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Digital Public Space and the Creative Exchange

A human-centred approach to the common good

INTRODUCTION

The Digital Public Space (DPS) is the name given to an initiative catalysed and driven by the amalgamating of the archive digitisation strategies of a number of major UK public and cultural institutions¹. Embedded in the DPS is an unprecedented opportunity, that of exploring, redefining and evolving our current understanding of knowledge creation and sharing, and the chance to build tools that can help revolutionise our knowledge space. This venture requires joint-agreement on compression, storage and distribution protocols, and a common metadata and tagging system, as well as agreement on rights issues.

This is not an isolated venture. A number of similar initiatives exist across the globe, in France and the USA for example². What we can look at here is the broader understanding of digital public space, and some of the challenges we face in embracing this. Some of the core issues are those of identity, ownership, privacy, governance and accessibility. To help explore and resolve these issues, the AHRC-funded Creative Exchange (CX) has been set up as a research hub jointly-run between three universities, the RCA in London, the University of Lancaster, and the University of Newcastle.

The CX has three core functions. Firstly, to help define the relevant purpose, functionality and appropriate modeling of the DPS. Secondly, to explore the broader-based issues that digital public space

exposes by carrying out a number of field trials, and thirdly, to build new methods, processes, tools and skilled individuals in Knowledge Exchange through a number of projects and labs carried out in collaboration with industry and academic partners.

This paper establishes the context and background for this hub, and attempts to outline some of these core enquiries against current empirical observations. It explores parallel developments and opportunities in new technologies, and posits some possible lines for progression and invention. This is a new space, and, as with all evolutionary steps in our thinking, cannot be limited in its imagination by a strict adherence to previously proven metaphors and models. In order to think freely, we have to embrace the unprecedented.

THE CREATIVE EXCHANGE

The CX program is designed to undertake exploration of new models, methods and tools in knowledge exchange to enhance our understanding of digital public space. The rationale of CX as a whole is to frame an understanding of knowledge exchange, create moments where it will take place, and provide a durable context for the resulting work.

CX is focused on fostering relationships expressed in the form of creative design work (in the case of the RCA) and research output. A key method for brokering these multi-faceted collaborations is a series of day-long laboratory style events. Each of these days, held at respective universities, is designed to address a particular axis of the CX endeavor. For example the RCA held an event at FACT in Liverpool in November 2012 titled 'Redefining Working Life' attended by participants from; the BBC, The Bartlett, UCL; The Bossons Group;

¹ Including the BBC, Wellcome Trust, British Library and Arts Council England. See, for example: <http://www.jisc.ac.uk/inform/inform36/DigitalPublicSpace.html#.UpSfFBbybww> (accessed 26 November 2013).

² See, for example: <http://www.europeana.eu> and <https://archive.org> (accessed 26 November 2013).

University of Liverpool, and Unwork, London. The resulting projects include; Hybrid Lives, focused on the design of a co-working space; Rhythmanalysis, exploring self-measurement in the context of working life; and Where do you go to?, bringing remote workers together by visualising their work-tables. Multi-disciplinary teams receiving funding create these projects, which result in physical as well as research outcomes. A key feature of CX projects is that they place emphasis on how the participants work together, what processes are used, and how knowledge exchange happens, both within and between project teams. What is becoming explicit is a methodological approach to collaborative work that enables new models and meanings to emerge. The CX context allows for both conceptually ambitious research enquiries and broad investigations of the qualities of digital public space.

CX fosters a variety of types of knowledge exchange. Co-creation takes place when project partners explore ideas together, initiating ideation and brainstorming sessions, capturing and sharing the results. On another level project teams learn from each other's skills as the work is carried out. These skills often relate to diverse fields such as product design, workplace research, user interface design and theatre design. As the work evolves, skills are transferred informally around the table. Knowledge exchange also takes place between projects at CX-wide events. This enables a wider frame to be drawn around how people go about realising a project together. Practical skills, theoretical knowledge, organisational methods, and working habits are all examples of how people can learn from each other in this context.

CX main conceptual themes are; personalisation, taken to mean 'the

personalisation of media for different viewers and contexts'; experience 'new forms of mass experience events and media with the quality of 'liveness''; participation 'different forms of user-generated content supporting participatory media'; connectivity 'exploring pervasive transmedia, the increasing digital connectivity between people and things'; narrative, 'exploring storytelling in all its forms, existing and emergent'; and identity 'the individual within digital public space; ethical, privacy and security issues, IP rights and ownership'. Individual CX projects coalesce around these six themes.

