ACT OTHERWISE
THE INVISIBLE HAND: ON PROFILING AND PERSONALISATOIN
Insight Report

2014

Every individual neither intends to promote the public interest, nor knows how much he is promoting it ... he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention."
--- Adam Smith, The Wealth Of Nations (Book IV, Chapter II, p. 456, para. 9.).

Introduction

Act Otherwise is an annual and intimate discussion hosted by Brighton based arts group *Blast Theory*. At Act Otherwise in 2013 participants shared about the ethical implications of artistic work and practices. In 2014 with the provocative title *The Invisible Hand* inspired by the Adam Smith quote that describes the self-regulating behaviour of the marketplace, the group turned their focus to the cultural implications of profiling and personalisation.

"The discourse around data has become a very public issue through recent events, such as whistle blower Edward Snowdon and discussions around how social media sites such as Facebook use the data they collect on us. We have had a long time interest in the development of big data and its cultural implications." Matt Adams, artist and co-founder at *Blast Theory* introduced.

"Through project presentations, conversations, and small group discussions we are going to do a broad sweep covering consumerism, surveillance, activism, and democracy vs. corporatism." Matt said. "The critical question we want to consider throughout this event is 'what are the cultural implications of profiling and personalisation? What does it mean for the arts community?"

For two full days, *Blast Theory* brought together over 40 artists, researchers, designers and developers[1] to discuss in the open forum how people are navigating the world of big data, profiling and personalisation and what this means for them, their work and arts practice. The hope was ultimately for the group to walk away with at least 10 principles around profiling and personalisation.

[1] A full participant list is included in Appendix A.

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1 | Starting the Conversation

To set the scene and start the conversation, Matt shared with the group a number of examples of work, which explore ideas around big data, profiling and personalisation in different ways. Work in which profiling systems in the background shape either 'who' or 'how' of your experience.

"These works we felt responded to the theme of the two days." He explained (Exhibit1).

Exhibit 1. Cultural Experiences Shaped by Profiling or Personalisation Systems

Artists	Work	Description	Visual
Allan Kaprow	*18 Happenings in 6 parts (1959)*	"In his ground-breaking happening, presented at the Reuben Gallery in New York in the fall of 1959, Kaprow synthesised his training in action painting with his study of Cage's scored and performed events. Working from a carefully conceived and tightly scripted score, he created an interactive environment that manipulated the audience to a degree virtually unprecedented in 20th century art." (Source: Medienkunstnetz)	
The Neo-futurists	*Too Much Light Makes The Baby Go Blind (1988)*	"The show consists of 30 short plays performed in a 60 minute space, written, directed, and performed by a small ensemble called the Neo-Futurists. The plays tend to be a mixture of autobiography and performance art." The work Has interesting, playful attitude - how audience are dynamic in piece of work. (Source: Too Much Light)	
Lev Manovich	*Soft Cinema (1994)*	Soft cinema is database of film works organised in real time. "Soft Cinema project is designed to take a number of forms, including different movie editions, installation versions, and publications. Each edition movie presents different narratives and uses different media databases." (Source: Soft Cinema)	

Chris Milk	*The Wilderness Downtown (2010)*	"Is an interactive multimedia video coded in HTML5 and was published to show off the capabilities of the new Google Chrome browser … it features the We Used to Wait song from the Arcade Fire album The Suburbs. It was one of three Grand Prix winners at the 2011 Cannes advertising awards in the Cyber category." (Source: Wilderness Downtown)	
Blast Theory	*A Machine To See With (2010)*	"It is a film where you play the lead. You sign up online and hand over your mobile phone number. On the day, you receive an automated call giving you the address you need to go to. Once you arrive on your allotted street corner your phone rings. From there a series of instructions lead you through the city. You are the lead in a heist movie; it's all about you. As you move from hiding money inside a public lavatory, to meeting up with a partner in crime and onwards to the bank, the tension rises. It's up to you to deal with the bank robbery and it's aftermath." (Source: A Machine To See With)	

Source: Matt Adams (February, 2014).

During his presentation, Matt also mentioned interactive theatre-makers *Coney*, and *non zero one* as well as Leeds-based artists *Invisible Flock*, all of whom produce adaptive work. It was during the making of *A Machine To See With*, that Matt came across the book, *59 Seconds* by Richard Wiseman and he read the chapter on personality profiling. This coupled with learning from many *Blast Theory* projects led the team to shape a new piece of work that draws heavily on profiling, personalisation and the practices surrounding big data. This new work --- *Karen*, has inspired Blast Theory to consider the meaning and practices of personalisation, and profiling and to explore Big Data as shaping cultural work.

Matt then opened the conversation to participants stating that, "We hear fiction descriptions of buying products informed by our data, where data is the product, however companies like Zara (Inditex) have already done that." In fact, research tells us that cloud computing and big data analytics is making Zara the quickest product producer of top trends in affordable fashion (Exhibit 2).

Exhibit 2. Zara: A Fashion Empire Built on Data and Cloud Computing

ZARA	Zara is a fashion empire built on an unconventional idea: speed and responsiveness are more important than cost. The company produces about 450 million items a year for its 1,770 stores in 86 countries. To achieve this Zara looks at and analyses current fashion trends, creates a collection, and then only ships a few of each item to their stores. This leaves little left on the shelves, so there is low risk if the trend doesn't turn out the way they hoped. The store managers and employees are trained to talk to customers to find out what they like and don't like about the design. Using

cloud computing this data is then sent to headquarters in Arteixo, Spain and to the designers. The designers revisit their designs, repeat the process and send the final draft to the different manufacturers. Within weeks a new updated product is on the shelves in Zara owned stores. The only difference between Zara and a competitor is Zara has their new product in the stores in 3 weeks, compared to 9 months for a store like Gap. They make decisions based on the data they have all in real time. Daily sales numbers, delivered to systems using cloud computing, show the designers what and what isn't selling.
Source: Lindsey Nelson, (2013) and Berfield and Manuel (2013).

A conversation started about the value of data in profiling, and how companies are using profiling to aid decision-making in the provision of services, especially in financial services and health care. The notion of the financial value of profiling dominated the discussion.

"Some literature talks about how there are costs and benefits." (Nina Reynolds).

"A lack of awareness makes it sinister." (Anon.).

"Banks are not offering services to certain types of people, as they are not the customers they want" (Nina Reynolds).

"Customers mobile for the best deal are active in their loyalty or not." (Paul Dungworth).

"Idea of profiling is done to make a profit - we're talking about this is terms of money. Is profiling only used for money?" (Anon.).

"Everything comes back to cash --- NHS." (Adam Sporne).

"It is also used to save people." (Nina Reynolds).

The conversation moved into the ownership of data collected and shared and the nature and transparency of this exchange. The motives of who collects it, and the politics used to rationalise it. Some participants shared that 'it is all about the money' while others dug deeper into motives for profiling activities.

"It is my data which I should be able to offer to some companies with some reward. I should be about my personal data and me being able to ownership of profiling and data." (Martin Flintham)

"We know how this is being sold. We don't know about is to whom, how and how often. "Money is the exchange which allows us to do things. We see it as this evil thing." (Nina Reynolds). Nina made a comparison between the US and UK health systems and the social values that underscore how they differ. The UK being founded on the premises that 'everyone deserves treatment' while in contrast a user-pays system.

"Political motives, people saving phone numbers but then saying they aren't keeping names with them." (Alex Peckham)

"It is about waste too - time and energy and mortal and individual, can only get so much and go so far." (Ju Row Farr)

The discussion evolved as participants started to share what all this means in a social context. Matt Adams introduced the notion of 'data at a social level' providing for a discussion into the way we think about the social or cultural implications of data.

Tony White shared with the group that we also need to consider how data is also used to depersonalise individuals. "[We] need to consider the issue with people from migrant communities in Australia being put into offshore detention centres and how depersonalisation is used to mask deaths." Tony shared a story about an architect who was detained on Manus

Island. He also shared another example wherein, "… depersonalisation is also used to strip non US citizens of access to the legal process and human rights."

Kate Genevieve shared about a project *Gather*, and her work on and around science, exploring sensing and consciousness, reactions to environments we are not even aware of. While having to get involved with financial interests and its application to commercial context, Kate attests that this sort of profiling allows for 'senses to sense us' and get reactions to products which happen on subconscious level.

Liz Whitehead shared about the notion of 'collective of curiosity' in the context of an art gallery experience, and developing an interpretive model from lots of people in the room. "For a development day for artists we asked, 'what do people want to know when they come in' and lots of people said 'they didn't want an artists statement [next to a work], people should come to work as it is'." She concludes that we need to take responsibility in our giving of information in society.

A final theme to emerge from the discussion was the dominant rhetoric around profiling 'making things better' and a drive for 'efficiency' as well as the assumptions and imperfections inherent in the practice of profiling.

There is the "Idea that because it's market led that there is a you, if you feed them [systems] you will be making better choices." (Anon.)

"You can lie about your profile." (Dominic Shaw).

"There is an assumption that we [people] have common ways of developing. People are grouped by commonalities. For example an undergraduate student while not attractive to a financial institution as a student if we keep you you're more likely to earn more money later." (Nina Reynolds).

"There is an assumption that as people we don't think and feel differently. To what degree are we making too many assumptions when we profile?" (Kelly Page).

"It is easier for society to sell 'dieting' then make jeans which look good Corporations are selling us services we want, and would be more likely to do the latter perhaps if demand was there." Matthew went on to ask the question as to whether something like Mosaic [a system for classification of UK households based on geodemographic segmentation] is bad? "Isn't it good if you can get a better service through profiling systems like this?" (Matthew Tyler-Jones).

"This down to what we measure in society? If companies did same thing, happiness index, then would people be looking at how they can make life look better? If Mosaic can help charity get better at stuff then why not!" (Nina Reynolds) Nina shard about how the Royal Society for the Protection of Birds (RSPB) have discovered customer's values are linked more to it being a family day out rather than about the birds. By getting information they then could make it a better customer experience."

