific or statistical purposes. Archiving anonymised data allows future research to be carried out more effectively. Your data will be stored on secure University of Nottingham servers that are password protected.

Procedure for withdrawal from the research.

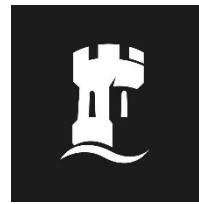
You may withdraw from the study at any time and do not have to give reasons for why you no longer want to take part. If you wish to withdraw please contact the researcher who gathered the data at harriet.cameron@nottingham.ac.uk. If you receive no response from the researcher, please contact the School of Computer Science's Ethics Committee.

Contact details of the ethics committee.

If you wish to file a complaint or exercise your rights you can contact the Ethics Committee at the following address: cs-ethicsadmin@cs.nott.ac.uk

²³ Mural is an online, collaborative software that allows us to work together on a shared document. It is fully GDPR compliant, and their privacy policy can be found here - <https://www.mural.co/terms/privacy-policy> If you have any further questions about Mural, please email me.

CONSENT FORM



University of
Nottingham
UK | CHINA | MALAYSIA

Date: February-May 2021

Project: Curating the Audience PhD Project

School of Computer Science Ethics Reference: CS-2020-R31

Funded by: Horizon CDT UKRI Grant No. EP/L015463/1

Please tick the appropriate boxes

Yes No

1. Taking part in the study

- | | | |
|--|--------------------------|--------------------------|
| a) I have read and understood the project information sheet dated 1 st March 2021, or it has been read to me. I have been able to ask questions about the study and my questions have been answered satisfactorily. | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason and that my data will subsequently be removed from the research study. | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I understand that taking part in the study requires me to provide data and that this will involve audio recordings of interviews, some basic demographic/personal data, and screenshots and/or footage of shared computer displays that may include my visual image | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I understand that a third party website will be used for data collection (Mural) and agree to the use of this programme | <input type="checkbox"/> | <input type="checkbox"/> |

2. Use of my data in the study

- | | | |
|---|--------------------------|--------------------------|
| a) I give permission for my visual image contained in photos or video gathered during the research to be used for the purposes described below. | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I understand that all other data that can identify me will not be shared beyond the project team. | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I agree that the data provided by me may be used for the following purposes: | | |

- Presentation and discussion of the project and its results in research activities (e.g. in supervision sessions, project meetings, conferences).
 - Publications and reports, including a PhD thesis describing the project and its results.
 - Dissemination of the project and its results, including publication of data on web pages and databases.
- d) I understand that only quotes taken from transcriptions will be made publicly available and that any audio recordings made will not be shared publicly
- e) I give permission for my words to be quoted for the purposes described above.

Please tick the appropriate boxes **Yes** **No**

3. Reuse of my data

- a) I give permission for the data that I provide to be reused for the sole purposes of future research and learning.
- b) I understand and agree that this may involve depositing my data in a data repository, which may be accessed by other researchers

4. Security of my data

- a) I understand that safeguards will be put in place to protect my identity and my data during the research, and if my data is kept for future use.
- b) I confirm that a copy of these safeguards has been given to me in the University's privacy notice, and that they have been described to me and are acceptable to me.
- c) I understand that no computer system is completely secure and that there is a risk that a third party could obtain a copy of my data.

5. Copyright

- a) I give permission for data gathered during this project to be used, copied, excerpted, annotated, displayed and distributed for the purposes to which I have consented.

6. Signatures (sign as appropriate)

Name of participant (IN CAPITALS)	Electronic Signature*	Date

*If you are unable to provide an electronic signature: Please simply retype your name in the electronic signature box. By typing your name in the signature box, you agree that this applies as the equivalent of physically signing your agreement to participate in the study.

I have accurately read out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Name of researcher (IN CAPITALS)