The RCA's role within CX occupies two distinct levels of activity. Firstly, the RCA is an art school, an institution that cares about and nurtures creative work of all kinds. It is seen as providing design knowledge to the CX mix. This knowledge is expressed in an understanding of creative process, an awareness of the often intangible nature of design work, and a distinctly human-centred and creatively organised turn in the exploration of digital materials. The RCA has also long been a champion of practice-based research and the CX program extends and shares this tradition more widely with other institutions. For design education at the RCA, CX offers a new way of thinking about doctoral study. CX PhD candidates construct their research work through doing CX projects. Involving multiple project partners, creating diverse physical expressions of the research, and configuring institutional and industry participation in CX projects provide novel ways of encouraging and contextualising PhD research. The hope is that CX doctoral work will widen the definition of how design research is done, what it pays attention to, and how its lifespan may be extended outside the academy.

Secondly, alongside the event in Liverpool (2012) focusing on working life, the RCA has been concerned with modeling digital public space and eliciting structures for growth that take diverse forms. At a lab event held in London in February 2012 a group of participants drawn from data science, design practice, social enterprise and humanities research explored the social and political implications of digital public space. Various projects emerged from this event including proposals related to: Geo-located data mapping, hyper-local citizen journalism, community archaeology, and personal clickstream capture. All exemplify a different reading of the challenges and opportunities presented by digital public space.

THE DIGITAL PUBLIC SPACE

The Digital Public Space (the DPS) originally began life as a way of thinking about how the BBC archive could be made available and accessible to all. This was swiftly followed by the realisation that surrounding the BBC content was a huge seam of additional data and a new context for digitally mediated cultural experiences. For every single piece of published or broadcast content there are associated soundtracks, contracts, locations, unused footage, scripts and concurrent news, events and broader cultural contexts. Consequently, the project was understood to be the core for developing a living cultural genome. As the project grew, it became clear that other cultural institutions, those concerned with similar routes and parallel interests, could collaborate with this more ambitious vision. The BFI, British Museum, Tate, British Library, the National Office of Statistics' archive of births and deaths, and many others, could be drawn together to form an active working group.

The significance of this venture, via The Space (www.thespace.org), a joint online publishing project created by the BBC and the Arts Council, has now been recognised by government, through the Department of Culture Media and Sport, as the most important cultural event currently active in the UK. Subsequent CX related events have widened this view considerably and the DPS can now be said to more fully encompass the categories and themes described above. There is also currently an active cohort of researchers, practitioners, supporting institutions, and partnerships engaged in 'defining by doing' what the DPS may come to signify.

One key to the success of the DPS is an agreed standard for aggregation of distributed cultural data sources. hNews [1] is a good example of the kind of approach that can be useful. hNews is a microformat proposed by Associated Press and the Media Standards Trust to describe journalistic content. It consists of a number of descriptive fields that identify semantic content. hNews even extends to rel-principles which provide standard metadata descriptors for the journalistic principles of individual authors or organisations – an entirely moral quality. This means that any piece of information can be retrieved, viewed, read, and cross-referenced to others not just for its semantic meaning but also for its moral principles. hNews is built on xml and xhtml and uses hAtom, an open source metadata parsing framework. The example shows that it is possible to develop domain-specific descriptive metadata standards that can extend to entirely qualitative measures such as journalistic principles, all constructed on free, open access, collaborative technical platforms. The DPS calls for a synthesis of these models oriented towards cultural experiences and cultural knowledge production.

COMPUTATIONAL & DESIGN THINKING AS KNOWLEDGE EXCHANGE

Taken more holistically, digital public space calls for a view of digital instruments that encompasses ethics, memory, materiality and methodology, a definition of what public means in the context of digital interfaces and experiences, and an understanding of the norms of virtual spaces as they intersect with physical spaces. The CX initiative questions how we can test these new definitions and models in meaningful and useful ways, what kind of evaluation criteria are relevant, what are the moral implications and limitations, and what kinds of design are appropriate? Drawing on research approaches advanced in the area of Design thinking [2], widely taken up by business, CX projects have approached the DPS in terms of design and the implications for designers, educators, institutions, and audience; ethical procedures including privacy, rights, and ownership; evaluation instruments, methods and criteria.