"We're talking a lot about it getting 'better.'" (Aste Amundsen).

During this session of *Act Otherwise: The Invisible Hand*, participants began to share how people approach, perceive and participate in profiling and personalisation activities, sometimes without realising it and enacted by different actors. The group also touched on the discourse of efficiencies, and the value --- financial and nonfinancial, often afforded big data practices and the imperfections and assumptions inherent in its practice.

2 | Big Data, Profiling and Personalisation: Making Sense from Literature

For the second session Nina Reynolds (Southampton University) shared with the group what she discovered from a review of the academic literature on Big Data, personalisation and profiling.

What do we know about Big Data?

Leading scholars in the field of the Internet and society, dana boyd and Kate Crawford in 2012 published a seminal piece of research titled *Critical Questions for Big Data*. In this work boyd & Crawford (2012) review the literature on big data and present a valuable approach in which to consider the phenomena stating: 'Big Data is a cultural, technological and scholarly phenomenon that rests on the interplay of (p.663):

(1) *Technology:* maximising computational power and algorithmic accuracy to gather, analyse, link, and compare large data sets.
(2) *Analysis:* drawing on large data sets to identify patterns in order to make economic, social, technical, and legal claims.
(3) *Mythology:* the widespread belief that large data sets offer a higher form of intelligence and knowledge that can generate insights that were previously impossible, with the aura of truth, objectivity, and accuracy'

The authors further attest that: 'Big data is less about data that is big than it is about the capacity to search, aggregate, and cross-reference large data sets (boyd & Crawford, 2012, p.663). While not exhaustive a useful classification of the different methods for analysing Big Data was published by Chen and colleagues (Exhibit 3), who refer to the three V's of Big Data – volume, velocity, variety (Chen et al., 2012).

Exhibit 3. Methods of Big Data Analysis

Method	Description
Data Analytics	Data mining & statistical analysis --- clustering and genetic algorithms for optimisation, machine learning, multivariate statistics, optimization techniques.
Text Analytics	Unstructured content in textual format – roots in information retrieval and computational linguistics.
Web Analytics	Website crawling/spidering, website ranking, search log analysis, web log analysis.
Network Analytics	Evolved from citation-based bibliometric analysis – network metrics, topology, network properties and relationships, link mining.
Mobile Analytics	Elements of others, but also location-based analytics.

Source: Chen et al., (2012)

What are the issues and concerns about Big Data?

Consent, harm, privacy and data security are four general issues often raised in discussions of data. To provide deeper context, Nina presented a review of the specific points made by boyd and Crawford (2012) as to what are the key issues and concerns we face specifically with Big Data (Exhibit 4).

Exhibit 4. Issues/Concerns about Big Data

Issue/Concern	Description
Big data changes the definition of knowledge	Very large data sets, but also tools/procedures to manipulate and analyse them; changing the objects of knowledge, power to inform how we understand human networks and community; reframes key questions about what the constitution of knowledge, processes of research, how we engage with information, nature and categorisation of reality. Do numbers speak for themselves? Tools/processes have own inbuilt limitations.
Bigger data are not always better data	What makes work rigorous is systematic approach to data collection and analysis – just because large quantities of data are used, does not mean methodological issues are not relevant; big data and whole data not the same; hard to understand sample when source is uncertain; *"When researchers approach a data set, they need to understand – and publicly account for – not only the limits of the data set, but also the limits of which questions they can ask of the data set and what interpretative actions are appropriate";* combining data from multiple sources creates unique challenges; small data can also be extremely valuable.
Claims to objectivity and accuracy are misleading	Consider what is and what is not quantifiable knowledge in the social domain – *"Claims to objectivity suggest an adherence to the sphere of objects, to things as they exist in and for themselves"* – claims to objectivity are made by subjects and based on subjective observations and choices; choices concerning what is data are subjective/interpretative in nature; not all numbers are neutral; need to understand the properties and limits of the data set regardless of its size; possibility of seeing patterns where none exist.
Just because it is accessible does not mean its ethical	What is 'public' data? How can informed consent to use data be obtained? *"To act ethically, it is important that researchers reflect on the importance of accountability; bot to the field of research and to the research subjects";* accountability to superiors, colleagues, participants, public; Questions of truth, control, and power; people *"are not necessarily aware of all the multiple uses, profits, and other gains that come from information they have posted." "considerable difference between being in public (i.e., sitting in a park) and being public (i.e., actively courting attention)*."
Limited access to Big Data creates new digital divides	Who gets access? For what purposes? In what contexts? And with what constraints? *"Some companies restrict access to their data entirely; others sell the privilege of access for a fee; and others offer small data sets to university-based researchers."*… Unevenness in the system; question of skills… who is asking the questions determine which questions are asked.
Taken out of context, Big Data loses its meaning	Relations displayed by social media are not necessarily equivalent to relationship consider in the physical world (e.g., kinship networks) – e.g., strength as well as existence of ties matters; connections (articulated networks) and connecting (behavioural networks), neither are equivalent to personal networks (sets of relationships that individuals develop and maintain).

Source: boyd and Crawford (2012)

What does Big Data have to do with Profiling?

A general understanding of profiling is 'the use of personal characteristics or behaviour patterns to make generalisations about a person' such as racial, age, gender or geographical profiling. Profiling can occur in a number of contexts and doesn't always involve Big Data or computing technology. However with the rise in large datasets, advanced computational power and the development of techniques over the last 20 years to analyse them, we are witness to the rise in the practice of more automated and large scales forms of profiling.

During this session Nina shared a definition of profiling by King and Jessen, (2010, Part I) that in light of these developments states: "profiling is an automatic data processing technique that consists of applying a 'profile' to an individual … to take decisions concerning him or her; or

for analysing or predicting personal preferences, behaviours and attitudes." In business consumer profiling is increasingly common and 'used to improve customer experience, target marketing campaigns, sold on as a source of revenue' (Thomann and Wells, 2013). It is also a practice used in recruitment, social work and health services as well as for the delivery of government services.

What does Big Data and Profiling have to do with Personalisation?

When something is 'personalised' someone else tailors it for you, according to your needs, interests and identity; it is the application of design to individual requirements. Consider the baking of a favourite cake for a friend's birthday, the tailoring of a suite, or the addressing of an envelope with the receivers first and last name as acts of personalisation.

As shared by Nina, within an organisational context, "personalisation is the tailoring of certain offerings by providers to consumers based on knowledge about them, with certain goal(s) in mind" (Adomavicius and Tuzhilin, 2005; p84). While this can occur without access to Big Data or digital technology (e.g., tailor tailoring a suite), with the rise in these phenomena we are seeing a rise in personalisation as an organisational practice with the aim to offer more personalised goods and services to groups of individuals (and in some cases individuals) across society. For example Tesco has long collected data on customer buying behaviour and uses this data to segment shoppers into different groups (profiling them). The company then delivers different offerings and incentives based on the characteristics of the group to which individuals have been classified (personalising offering to the group). In educational contexts 'personalised learning' is system of learning tailored for or by the learner with technology used to facilitate it.

When factoring in large consumer or citizen groups, for this form of personalisation to be successful however, 'depends on knowledge about personal preferences and behaviour typically distilled from volumes of granular information about them and stored in the form of consumer profiles' (Adomavicius and Tuzhilin, 2005). As such, in some contexts for personalisation to occur, the profiling of people is required from data stored in large datasets (e.g., website service and/or content delivery).

What are the issues and concerns about Profiling and Personalisation?

To close this session, Nina reviewed some of the issues and concerns raised in the academic literature about the practice of profiling and personalisation (Exhibit 5).

Exhibit. 5. Issues/Concerns about Big Data

Issue/Concern
Data security concerns (e.g., identity theft, fraud)
Interference with consumers' rights of personal data protection (right to notice and to give consent)
Pervasive and non-transparent commercial observation
Increased generation of unwanted commercial solicitations
Increased exposure to potential types of unfair commercial practices (e.g., price discriminations)
Fairness of process
Fairness of outcomes
Perceptions of accuracy
Primary versus secondary data use, ownership and how authorises additional use
Unintended and uncontemplated use of the information
Conflict with concerns of data privacy, security, anonymity, and ownership.
Need to better define sensitive data and regulate the creation and use of sensitive profiles.
Right to be forgotten

Source: King & Jessen, (2010, Part I, Part II); Spangler et al., (2006); Culnan, (1993); Lemon, (2007)

In review of the issues and concerns about these data practices, a series of questions about 'fair practices' for the group to consider were raised from this presentation. These included:

- Is it fair that you can use my data without my knowledge?
- Is it fair that I might be charged more than someone else?
- What about issue of people selling on our data?
- Who has true ownership of my data?
- Should you have the right to say my data is old?
- Do you have a right to be forgotten?

One of the themes to emerge during the discussion was about people's awareness of and access to information about how data in large data sets is collected, analysed and used, and by whom. For many participants this highlighted inherent issues around inequalities.

"Big data assumptions about future things are not necessarily things which people would have access to. A stranger knows more about you than you know about yourself." (Matthew Tyler-Jones)

Anne Nigten shared with the group about the recent panel that took place at Transmediale in Berlin, *Circumventing the Panopticon: Whistle-blowing, Cypherpunk and Journalism in the Networked 5th Estate* (Exhibit 6). The panel featured NSA whistleblower Bill Binney, former intelligence officer for MI5 and whistle blower Annie Machon,Chelsea Manning rapporteur Alexa O'Brian, and activist Diani Barreto. "This [panel] discussed around a national/ international governmental level but I think this goes all the way. We don't know what kind of traces we leave and what's happening with that." (Anne Nigten).

"The notion of ephemerality, what role does this play in things? (Marina Jirotka).