Electronic Signature

Date

7. Researcher's contact details

Name: Harriet Cameron

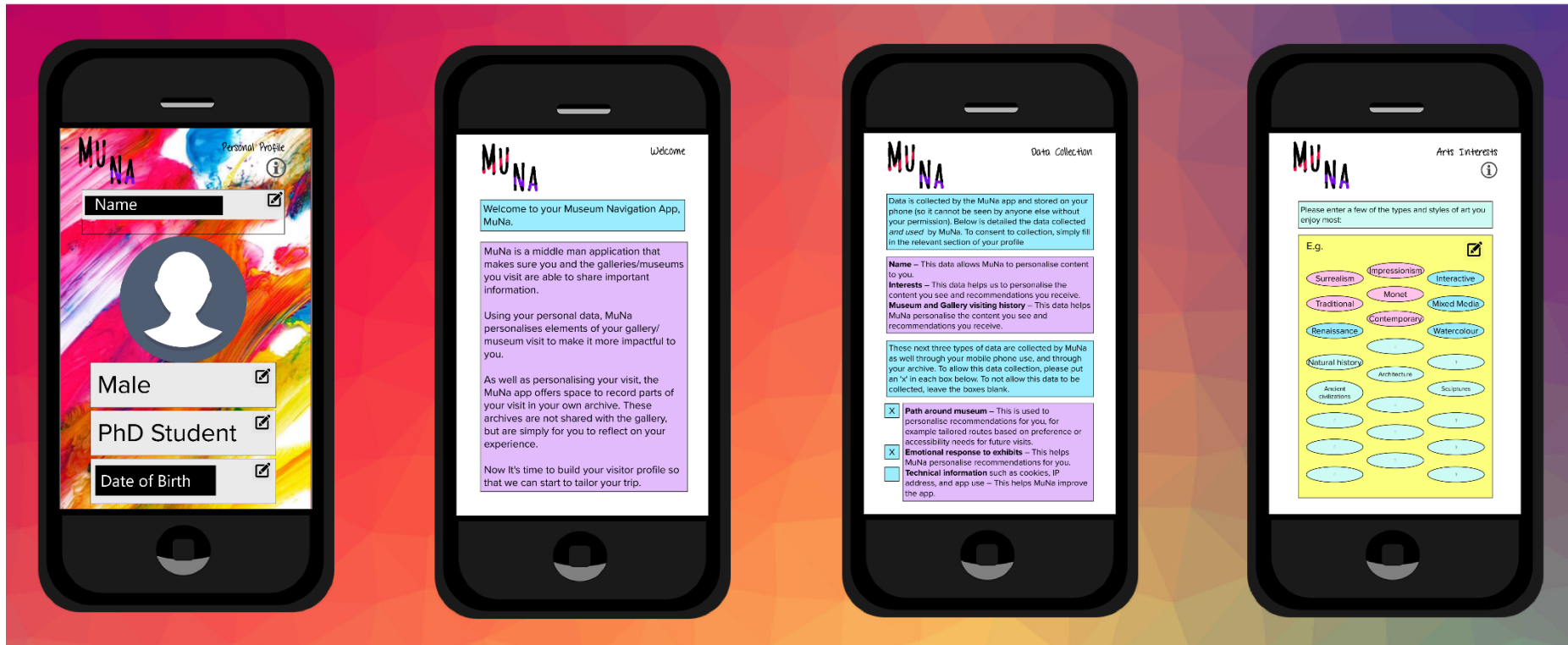
Email: harriet.cameron@nottingham.ac.uk

Supervisor: Prof. Boriana Koleva

Email: pszbnk@exmail.nottingham.ac.uk

Appendix Six – MuNa Examples

Arthur's MuNa Profile





Archive

Still Undead - Popular Culture in Britain Beyond the Bauhaus

Nottingham Contemporary - Nottingham, UK
 Exhibition Dates: September 2019 - January 2020
 Visited: March 2021

MUNA

Rita Donagh
1971
'Reflection on Three Weeks in May 1970'

I don't please me, and I don't know why. It just does.

MUNA

Richard Hamilton
1954
'Transition III'

MUNA

Stephen Willats
1991
'New Directions'

To buy. Need it in my life. I don't understand what's going on with the head piece. Very cool sci-fi. I love it.

MUNA

Just stunning. I don't know why. It's the extra eye. Just incredible.

Leigh Bowery and Fat Gill as 'Miss Fuckit' at the Alternative Miss World, 1985

MUNA

Anton Corbijn
1982
Fad Gadget - Frank Tovey
Album Art

I like this as well. I don't know what it is. Don't know what I'm looking at.

MUNA

Charles Atlas
1992
'Mrs. Peanuts Visits New York'

I hate it, thanks. It's the leg for me. Mrs Peanuts lives with me forever now.

MUNA

David Montgomery
1964
'The Five Point Cut - Vidal Sassoon'

Model: Grace Coddington

Gifted to MuNa
Friend: Aunt

MUNA

Total visit length: 55min 41sec

Total time spent looking at art: 43min 59sec

Average time spent at one point: 34sec

Art pieces visited: 58
 Videos watched: 28
 Information points read: 4

MUNA

Longest time at an art piece: 'New Directions' by Stephen Willats 1991 (1min 45sec)

Longest time watching a video: Bauhaus by Bela Lugosi's Dead 1982 (3min 58sec)

Longest engagement with an information point: Still Undead: Popular Culture in Britain Beyond the Bauhaus (36sec)

Profile updates:

Interests: +photography
 +minimalism
 +abstract
 +lgbtq+

Behaviour: +most interesting content preferred in first 15 minutes
 +share specific content with specific recipients
 +most engaged with videos
 -less likely to read information signs

Other: +mode of transport car
 +likely to visit cafe/gift shop