In the context of recent debates on design thinking as a way of addressing non-constrained problems, the accumulation of digital materials in digital public space is more an open field than a closely defined set of static data entities. Digital data is seen as fluid, assuming diverse representations depending on the nature of the interactions that provide access to it. The result is an active and dynamic system. Each interaction with any piece of content in this system, plus the paths, journeys and connections through the content itself, can be stored as part of the growing pool of knowledge. People can access this pool of knowledge in ways shown by CX projects: to make sense of their personal browser history, to facilitate co-working and interdisciplinary collaboration, to gain insight into the daily biological rhythms of

work and leisure. Designing the systems that provide contextually relevant access to this knowledge is one of the central challenges of the DPS. How a piece of data is used is as fundamentally significant as the piece of data itself.

In contrast to the dynamic nature of data, books, DVD's and records can be described as closed object models, as can most media formats such as HD video for television or BWF files for radio broadcast. While there is a growing number of examples of augmented media types, such as digital maps or biometrically sensitive digital objects, the ability to store how any piece of content is interacted with, and detailed information about its connections with other data, remains a challenge. While it is now easy to connect large networks of people socially or professionally online, most systems that do this are closed and proprietary. The resulting network can feature diverse entry points, multiple readings, unexpected connections, and a textural richness beyond what any single institution or data standard could provide.

Other important factors that will require post-disciplinary thinking include; new or hybrid analytical tools, (for example for exploring data streams in real time), and ways of meaning making that integrate quantitative data with qualitative insights. This allows for new kinds of narrative to be told and evolve. For example through narrative interfaces that embrace tangible interactions such as Sublimate [3] or ways of revealing technical infrastructure such as Touch [4]. While multimedia databases can drive narrative experiences i.e. computer games, they come pre-loaded with narrative environments generated by games designers. The media database can be configured to deliver narrative elements at key points in the user journey or in response to specific user input, i.e.

searching, or turning left in a virtual cityscape. Database driven digital experiences are inherently hierarchical configurations: they are designed for non-linear atemporal expression since they must provide for a constrained multitude of different outcomes. This represents a significant challenge for how designers create systems that address the DPS.

Some relevant approaches to this new hybrid medium have been explored by Glorianna Davenport at MIT [5], along with Hans Peter Brondmo [6] and filmmaker Sally Potter [7]. The artists of the future will be the ones who can construct narratives through this interconnected space: they will be creating dramatic scenarios using text, moving image, sound, information, design, interaction, and synthetic sense to create their dramas and art. Some may use social and crowd momentum, others solitary journals. A further example is provided by the software studies initiative led by Lev Manovich at City University New York. The focus of much of the work done in software studies is on cultural analytics such as Phototrails [8] which orders photos posted on social media sites according to colour, location, and subject in order to reveal patterns in the global flow of digital images. Similarly we can imagine that one day you will be able to drop a media query into the DPS and watch as it resolves into a navigable, narrativised entity through a blend of captured user responses, such as Facebook comments and edits, and the kind of programmed data clustering seen in Phototrails. Appropriate and applied knowledge can then be addressed in diverse contexts, such as learning or news gathering.

Computational approaches in the humanities are now widespread and digitally mediated experiences have come to characterise many fields of intellectual

endeavour. For example in anthropology [9], computational approaches are concerned with the comparison of high-fidelity models for 'discussion about the ontology of anthropological phenomena and how they are best represented as theories and models'. Much of the resulting computational work is typified by a technical analysis of the natural world and an understanding of everyday human behaviour influenced by technical architectures.

In archaeology [10] computational approaches are used to analyse the results of comparative genomics. Computational or mathematical sociology [11] is concerned with modeling complex social phenomena using agent-based simulation, especially in cases that feature large data sets. Current approaches to research in the areas of computational economics [12], literature [13], and linguistics [14] feature similar methods and applications of technology. While the use of computer intelligence in humanities research is not new, it remains dominated by a technologically deterministic attitude. Digital tools are used for agent-based modeling, data comparison, classification, and category evolution. Computers are used as analytical instruments, rarely as expressive or qualitative devices and there is little reflection on the nature of technological mediation and the types of decisions it facilitates.

A key feature of the CX project is the examination of the understanding of digital technologies not just as instruments that aid analysis in diverse domains but also as subjects for research in their own right and as ways for expressing a human-centred technical paradigm. The design of digital technologies that aid people in their everyday lives such as hearing aids and robotic prosthetics is a well-advanced

practical field [15] (much work is on enhanced or augmented physical objects) and user-centred design is a well-established area of practice and research [16] with roots in usability and human factors research. The design of experimental interfaces is a step towards a human-centred technical paradigm but remains dominated by the search for useful applications of novel technologies such as smart textiles or flexible screens.