Exhibit 6. Circumventing the Panopticon: Whistle-blowing, Cypherpunk and Journalism in the Networked 5th Estate [2 hour Video]

"Whistle-blowing is the new civil disobedience of our time." Bruce Schneier. The recent disclosures made by whistle-blower Edward J. Snowden encompass some of the most severe threats to Human Rights and to democracy in the modern age. We are experiencing a "chill" in the fields of investigative reporting while witnessing an unholy alliance between government agencies, Internet service providers and the media, that have caused a rupture of confidence in the security industry as well as in our civic institutions. The Snowden affair has also shed light on how journalism is being perceived in our time and how information contained in the leaks is being handled by the media outlets of the 4th Estate, which have traditionally served as the "gatekeepers" for public accountability.

This panel seeks to illustrate how the virtue ethics of cypherpunk, whistle blowing and investigative journalism are evolving into a hybrid form of civic resistance against the predations of the State. It will discuss the ascendancy of an information commons, a so-called 5th Estate, as a network of networks that can serve to complement, if not surpass the 4th Estate and how it can serve to effectuate political change.

Source: Transmediale (February 2nd, 2014) https://www.youtube.com/watch?v=6qxU1voSEDA

The discussion moved into a debate about power and agency, how actors in the system interact. Tensions between different ideologies of knowledge that is inherent in the discourse around Big Data, profiling and personalisation also emerged. The approaches discussed slipped between the transactional model of knowledge as tangible to be collected, as currency, as exchange, used to predict/determine (e.g., management science view) and the cultural model of knowledge as shared and socially constructed, as negotiated, as meaning making (e.g., an anthropological and artist view).

"To what degree are we discussing the nature of power? Nature of who can act and feels they can act? Corporations feel they can act until they're told they can't. We are talking a lot about being acted upon. We're talking about data and knowledge wherein the anthropological view knowledge has effect. There is a difference between, data, knowledge and meaning. A lot of what we do as artists is about meaning making." (Giles Lane).

"Can you think of a situation where people can fool the system?" (Barbara Gorayska)

"It relies on you knowing what you're looking at. In the technology literature, we have all this information but how you create knowledge in way that creates an effect that allows you to segment and predict behaviour. Is this just making it more convenient for us to enact behaviours we would anyway. The danger is we become data points rather than humans." (Nina Reynolds)

"I believe knowledge is socially constructed, not transactional BUT it does seem to be used as transactional. How do we eject ephemerality into these processes? Peoples knowledge changes from year to year and generation to generation." (Giles Lane)

The final theme to emerge was a call to critique the analytical practices used to make sense of Big Data and their assumptions; a need to also push the boundaries of our understanding of the methodologies emerging from across different fields, that could aid making sense of its social implications.

"We've got to look at weaknesses as to the methodology around Big Data practices" (Kelly Page)

"Researches are starting to look at how to make sense of it through qualitative work around this and the data." (Marina Jirotka).

"Technology for collection of data has outstripped ways to analyse it. In 20 years we will have the technology to mine this data." (Alex Peckham).

"We can't just wait 20 years to mine this data." (Nathaniel Slade).

"There are many ways of making sense of this. What other patterns are in this data, make meaning from it rather than just to predict." (Kelly Page).

"These things have to be learned (ways of embedding) such as visualisations in science. Computational Biology."(Marina Jirotka)

"Magnetic resonance imaging measures electrical activity in the brain. This has been huge in medicine for 20 years, but contentious in cybernetic and cognitive research." (Giles Lane)

"This is not science, MRI's light up bits of brains when things happening. We are making assumptions. It works to a degree but there are unanswered questions about why it works." (Egor Alexander)

During this session of *Act Otherwise: The Invisible Hand*, participants shared different understandings of the assumptions and practices for making sense from Big Data with issues of 'trace awareness' and 'informed consent' inequalities featuring in light of recent civic human rights infringements (e.g., Snowdon, Manning). Tensions between ideologies further dominated the discussion. Matt referred to this as a 'battled of models' --- in how different models influence and inform the discourse and our technical, analytical and social literacies.

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3 | BabyCenter®: Metric Prioritised Content

Carina Westling (University of Sussex) shared her experience working as editor of BabyCenter® Sweden where she was responsible for digital content production, and her reflections as a researcher in media and cultural studies exploring engagement as an embodied phenomenon. Carina shared with us her reflections on how the organisation makes use of data collected from expectant parents and parents such as pregnancy due dates and child ages to personalise their experience. Personalisation is BabyCenter's main strategy founded on parents having different concerns at different stages of pregnancy and a child's development (Exhibit 7).

Carina shared, how techniques used in theatre are used in commercial ways too, referring to the 'suspension of disbelief' --- participants need just enough information to remain engaged and interested, but not too much or little that they become alienated.

"Baby Center is trying create an 'advertising friendly environment'" she explained "by collecting different types of user data added to a biological timeline and through different 'brand touch points' content is tailored to a parents interests and needs." "A whole platform approach through audio delivery where people aren't literate or a mobile phone where there might not be web access helps to build engagement."

Exhibit 7. Site Registration Key to Personalisation

BabyCenter® is the #1 parenting and pregnancy digital resource. It reaches 39 million mothers globally each month in 11 different languages. The digital publisher reaches 1 in 5 new and expecting mothers online throughout the world. BabyCenter is also the most recommended and most trusted pregnancy and parenting website among mothers.

BabyCenter has long realised success in the competitive parenting market required more than a lot of content and a motivated audience. In April 2000, BabyCenter decided to give more impact to the site's content by making it highly personalised. BabyCenter's in-house tech team created a new proprietary personalisation platform, built upon a general application server that includes three distinct components:

a. An authoring tool allows editors to create content for BabyCenter's website, store, and newsletters and to specify the precise audience (pregnant women or mothers with a child of a certain age) for each article and each product.
b. Site personalisation technology automatically tailors the site's content while a visitor is browsing; in order to display related articles and product offers to the right person at the right time.
c. A marketing tool delivers extremely targeted offers for BabyCenter store items to each registered email newsletter subscriber, based on their stated preferences, as well as their shopping histories with the site.

Although the site uses cookies to track visitors' paths and then display related content, the BabyCenter team knew their personalisation technology would have a much greater impact if they could get visitors to register. Therefore the site's design is built around getting that registration, first and foremost. With just a few moments to register with BabyCenter, users are rewarded with free, personalised emails written especially for their stage of pregnancy or your baby's age. This helps the site offer broader and deeper content than any of its competitors.

Source: Zarem, (2002); BabyCenter (2014)

Carina's presentation sparked a conversation about a parent's awareness of the information the organisation collects as they participate and how the information is used. Marina Jirotka posed the question to the group that, "With relation to responsible innovation should people know there is someone there listening?"

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4 | Learning about the Rise in Behavioural Profiling

Kelly Page (Columbia College Chicago) presented her journey learning about the rise of behavioural profiling since the development of databases, web and social technologies, and the limitations of self-report surveys of behaviour (Page, *et al*., 2014). She also reflected on the practices of different organisations that have set the tone for management practices of behavioural data, companies such as DoubleClick, Google and Tesco.

At the outset Kelly suggested it is important to consider the following in conversations about Big Data, Profiling and Personalisation: a) what does the data purport to represent or indicate (Exhibit 8), b) how is it collected and c) how is it shared, with who and why. This information provides for a rich context about the data, the methods used to make meaning from it, as well as its perceived value.

Exhibit 8. What the data collected purports to represent or indicate

Indicates	Description	Examples
Behavioural	How a person acts or behaves.	Product or media usage, purchase, travel
Psychological	A person's beliefs, values, feelings and emotions	Attitudes, emotions, perceptions
Physiological	How the human body responds	Body temperature, heart rate
Biological	How the human body is designed	DNA, blood type
Demographic	Subset population characteristics	Age, sex
Geographic	Where a person is located, lives or travels	Location, address
Profile	Unique profile identifiers	Name, SSN/TFN, passport number

In Kelly's presentation she shared four different examples of the use of profiling from behavioural data collected through advances in database, scanner, web serving (e.g., web site log file data, cookies etc.) and social technologies (e.g., Twitter)(Exhibit 9).

Exhibit 9. Behavioural profiling case insights

Case	Description	Collection
Tesco &	In early 1990's Tesco partnered with Dunnhumby to develop network	Store

Dunnhumby	integration of: store inventory, customer purchase, customer profile data using 'loyalty incentive system'. Today called 'customer science', the profiles developed inform communications, store-layout, inventory and indicator for individual and household purchasing trends. Dunnhumby (now owned by Tesco) one of the leading customer science companies in the world.	Loyalty Card
DoubleClick & Google	In late 1990's DoubleClick was an early innovator in website behaviour monitoring and anonymous profiling. In 2007, Google acquired DoubleClick (and their data) for US $3.1 billion. Profiling system informed Google Adwords and today it stands as the most powerful ad-serving and web user profiling system in the world.	Website log file and cookies
Mevoked (Child App)	Mevoked is an analytics platform that uses mobile, online and social data to collect data on and profile needs in mental health. Monitors child online behaviour and provided 'wellness' alerts to parents about 'at risk' behaviour.	Web, mobile and social
Twitter, Haiti and the London Riots	Developments in profiling large datasets of tweets shared during crisis and relief efforts (e.g., Haiti earthquake and London riots) are providing insight and meaning into social behaviour through rudimentary techniques.	Micro-blogging

"What we do tells people more about us than what we say we'll do," Kelly shared. "We have long known from small survey studies that self-reporting of behaviour includes much error. With the rise in databases, scanner web and social technologies has emerged a field of science of profiling based on 'monitoring actual behaviour'." Kelly shared that she has come to explore data practices and management culture around it. "There is a culture of certainty with data, a lack of awareness of ethics in its collection and in how it is shared with others. As researchers we also play a role. We create meaning in how we analyse and present data."

Kelly also touched on the role of people being monitored. "We are not always passive. We are active participants (e.g., using the Tesco clubcard, sharing on social media) and as much as we hate to admit it we play an active role in our own profiling." Kelly shared from an article published in *The Guardian*, which refers to mobile data as the 'oil of the digital age' especially in emerging markets and to reach/profile young people. She closed the session by highlighting the need for us to critique not just profiling as a Big Data practice, but also the management and scientific research practices within which behavioural profiling lives

A theme to emerge from the discussion for this session was about the role of science and academic rigour in the knowledge of profiling and personalisation as compared to management practices of companies. Who are the actors in the system we can learn from? Where are artists in this?

Marina Jirotka mentioned Harry Collins new book, *'Are we all scientific experts now'* and Roger Burrows discussion on the death of social science as companies are doing research much quicker. "To counter the argument we have methodologies, we have a way to look at specific types of data and companies are not adopting this." Marina explained.

"I'd agree. I'd also argue that when looking at profiling and personalisation there a lot of advances coming from government and corporate projects, and we need to be more open at how we consider the scientific method in these contexts." (Kelly Page)

A second theme to emerge from the discussion was about the ethics, assumptions and impact of profiling complex and sensitive issues such as mental health from their behaviour (e.g., Mevoked). What is the responsibility and accountability of how is the system devised?

"This came in after brining in psychological profiling. Something tracking behaviour and then here something in between doing psychological analysis from website use?" (John McGrath)

"It observes sites accessed and makes assumptions as to mood and impact on the child's mental health. Through a dashboard parents can view content flagged for sexual, violent, or other inappropriate material and see a link to the source." (Kelly Page)

"John is looking at ethically but also there is something about how the system is devised." (Adam).

"There can be dire consequences if the analysis is wrong. Kelly showing this as example of something commercially marketed. Collecting our data but we're not guided socially on how to use this." (Barbara Gorayska).

"When psychiatrics analyse people they know how to. Problem with this is that it's just algorithms." (Alex Peckham)

A final theme was about what is going on behind the scenes to learn how are companies experimenting with data and profiling that could have social implications if shared more openly

"All this profiling is observational. What interests him is what is happening experimentally behind the scenes. A lot of games companies are doing experimental work but not sharing it, like universities would. What we see shared is observational data." (Matt Adams)

"We also often miss the richness and messiness in conversations and interactions in large datasets. Seeing data as an end result rather than journey." (Kelly Page).

"In the 1990s at conferences with art, artists didn't like the Internet and were snobby about it. Even into this century some people didn't email." To close this session Matt encouraged participants to always think both ways in terms of impact. He encouraged participants to consider, "What if we looked at Mevoked as a tool to help teenagers at risk. What then?"

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5 | Spectator Crowdsourcing: Telling a Story Around a Marathon

Martin Flintham (University of Nottingham) shared his learning about the crowdsourcing project, RunSpotRun[2]. The project focuses on a smartphone application to facilitate crowdsourcing video capture of runners at marathon events by spectators (Exhibit 10).

Exhibit 10. RunSpotRun

[2] Previously the MarathonLive Project: http://marathonlive.blogspot.co.uk/

Spectators use RunSpotRun to record videos of the marathon. As runners stream past, by tapping in their number and spotting things spectators think are interesting happening in the race. When a runner is spotted, RunSpotRun records the time and location of the spot. The video stays on the phone, so users have to upload after the event. By videoing and tagging runner numbers using the RunSpotRun application, spectator videos are collated and gathered to create a rich, detailed video story of a runners experience during the race.

Source: https://www.runspotrun.co.uk/

Martin explained that they did a trial in September (2013) and were amazed at the data, which was collected. They recorded 300 videos with 1800 individual runners spotted or 25% of runners in the marathon. The video gave geographical data on the marathon and so mapping technologies can further aid the presentation of the data. The study raised questions for the development team in terms of informed consent from the runners being videoed as well as other spectators, and ethical guidelines for *'in the wild'* projects such as this (Anstead *et al*, 2013).

A theme emerging from the discussion was the presence of audio as well as video in digital storytelling to deepen the personalisation of the experience for runners; and content from other sources to convey a richer experience.

"Speaking as Chair of *Resonance FM*, two things are missing. One is sound and one if runners themselves. *Resonance FM* used as lightweight micas to generate real-time broadcast to cut between experiences of runners in real time. Proved to be useful way of broadcast." (Tony White)

"Want to hear sweat and anguish of runner. With this you are getting view of spectator." (Ju Row Farr)

"Are they considering combining multiple sources with video captures like this but also footage found on something like YouTube which has been recorded by a professional broadcaster." (Philo van Kemenade)

"Community radio might support this kind of thing better?" (Tony White).

Another theme to emerge during the discussion was the motivation of crowds to participate in the creation of a personalised experience for someone else they might or might not know through the sharing of video data. Numerous crowdsourced projects have failed because they did not present a compelling reason for participation, with many also succeeding.

"How you link in those people who weren't part of what you were doing." (Nina Reynolds).

"It is all about incentivisation." (Martin Flintham).

"All about long tail of broadcast." (Matt Adams).

"You burst open the user with this. Things like incentivisation, certain steps on semantics. I fell like incentivisation is a bit of a dirty word." (Ju Row Farr)

"Think word for marathon is storytelling - in order to do the run they have to tell the story." (Liz Whitehead)

"How do you get individual people to invest in a story?" (Martin Flintham)

6 | Gifting Personal Interpretations of Galleries

Lesley Fosh (University of Nottingham) shared her learning from a project exploring the design of a personalised tour of a gallery (Exhibit 11). Lesley shared with the group how galleries and museums are constantly seeking news ways to engage visitors, and in this face three challenges: a) engaging multiple interpretations of curated works, 2) personalisation in the face of large volumes of information, and 3) socialisation and collaborative interaction of visitors to galleries in pairs or groups (Fosh, 2014). “A key limitation of personalisation for galleries and museums,” Lesley explained drawing on the work of Serrell, “… is that attempts to categorise visitors into different types or styles are often overly simplified and aren’t of practical use to exhibition designers. Gifting a personalised tour to a friend or loved one is a way we think to overcome that.”

Exhibit 11. Experimenting with the gift giving of a personalised gallery tour

Eight people participated in the study in pairs, with one of them personalising a tour for the other person, not knowing quite how they would respond to it. She enabled one half of each couple to “gift” a personalised tour to their friend/partner. The giver chose five items, and for each chose a piece of music, a vocal instruction to do something, and a personal message, which were combined into a personal app that the other then used to explore the museum. The people receiving the tour didn’t get a chance to reciprocate the experience. Each gift was a piece of interpretation imbued with a emotional and personal quality that turned something quite prosaic into poetic experience.

Source: Fosh (2014)

“This work opens a dialogue around the meaning of exhibitions and personalising through the lens of gift giving, with themes running through the different experiences being varied.” Lesley explained. “An example of this, is in one of the tours how the girl designing it to include something fun for her partner, in this case dance music, but then also something a bit darker which was included to encourage him to confront his fear of death.”

Lesley concluded how the project revealed how pairs of visitors negotiated these experiences together showing the approach of gift giving personalised gallery experiences could deliver intense experiences for both participants, but also required them to manage social risk (Fosh, 2014). Her study suggests that the dynamic of gift giving scaffolds visitors in making interpretations and can lead to rich and intense shared visits.

A theme to emerge during the discussion of this work was the intimacy, the shared emotional and personal experience created, one to one; as well as an appreciation for resistance of the use of technology to build up a personal profile from which to personalise from.

“We seem resistant to build up a personal profile.” (Anne Nigten).

“Awkwardness of us receiving gift from someone and us not being able to understand the intimateness of it. It reminds me of mix tapes in the 1980s: the cover, the order of the tracks and the context, personalness around it.” (Matt Adams)

“People kept coming into the theatre and saying they loved Lesley's project.” (Dominic

Shaw)

"Like how there is a secret language in this - probably genera shapes in this and key points which can be sourced from input from people." (Aste Amundsen).

"It was orchestrated so that the participants would get help with making decisions." (Lesley Fosh)

A second theme to emerge was of the repurposing or sharing of stories created for someone else to others akin to the sharing of personal stories with strangers.

"Authoring stories. Maybe we can tag them in some way. Cut up parts of stories that will have an impact on other people. What if could use other tags for other people?" (Matthew Tyler-Jones).

"Would be mortified if someone went and engaged with experience made for me." (Adam Sporne).

"How could you have an emotional journey based on what other people experience?" (Nina Reynolds).

"Everyone has a reaction towards death." (Ju Row Farr)

"With mix tapes, people were proud when someone would share mixture they made Philo - ideas around remixing - what if there was a repository of all these things and you could take bits." (Matthew Tyler-Jones)

This session highlighted that personalisation can also be intimate. In the context of Big Data and profiling, experiences while personalised are not always intimate or have the emotional resonance that comes with the social connectedness of experiences created by or shared with friends or loved ones. It poses implications for considering 'who' is doing the personalising --- a friend or organisation; as well as 'what is informing the personalisation' --- data or an emotional connection.

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7 | Prof Tanda's 'Guess A Ware': Creating Personal Mobile Experiences

Nick Tandavanitj (Blast Theory) shared with members about how the team is working on a new project, *Karen* an intimate personal mobile experience. "The driving force for this work." Nick explained. "… is exploring how to create experiences in mobile spaces. This is an interesting space in which to talk to people, a more intimate space." He also considered the role an earlier project, *Prof Tanda* had on the groups interest in profiling, personalisation and Big Data.

Exhibit 12. Prof Tanda's 'Guess A Ware'

Prof Tanda's 'Guess A Ware' is a context aware mobile phone game that invites you to take part in experiments on your environment and reflect on the impact you have on it. The main goal of the project was to develop an interactive mobile phone-based game that collected environmental and location-based (contextual) data on the users, in order to provide relative information on their environmental footprint and persuade them to alter their habits to more environmentally friendly ones

A character, Professor Tanda, asks players questions about their day to day activities and life to establish

their environmental footprint. Through a series of quizzes and activities you learn about your carbon footprint and find ways to reduce it. Prof Tanda lives on your mobile phone and alerts you 2 or 3 times a day to play with him. Play sessions last between 2 and 10 minutes and involve activities such as answering questions in a quiz, performing a task for Prof or doing some activity with the people that you're with at the time. Feedback during the game is given via hints and tips from Prof Tanda about ways to reduce the player's environmental footprint, entertain and save the player money. The game is designed to be light hearted and humorous to encourage players to interact with the system and present information in a non-patronising, yet educational way.

Source: Blast Theory, Wright *et al*., (2007; 2008).

Nick shared learning from creating *Prof Tanda's Guess-A-Ware*, indicating that, "People didn't seem to have a concern about data gathering", "They used the app for people monitoring themselves" and "different outcomes based on contexts." Nick and his colleagues published a case study about the project (Wright, *et al*., 2008), in which they shared the feedback from participants in terms of 'what would make them engage more with Prof. Tanada?' To which participants replied (in order of frequency):

Exhibit 13. Prof Tanda's 'Guess A Ware': Participant Feedback

No.	Feedback	No.	Feedback
19	Activities that felt more tailored to you	9	Clearer actions to take as a player
17	More practical experiments	9	More physical activities
16	Content tailored for particular places e.g. things to do on the bus	9	Better jokes
16	Being able to review my game or my score	9	More jokes/absurdity
13	More feedback in relation to the goal	5	Less jokes/absurdity
12	Being able to monitor environmental levels	2	More information/statistics about C02 emissions
10	A clearer goal as a player		

Source: Wright *et al*., (2007; 2008).

A theme that emerged in the discussion was the role 'having a character' participants could interact with had on engagement and creating the world of the story. It also helped meaning of tasks through the characters relationship to them.

"Thing about having a character, it helped as character was totally upfront about stuff which helped the technological problem. A satire notion of being asked questions constantly, by throwing stupid humour against it."(Ju Row Farr).

"Wondered how people reacted to things like when showing graph. What is phone talking to?" (Martin Flintham)

"When referring to diary, [he] might refer to different things." (Nick Tandavanitj).

"So hybrid - present data and ask people, what does that mean? (Martin Flintham).

A second theme to emerge was how through functionality and mobility of the application, enabled learning about what was going on around the app, in the participants life, that could add to the story and engagement. This helped to create a richer personal experience.

"The app would trigger twice a day and could analyse things such as music playing in background." (Nick Tandavanitj).

"Information about what we're actually doing --- important with contextual stuff linked to environmental science." (Ju Row Farr).

"Tests with people who are well beyond being told. For example, on day you put rubbish

out it asks you how many bags went and then two weeks later ask you how many bags went out that week based on idea of not asking you to do more of something (e.g., exercise) but rather commenting on what you 'are already' doing." (Matt Adams).

"It meant they were able to have more intimate dialogues." (John McGrath).

This session highlighted the role of 'developing relationships with characters' and the integration of 'a participants real life context' into the story being experienced to enhance the feeling of intimacy and personalisation. To close this session, Matt also reflected on the role of the setting from which the work emerged (e.g., research versus commercial) also played some role in its design. "I can see how working in a research setting can inform things. Started off with commercial perspective, but then became more playful. Gave them a chance to demo something and test something." (Matt Adams).

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8 | Continuing the Conversation

We started the second day of *Act Otherwise: The Invisible Hand* by reflecting on the key ideas that were inspired by the discussions the previous day. The co-dependence of profiling and personalisation was raised -- profiling and personalisation as two concepts that cannot live without each other. We also considered some interesting differences of Big Data as a cultural, technological and analytical set of concepts, but also the view of mythology of Big Data. The whole notion of data, meaning and knowledge, that was something to look for. The data ethics, and the data mapping were raised as interesting and important issues. The lack of transparency of what happens behind the scene then brought us to an interesting conversation about agency.

"This underlined my personal love and hate relationship with profiling and personalisation. I love it and I use it every day. Google and Social Media, with out realising it is very convenient in daily life." Matt shared.

The format for today, Matt continued, after a couple of morning presentations we would form playful small we groups and discuss some of the learning and this territory for cultural activity that maybe very interesting. He also indicated that in the afternoon we'd have the opportunity to create guiding principles for artists, researchers, developers and designers to consider when working with Big Data or participating in profiling and personalisation activities.

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9 | National Theatre Wales: Exploring Creativity in Community Personalisation

John McGrath and Katherine Jewkes (National Theatre Wales) opened the second day presenting on two projects. The first was a creative project involving data as a passport for passage in *Border Games* and the second an audience mapping project focused on how National Theatre Wales is developing their understanding of audiences through audience data.

To open the session John shared some background about NTW (Exhibit 13) introducing how they launched the company in 2009 with an online social network. "We created an online community even before we had office space." John shared. "We used this as a place to start the

community. This was the first exercise for the company to start the community, we each had to start and build a profile. For us, these personal profiles are a way to connect people. If you over personalise, you have undercut the social. We are asking people to create profiles so they can better connect. The questions we face now is where do we go next, where do we go with the data, and how we play with the creative experience of profiles?"

John highlighted that with this comes both challenges and responsibility. "It is always challenging when inviting someone to set up profile as people feel people are out to get their information. This goes back to Kelly's presentation yesterday. Even my father was suspicious of giving information via the website when I invited him to join." John raised the context of creating a profile, has so much attached to it in terms of "what do people what to do with the data" and "Who is they?" It is an interesting tension to "want to create a profile" but "do not want to give away so much information."

Exhibit 13. National Theatre Wales

National Theatre Wales was launched in November 2009, and staged its first production in March 2010. Operating from a small base in Cardiff city centre, National Theatre Wales creates theatre across Wales, and each production has a unique relationship to local communities and audiences. For its launch programme, the Theatre Map of Wales, running from March 2010 to April 2011, the company staged a new show each month: 13 productions in all, each one in a different location, and each using a different approach to theatre-making. National Theatre Wales also undertook a real, in-depth engagement with local communitities: by basing most rehearsals in local spaces; through its TEAM programme, which recruited and trained advocates; and through the NTW Assembly, staged in each location where the company worked - using theatre to engage with debate around local issues. Behind all of this activity lay a digital presence and an online community that has established the company at the forefront of digital thinking in theatre.

Source: http://nationaltheatrewales.org/about#ourstory

Katherine shared about a project NTW is working on in collaboration with *NoFitState Circus* exploring the possibilities for playful data capture (Exhibit 14). Katherine highlighted in her discussion the importance of small data as well.

"The key theme with digital products is Big Data. Before I started at NTW I was a freelancer. I remember one arts organisation where the data was on a hard drive of 19,000 records of young people that was readily available on the desk, at another in a shoebox and not uploaded to a database at all. What happens within arts organisation, when we talk about data, lets talk about small data practices, before we talk about big data." Katherine thinks data needs to be thought about differently and we need to capture it playfully.

Exhibit 14. Playful Data Capture

As touring companies running both ticketed and non-ticketed events of all shapes and sizes in all sorts of locations, *NoFitState* Circus and *National Theatre Wales* shared the same challenges in terms of capturing cohesive audience data and holding that data in a single place.

With a combined annual audience of approximately 130,000 in 2013, both organisations held data on less than 10% of this audience, with no means of capturing any data from un-ticketed events. Furthermore, the less-than-10% of data that was available was sitting in a number of silos – social media platforms, CRM systems, 3rd party box offices, mailing lists, and online communities. With partial, fragmented and, worse case, NO data, it was impossible to

develop rich, engaging and long-term dialogue with attending audiences. Both organisations had begun looking at how to tackle these issues and both were keen to explore how digital could assist the solution. In sharing a set of problems and, critically, the same mind-set in terms of exploring the solution, *NoFitState Circus* and *National Theatre Wales* decided to form a partnership.

The Digital R+D fund for the Arts in Wales provided a great vehicle for this collaboration. Bristol based Digital Consultancy, *Joylab*, was brought in as technical partner and an application was submitted with the stated ambition to: **Find playful and engaging ways to capture attending audience data and maintain a rich and lively dialogue with this audience after their attendance.**

Source: http://artsdigitalrnd.org.uk/projects/nofit-state-circus-ntw/

Katherine shared that the key data challenges NTW face include, 1) audience data is silos in social media networks. There is no way for them to create cohesion across our databases; 2) they hold no data for attenders of un-ticketed events, and 3) they may not access the data if point of sales is through a presenting partner. “As a result,” Katherine explained. “we only have a cohesive conversation with only 10% of their audiences. Working with *Joy Lab* (Digital Lab) we are trying to map an audience experience structure (pre-show, show, post show).”

John introduced the production, *Border Game* that NTWs is working on (Exhibit 15). This production specifically involves the collection of data as part of the creative experience.

Exhibit 15. Border Game

Active Citizen Programme
BETTER EXCLUSION TOGETHER

The Autonomous Republic of Cymru is an independent state operating a points-based migration system. Its borders have come under increasing pressure, recently - its health and education systems are still free, and there is plenty of work for skilled workers. An outbreak of TB in the Royal United Kingdom of New Britain and Northern Ireland (or NewK) has forced the issue to breaking point. Life is no longer safe in the NewK, and Bristol has become the epicentre for illegal migration and a gateway to security and prosperity in the Autonomous Republic of Cymru.

Bordergame offers its players a safe haven from the perils of their old lives. All they have to do is make it from Bristol to Newport, without arousing the suspicions of the Border Agency of the Autonomous Republic of Cymru (BAARC) and its online, volunteer army of Active Citizens.

Source: http://nationaltheatrewales.org/bordergame

The premise is that the Wales / England border might be closed and you might want to smuggle into Wales. In order to engage, to participate, you have to give up data, just as you do with different types of passport and visas and as well do with the *Tesco Clubcard*, John explained that the artists have ben working with refugee community. What they ares giving you is their experience. Audiences can also participate online, “to observe through surveillance online and make decisions as to which people should be ejected as they have terrorist tendencies.” So you can inhabit different experiences --- border control, refugees, taxi drive and you get a glimpse of different experiences.” *Border Game* explores the idea of the exchange of profiling and the exchange of data in a very human way.

A number of themes emerged from this session. These included thinking about data creatively and creative solutions to data management practices; consider data in terms of as both small and big data. A further theme was the purpose of digital profiles and profiling practices --- why are we profiling, what is our intent and the experience for whom we are profiling?

10 | Creating Life Charms from Life streams of Bio-data

Giles Lane (Proboscis) shared his experience working with bio data and explore creative ways to make bio data meaningful to people during the project *Lifestreams* (Exhibit 16).

Exhibit 16. Lifestreams

Lifestreams, proposed a novel way of thinking about the nature of biosensor data and its relationship to how we live our lives. We sought to move beyond the simple graphs and number counting that pervades so much of the 'quantified self' meme towards the poetic and numinous; to capture something of the epic in everyday life. Our aim was to transform our relationships to digital data from the ephemeral of screens and interfaces into something that encompassed the tactile and material producing a more subconsciously emotive and emotional experience – an artefact or Lifecharm.

The lifecharms were created by capturing a range of personal biosensor data types (heart rate, body temperature, blood pressure, step count, sleep pattern, exposure to air pollution) and applying the data to a workflow using algorithms to extend the principles of the helico-spiral with time-based rules. These allow us to 'grow' the shell in the Groimp 3D modelling environment producing the initial 3D model surface which we then post-processed using Meshlab software for export as a stereolithographic file. The file can then be sent to a 3D printer to generate the physical artefact in a variety of different materials such as plastic, metals, glass, resin and ceramic. What makes the lifecharms unique is that they are not just parametric or formulaic transmogrifications of the raw data but generative because time as a key element informs the variations in the growth grammar that evolves the shells.

Source: http://proboscis.org.uk/tag/lifestreams/

Collaborating with *Philips Research Laboratory* in Cambridge on this project, the aim was to create mindfulness around your wellbeing through personalisation not through profiling. How do you work with people who "think" they are healthy? How do you represent their wellbeing in a meaningful way.

"We've started using things like fit bands etc., which monitor our data. After a while though they get forgotten. 90% apps on smartphones are deleted within a day of being downloaded. Do we want to wait until we're sick? Why don't we want to pay attention to habits and behaviours that make us healthier?" Giles questioned if all this is about 'data that is meaningful' OR is it the meaning that we make from what the data is telling us?" Giles and his team set out to take data from the graph and transforming it into something you can hold? Something more personal that you can take with you, an object created with your data but is not readable. It is not a container or a channel through which data can pass. It just is.

In this the interest is in data not as data, for what it tells, but more in its symbolism being a source of knowledge or meaning making on a personal level.

One theme to emerge from this session was data used to create a symbolic personal experience. A non-readable object used for meaning making, not as exchange. The data is not travelling, it just is.

"It's interesting how quickly we are to give up our agency to a crude device…we're more

willing to accept an external reflection on ourselves than do a self reflection. These shells are philosophical reflection objects." (Giles Lane).

"Can't take shell to doctor and say this is my data" (Adam Sporne).

"It's the experience of it. If it's in my pocket I don't need to go to doctor anymore." (Ju Row Farr)

"You want to carry something around because you want to be mindful of your wellbeing. It's not for everyone but that's fine - thinks in 4/5 years this will be available." (Giles Lane).

"Giles focused on it not being readable. What about idea of it being personally readable and prototyping several shapes." (Nathaniel Slade).

"No two shells are the same. People have said it would be interesting for people in pub to pull out shells. This kind of thing is driven by a competitiveness."

"People might not to show their shell." (Niki Woods).

Tensions between the creation of **deeply personal experience** that people do not want to share and an engineering mindset of the need of its **value in what it could share**. "What does it represent?" vs. "What can it do?"

"Developing a 'deeply personal experience' it doesn't want to make people want to share that with others." (Marina)

"Transmutation of data mean over time or in the moment (mindfulness). What is the synergy or perhaps humanity that we bring towards an object or storytelling." (Ju Row Farr)

"Does it change people's behaviour?" (Adam Sporne)

"Hasn't given it to anyone yet. With big companies working on this, you think they will put money into taking it forward but they might not do. Think as engineers which isn't quite how you think it might be." (Giles Lane)

"Not directly readable and so not a passive experience. Engineers keeps asking how do I know if I've drunk too much from the shell - it's like, you know if you have or not. More there for reflection." (Giles Lane)

Agency also was raised during this session. The nature of objects (e.g., shells, cards) used to facilitate the ease with which we participate in data sharing, yet remain passive unaware of our participation, or do we?

"It's a personal experience, it's for yourself. We always create these objects cards but they're really for other people to collect data on us." (Kelly Page)

"Agrees and disagrees. A card is for someone else but giving data to someone else but don't care about it. Feels like someone else had made it, machine might have made it but doesn't care." (Ju Row Farr)

"It's about the mythology of data. We imagine it has higher level than say us, but not necessarily true. There is a kind of selling thing around big data." (Matt Adams).

"We can feel powerless, like it's being done to us by corporations and governments. How do we turn it back and take charge of it ourselves." (Giles Lane).

"Where does user of project's agency come in?" (John McGrath)

This session encouraged much discussion around creative ways to use data for meaning making, creating experiences focused on personalisation not profiling. Experiences wherein the purpose is not to share, but to encourage people to be mindful and something we can carry with

us not for its utility or perceived financial incentives, but for a deeper meaning.

Case Insight Summary

A summary of thematic insights that emerged from discussions around each case project or presentation during *Act Otherwise: The Invisible Hand* is shared below.

- The **value of data in profiling**, and how companies are using profiling to **aid decision-making** in the provision of services, especially in financial services and health care. The notion of the financial value of profiling dominated the discussion.

- The **ownership of data** collected and shared and the **nature and transparency of this exchange**. The **motives of who collects it**, and the politics used to rationalise it. Some participants shared that 'it is all about the money' while others dug deeper into motives for profiling activities.

- Participants started to share what all this means in a social context. Matt Adams introduced the notion of '**data at a social level**' providing for a discussion into the way we think about the social or cultural implications of data.

- The **dominant rhetoric around profiling 'making things better'** and a **drive for 'efficiency'** as well as the **assumptions** and imperfections inherent in the practice of profiling.

- **People's awareness of and access to information** about how data in large data sets is collected, analysed and used, and by whom. For many participants this highlighted **inherent issues around inequalities**.

- A debate about **power and agency**, **how actors in the system interact**. Tensions between **different ideologies of knowledge** that is inherent in the discourse around Big Data, profiling and personalisation also emerged. The approaches discussed slipped between the **transactional model of knowledge** as tangible to be collected, as currency, as exchange, used to predict/determine (e.g., management science view) and the **cultural model of knowledge** as shared and socially constructed, as negotiated, as meaning making (e.g., an anthropological and artist view).

- A call to critique the analytical practices used to make sense of Big Data and their assumptions; a **need to also push the boundaries of our understanding of the methodologies** emerging from across different fields, that could aid making sense of its social implications.

- The **role of science** and academic rigour in our knowledge of profiling and personalisation as compared to **management practices of companies**. Who are actors in the system we can learn from? Where are artists in this?

- The **ethics, assumptions and impact of profiling complex and sensitive issues** such as mental health from their behaviour (e.g., Mevoked). What is the **responsibility and accountability** of how the system is devised?

- What is going on behind the scenes to learn **how are companies experimenting with data and profiling** that could have **social implications if shared more openly**

- The **presence of audio as well as video in digital storytelling to deepen the personalisation** of the experience; and **content from other sources** to convey a richer experience.

- The **motivation of crowds to participate in the creation of a personalised experience for someone else** they might or might not know through the sharing of video data. Numerous crowdsourced projects have failed because they did not present a **compelling reason for participation**, with many also succeeding.

- The **intimacy, the shared emotional and personal experience created, one to one**; as well as an **appreciation for resistance of the use of technology to build up a personal profile** from which to personalise from.

- The repurposing or sharing of stories created for someone else to others akin to the **sharing of personal stories with strangers**.

- The role **'having a character'** participants could interact with had on engagement and creating the world of the story. It also **helped meaning of tasks** through the characters relationship to them.

- How through functionality and mobility of the application, **enabled learning about what was going on around the app**, in the participants life, that could add to the story and engagement. This helped to create a richer personal experience.

- Thinking about **data creatively** and **creative solutions** to data management practices C

- Consider data in terms of as both **small and big data**.

- What is the **purpose of digital profiles and profiling practices** --- why are we profiling, what is our intent and the experience for who we are profiling?

- Data used to create a **symbolic personal experience**. A **non-readable object used for meaning making**, not as exchange. The data is not travelling, it just is.

- Tensions between the creation of **deeply personal experience** that people do not want to share and an engineering mindset of its **value in what it could share**. “What does it represent?” vs. “What can it do?”

- **Agency** also was raised. The nature of **objects (e.g., shells, cards) used to facilitate our participation** in data sharing, yet we remain passively unaware of our participation or do we?

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11 | Cultural Reflections

Ju Row Farr (Blast Theory) facilitated the first of two small group discussions. She shared her thoughts on the rich conversations that we have shared over the past two days, and the ideas that have resonated with her such as ‘data beyond representation’, ‘boarders and bleeding edges’ and profiling and personalisation as ‘real life activity’.

Ju encouraged participants to form into small playful groups to explore our cultural reflections from the two-days of discussion, sharing back key ideas that resonated with us. The ideas shared during this session I have grouped into themes. (Exhibit 17).

Exhibit 17. Thematic Insights from Cultural Reflections

Designing the Experience	Narrative / People Access
• **Dissemination:** “Punchdrunk often have digital things in shows which we don't notice. They talk about digital dissemination strategies.” • **Experience Logistics:** Pragmatic things if know where audience live can get them to travel together to shows • **Audience value:** “As part of creative team, try to value online audiences as much as offline.” • **Engagement as contained:** “Can engagement still be contained.” • **Learning engagement:** “Facebook can get people to participate / engage (e.g., of survey given). Why can't we? • **Sustainable:** “Do online participants or audiences pay a subscription. People pay for tickets to physical experience?”	• **Access to information:** “Access of different documents depending on clearance level. Based on real events. E.g., Princess Diana's crash need to look at documents involved with it.” • **Point of access:** “We can come in at any point. Is that a good point for data being available? Opinions change continuously. Look at court cases or Facebook. Notion of data as narrative not static.” • **Artist access:** “Everyone is terrified with these questions. Have colleagues who need ethics clearance as dealing with human beings modelled on medical communities. BUT with anthropologists doing field notes don't care! Where is the artist with respect to access?” • **Participant access:** "Locative data on people - how we can use this to find people/ be found? Foursquare can find friends on it - Could see that Katherine’s boyfriend was shopping in TK max!"
Social Exclusion / Participation as Choice	**Data as Living / As Life / Alive**
• **Don’t own:** “Lives in US and doesn't have TV. In 40/50 yrs. time, will I choose not to have access to internet? People confused by this self selection for social exclusion.”	• **As life:** "How do we keep data human? It's often dehumanised." • **Curation of life:** “Facebook is a curation of things we're doing anyway.

• **Disconnect:** “Family goes offline for a year - only let kids use it for homework.” (Book: Factual) • **Disappear:** “Journalist paid to disappear (Wired). Had to make his way and people had to find him and ask him if he was the person. Looking at ease/difficulty of not being traced.” • **Stop Interacting:** “Stopped interacting on Facebook. Wanted to see what happened when people gave her info.”	• **Life difference:** “Value is different generation to generation but also in different cultural contexts. Carrying around the shells would be tricky. For example, phones (iPhones) look nice without cracks in them. Younger generation working with all have cracks in their phones. They would not be able to keep the shells beautiful for more than 1 day.” • **Network Linkages:** “On forums people link to previous posts. It is still there allows us to do this but we repeat things.” • **Anchoring:** “Want to anchor in something which can enrich my life, but what if it goes wrong.” • **Maintaining Joy:** “How do we maintain the joy of life and doing things if we're sitting every day monitoring things - it's another task!” • **A Life Force:** “Data has a hold of you. Your thoughts, your life.” • **De-instrumentalisation** “What other behaviours are introduced with this de-instrumentalisation of data.” • **Inherited:** “Should data be inherited? Should people be able to give their personal data and hand it down?” “Should it be destroyed? Ideas around Facebook process to deal with death.”
Agency / Empowerment / Profiling Self	**Representations of Data**
• **Data sharing choice:** “Discussions around the user choosing to give data. We choose to engage.” • **Self-profiling:** “Audience can take on profiling for themselves to be participants or characters in experience.” • **Craft own experiences:** “Empowering people to craft their own experiences to disrupt a dominant narrative of corporate/government control of data.” • **Data Literacies:** “Ideas around communities and empowering people by helping them understand their data.” “Can’t free people from that until people have resources to go through own data. Need environment when people can become literate in that.” • **Computation Freedom:** “Freedom of data but also freedom on computation is important too.” • **Hacking:** “Creative hacking issue, empowerment which is a collaborative act and a community aspect involved in it. Sharing and the flipping of the power image.”	• **Frame of mind:** “Shells de-instrumentalise data. It's something which put us in a different mind frame.” • **Perceptions:** “How might object representations of data allow us to see and experience it differently.” • **Movement:** “How we can use objects to get us places e.g., the shells.” “Idea of physical representations of data and how we can access it. Should we carry something physical around which represents this?” • **Falseness:** “Algorithms attempting to take our data and represent it visually but how there is a falseness to this.” • **Tangible:** “Tangible representations of data e.g., mailing list on table to fill in. Physical representations of access to data are nice. Should there be a key or fob I carry around which represents access to data.” • **Opaque:** “Facebook movie of our lives - why does it feel odd? Algorithms - way it's generated is opaque. We don't know what it's doing. It's trying to represent our lives, rather than just our lives on Facebook. If it explained reason it would be better.” • **Visualisation:** “ Can we collect every single bit of data we've had and author it? If I have a visual representation of something e.g., lifestyle, would this be a problem?”

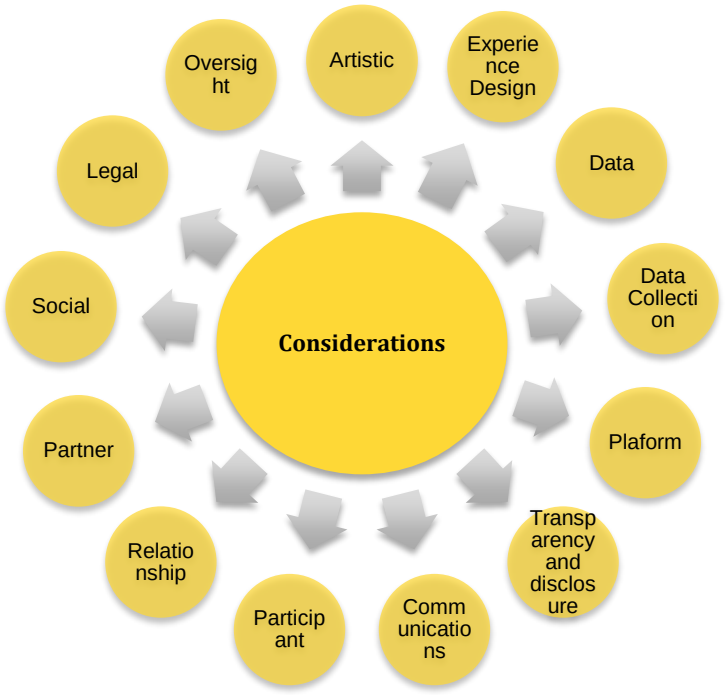
Without Context / Expose Assumptions	**Improvement / Benefit / Efficiencies Rhetoric**
• **Context:** “How giving just data, but no context, people often find it difficult to form an opinion of something.” • **Ritual:** “Power of data and profiling is around the ritual of it - reflecting on this.” • **Iconic Values:** “One thing could be icons on towns and you click on them and find things out about it. Data being represented through a set of values.” • **Indicators:** “Need context to understand this. Might be given unemployment stat of town, but wouldn’t understand data fully until have visited it.” • **Expose Judgments:** “Maybe told stats and then decide whether to go or not. Has no tangible experience of place but might make judgement based on stats.”	• **Belief motives:** “Why do people think that using data makes things better?” • **Achievement aims:** “As arts organisations how can we use the data we've collected towards achieving things? • **Outcomes:** “What if giving data allows you to be part of a community - would this make us happier in giving it?
Making Big Data Personal	**Folklore and Fiction**
• **Emotional connection:** “Big data is impersonal. We don't feel an emotional reaction to stats as much as we do to stories of individuals.” • **Individual stories:** “Big data is impersonal. It's when you look at each person and the story that it has more impact.” • **Zooming out:** “With big data it's hard as you're not just looking at one relation, you're zooming out, how can we bring it in?”	• **Memes:** “Memes - contemporary folk law - some aren’t true, some funny.” • **Myths:** “Lordes and Grammys video.Urban myth began around it that people believed even though they couldn’t find the video.” • **Spread:** “People keep saying how Morgan Freeman is dying but it's not true! Word spreads online.” • **Data as mythology:** “How might we be turning data into a mythology? • **Founded on fictions:** “Our whole imagination is built on fictions. People we call real are creations of media.”
Privacy / Consent as Contemporary Phenomena	**Data as incomplete / inaccurate / messy**
• **Norm:** “Is privacy the problem? What if everyone knew everything about each other?” • **Consent:** “Freedom. How much of our data is taken without consent. Matthew was talking about what if everything was completely open?” • **Contemporary:** “Perhaps the concept of privacy is a cultural and a contemporary thing.” “Privacy is quite a contemporary western idea. It's a construct of our society.” “Pre industrial revolution privacy less important.” “Class driven, historicised concept - post industrial bourgeois.” • **Still Learning:** “We live in a post private age but haven't managed to theorise our way through it.” • **Secrecy:** “Privacy is different to secrecy.”	• **Inaccurate:** “What happens when historians are looking through our data but it is infect not factual as people often create an inaccurate brand of themselves online?” • **Translation:** “Data can't always be translated.” • **Missing or incomplete story:** “In conversation you can't always recap on all these things. Notion of miscommunication. In data though we are expected to do this.”
False / Truth / Identity as Constructed	
• **Game system:** “If you put lots of fake things into system then say people looking at it 40 years later and map out someone’s life, you would need to deal with issue of them playing a	• **Marketing:** “Facebook is about marketing yourself and categorising yourself. Whether or not that big data is a representation of who you are. For the most part it is a representation of

game." • **Inauthentic:** "People create a brand around themselves, it's what they just want to present. E.g., on Facebook people present non-shitty bits of life. It's a false data set." • **Bias:** "Some people are paid to write blogs."	yourself." • **Convenience:** "End up describing yourself because it's convenient. What if you could step into other people's brands?" • **Automated:** "Algorithms attempting to take our data and represent it visually but how there is a falseness to this."

12 | Cultural Considerations

Kelly Page (Columbia College Chicago) facilitated the second small group discussion of the event. The purpose of this session was to generate some guidelines or principles that can aid artists, researchers, developers and designers interested in the cultural implications of Big Data, profiling and personalisation (Exhibit 18.). This list is not intended to be a list of standards or policies. It is a list of considerations to help guide people developing cultural work.

Exhibit 18. Cultural considerations for working with data



| Artistic Considerations

- Art is the data we get rid off.
- Being an artist or non-profit may allow us to experiment with data more, and sidestep disclosures. Should we?
- Art is the nuances and blurring of boundaries, this is what personalisation is.

- In cultural work you're not searching for an answer, in data you often are.
- Difference in practice and conceptual issues between artists, arts organisations and other types of companies
- Artists have a vested interest in in doing something which isn't wrong, doesn’t mean we don’t
- Need to develop confidence in how arts community use data in creative and exciting ways.
- Need to get away from self-defeating idea that asking people for data is bad. We need to ask for it in creative and authentic ways.
- Arts funders do not always know what they are talking about, constrained by approach.
- Unique courage: There are situations where artists wander into something which corporations would be terrified of.

Experience Design Considerations

- Profiling different to the interplay of subjectivity of experience. Profiling is much more programmatic.
- Conversations around how you present data as part of experience.
- Designing personal experience as part of the artistic experience.
- Take the time to play with this stuff. Artists gnaw at something until it's done.
- Personalisation is different to profiling, and thus its design is different.
- What point of view you are taking influences design --- artistic, funder, participant, observer, and partner?
- Which language/s you are using.
- Unexpectedness. If goes off conversation then gets shut down. The by product is just as interesting as the sculpture.
- Traumatic experience

Data Considerations

- All data is partial, incomplete and/or inaccurate.
- Data is part of money futures. How do you consider its financial value?
- See as a cultural asset
- What types of data are you collecting?
- What is the legacy of the data, especially historical data?
- Are you taking data and using it to fund your practice?
- When data is part of the work, participants might lie. Inaccuracies.
- We think so much data is personalised but it's actually inferred from profiles.
- Data can change depending of use. You can subvert meaning.
- Relationship with data - what happens to that data after the experience?
- Can you re-use data between projects? What would this mean? Re-using it for people coming to multiple shows. Get out clauses as well as people might not want it to be used for certain things.

Data collection considerations

- How is the data being collected (e.g., harvesting, scraping, self-report, observations)?
- What are the touch points for collection during a cultural experience?
- What is the act of collection like?

- Can collection be a creative act? Goal focused on de-instrumentalising data.

Platform Considerations

- For a mobile game, choose between iOS or Android as don't have funds to do both.
- Collection tools as the game
- Who funded by influence technology used (e.g., Google)

Transparency and disclosure considerations

- Avoid the secret way it's often used and manipulated. Be open and transparent.
- Timely disclosure of what is being collected and done with the data.
- What are participants agreeing to? By saying yes to one thing doesn't mean you're saying yes to everything.
- When will data be removed from the database? What if the user could set the contract, and say my data will expire after a certain time?
- Implications of opting out and opting in. Can participate if you opt out of giving your data?
- Making it explicit what data will be used for akin to creative commons scheme about use of data within artwork.
- Often there are massive T&C which no-one understands. Need to improve understanding through transparency. There must be a way for this to be moor clear, either in plain writing or some kinds of creative commons
- Your agency changes throughout life cycle of the data.
- Unsubscribe from data --- Can I do this? How?

Communication considerations

- How regular are your permission/consent updates? There should be regular updates about what data is allowed.
- Standardising ways of how people can ask for their data.

Participant Considerations

- Participant self-selection with regards to who participates. When you make work, you're deciding who you make it for.
- Audiences choosing to hand over data rather than harvesting it.
- See it as an on-going conversation.
- Access and disability constraints.
- Audience differences in expectations and participation. (e.g., Maybe older generations don't want to give up info as much as young people).
- Given reasons for wanting to do it but then consequences for audience – e.g., life changing reasons for doing it.
- When someone signs up for it, what about the people around them? The wider context of the piece in their lives?

Relationship considerations

- Commit to being there for someone else. Spectator and participant are fictional positions. Saying you will be there for someone is a real transaction.

- Be supportive. Data associated with users, a user history this can surprise people if unaware.
- Principle was about fair exchange, mutually beneficial
- What about trust? As artists, we are also data controllers, need to build trust in this capacity.

Partner Considerations
- Who do we have agreements with for the collection of data (e.g., Arts Council).
- Should we be questioning reasons for giving over data to third parties / partners?
- How do partners and industry treat and use (e.g., 13 segment demographic profiling)

Social considerations
- We don't trust ourselves. We sit in a network of critical frameworks.
- The biggest thing we, artists do for society is have these conversations, which people like Google are scared of.

Legal considerations
- Legal precedent, things might change. If constantly responding to legal might not get to do what you want to do with data (e.g., Channel 4 - Ivy4Evr).
- Issues of legality across boundaries (e.g., publishing data accessible outside the UK).

Oversight considerations
- Should there be someone who can enforce provenance of data in artistic / cultural context
- What if you object to art organisations being rated by government or other bodies.

Concluding Thoughts

At the start of *Act Otherwise: The Invisible Hand*, Matt Adams (Blast Theory) asked participants to consider a critical question throughout this event: 'What are the cultural implications of profiling and personalisation? What does it mean for the arts community?" The hope of the two days was ultimately for the group to walk away with deep rich insights of some of the cultural implications and at least 10 principles around Big Data, profiling and personalisation.

To close the event, Matt asked participants to reflect on the past two days and share any thoughts they have from the experience and as to how to move the conversation forward.

A number of participants highlighted the danger of creating a generic list of standards for artists to follow or guide their work. These could be open to misinterpretation, and if so generic they could be meaningless.

"There is a risk of falling into 13 segments scenario [Classifying]. Further, when I hear things like 'are artists trustworthy?' and I thinks they are but others might not. It is possible for [guidelines] of things to be miss-read." (Sally Jane Norman).

"At the centre to making a piece is a trust game. If people start to think you're not communicating but piss taking, it will fall apart. Trust issue isn't going to go away." (Nathaniel Slade).

“Guidelines which are so generic, they become meaningless. This could happen. Templates and references can this be grown out of art work?” (Sally Jane Norman).

Another theme to emerge was that some participants are ‘negotiating best practice’ and seek ways to mitigate project risk through learning and sharing.

“If I was that cautious about making art, then my productivity would go down more. Most of us are trying to negotiate best practice.” (Matt Adams)

“We're always learning in this space. From this stuff, there is the problem that funders might come along and then form 16 categories around all this. This is true.” (Kelly Page)

“What risk management tools, should that not be what the last two days should go going towards.” (John McGrath).

“Rather than defining best practice rules. Could be that we're constantly trying to move things forward and not trying to tie ourselves in knots all the time.” (Giles Lane).

Lastly, the importance of events such as this in a cultural setting are, to move the conversation forward, to identify the unique contribution the arts makes to the discourse and to assist sharing across disciplines and ideologies was noted.

“If we don't deal with their data in an interesting way people will assume we're using it like Tesco etc.” (John McGrath).

“Maybe the thing about this is that artists are looking to explore possibilities. Comes back to questions around ethics and ethos. We're doing it for a value beyond ourselves if disallowed for tension we might not be doing art anymore.” (Giles Lane).

“Interdisciplinary of conversation. There wouldn't be many places outside this type of cultural setting where we could do this.”

In summary, *Act Otherwise: The Invisible Hand* provided participants an intimate forum to discuss and share their ideas and learning about the cultural implications of Big Data and the practices of profiling and personalisation.

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Appendix A: Act Otherwise 2014 Event Participants

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Adrian Hazzard, Resident at Blast Theory / Mixed Reality Lab
Alex Peckham, Digital Artist
Anne Nigten, Director at The Patching Zone
Aste Amundsen, Artist, Director, Producer, and Designer
Barbara Gorayska, Artist
Calliope Georgousi, UX Practitioner at Accenture
Carina Westling, Independent Experience Designer / University of Sussex
Dan Lamont, Administrator at Blast Theory
Dominc Shaw, Artistic Director at Urban Angel
Emilie Giles, Producer at Codasign
Giles Lane, Director at Proboscis
Hannah Brady, Associate Artist at Blast Theory
John McGrath, Artistic Director at National Theatre Wales
John Bannister
Ju Row Farr, Artist at Blast Theory
Kate Genevieve, Artist at Chroma, PhD Researcher at the University of Sussex
Katherine Jewkes, Digital Associate at National Theatre Wales
Kelly Page, Assistant Professor at Columbia College Chicago
Kirsty Jennings, Business Director at Blast Theory
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Lesley Fosh, PhD Student at University of Nottingham
Lisa Finch, Co-Director at Fabrica
Liz Whitehead, Co-Director at Fabrica
Maf'l Alvarez, Student
Marina Jirotka, Reader in Requirements Engineering Computing Department, Oxford University
Martin Chorley, Research Associate at Cardiff University
Martin Flintham, Transitional Fellow at University of Nottingham
Matt Adams, Artist at Blast Theory
Matthew Tyler-Jones, Consultant and Visitor Experience at National Trust
Philo van Kermenade, Studio Resident at Lighthouse
Natalie Kane, Storyteller and Technologist
Nathaniel Slade, Tech Artist / Musician
Nick Tandavanitj, Artist at Blast Theory
Niki Woods, Associate Artist at Blast Theory / Lecturer in Performance at University of Salford
Nina Reynolds, Professor of Marketing in the Management School at University of Southampton
Paul Dungworth, Associate Artist at Blast Theory

Sally Jane Norman, Professor of Performance Technologies at University of Sussex
Sarah Clark, Artists' Assistant at Blast Theory
Tony White, Author
Vanessa Santos, Volunteer at Blast Theory

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