CX draws on theories from diverse fields but is primarily concerned with the design of a new context for knowledge production, a hybrid model of knowledge exchange taking in computational creativity, analytics and expressions along with human learning, social context and embodiment. The applicability of theoretical concepts to the creation of digital systems is often unclear. Theoretical diversity is a recognised feature of research in the areas of computational thinking and design thinking. The field is uncertain on what this diversity implies for the relationship between theory and practice.

What Sherry Turkle and Seymour Papert have described as 'epistemological pluralism' [17] divides opinion with distinct views about the search for a theoretical basis. These approaches typically embrace a series of ideas borrowed from adjacent domains adjusted to the needs of practitioners. Thus Activity Theory draws on psychology and Actor Network Theory on sociology. Situated Action theories are based on engineering disciplines and Distributed Cognition on cognitive science. Individually, it is hard to see how these approaches are useful to designers. Often, the original theories are contorted or layered beyond recognition to inform design research. While each theory has its passionate defenders, others value the strength in synthesis, and the opportunity

an open theoretical field represents.

One unifying factor is that these theories are concerned with context, with how people act in social and physical settings and with how digital systems can model or abstract those settings. For example, a key insight inherited from constructionism applicable to our work on the DPS is that culture and society are not seen as external to the mind, but that they are fundamental to the production of consciousness. In the general context of the digital public space this informs our view of the role that digital artefacts (languages, systems, software, objects) can play in learning about the world and the importance of how these artefacts are designed and what context they should exist in.

Dourish [18] makes the argument for two axes of embodiment in the context of interaction: a close examination of situated action, which involves detailed study of how people interact with technology when performing tasks. The classic example is a study of office employees operating a photocopier machine, in which he examines how cultural assumptions guide the nature of interactions [19]. The second axis of embodiment Dourish explores is tangibility and the design of digital systems that allow for full body interactions or that adjust their spatial configuration to the user. The implications for work in the DPS include an awareness of where interactions should take place, when they happen, what they reveal, and that they exist in a wider social and physical context.

CONFIGURING THE DIGITAL PUBLIC SPACE

Methods for the design and analysis of the DPS draw on a conception of data materiality that assumes the database to be a form of material object, one displaying observable, measurable properties, and

therefore definable, tractable and malleable. Designing for a system that can be configured in multiple ways calls for supple or iterative ways of working. It also means calling on a wide range of skills and therefore building collaborative contexts for knowledge exchange – one of the aims of CX. In terms of Knowledge Exchange, the CX initiative envisages an industrial, commercial, and academic culture in which government, creative agencies, design groups, engineers, sociologists, and scientists work in partnership with academics to form new clusters of expertise, research, and application.

A promising approach is suggested by AGILE methodology [20]. AGILE emphasises iteration, collaboration, flexibility, and face to face communication. It has been adopted primarily in the area of software development, but in the context of CX holds some useful functions for how to design products that maximise the potential of the DPS. Software projects are decomposed into units of activity and assigned to specialist teams. These teams work closely together in a series of time constrained periods of concentrated work known as 'sprints', often over three or four days. The series of sprints enables rapid product development through repeated testing, error detection and updating. In the context of CX the iteration and integration of small parts of the same system is being used to create distributed and incremental ways of exploring the DPS, drawing on a wide network of partners throughout the design journey.

Exploring curatorial practices from museology [21] as a way of organising content and designing spatial experiences has also been instructive to CX projects; using the methods of computational anthropology [22] to structure thinking about people and media environments, and

employing novel visualisation techniques to reveal connections and trails. The process of self-contextualisation carried out by anyone online produces a rich archive of personal data. At present machine intelligence hosted by global corporations such as Google are able to exploit this data for commercial opportunity while there are few instruments publicly available for Internet users to carry out the same level of analysis for themselves. Unconscious self-description presents a profound opportunity for designers to create digital experiences from this automated stream. The methods involved suggest automatic data capture can be reverse engineered to be of direct benefit to people and society.

Techniques from healthcare and bank records have shown how visual narrativisation can lead to greater understanding and insight [23]. Visualisation in the field of genome data holds promise for how to carry out pattern recognition in multi dimensional data sets [24]. The generation of quantum data in particle physics also holds some lessons for how to abstract a dataset for subsequent interpretation. Our own recent research [25] uses examples of genealogical diagrams to develop an interactive system whose interactions unfold over generations. We have also applied lessons learned from the technical analysis of financial data to the structuring of interactions over time. We have focused some research attention onto the fields of sonification (whereby data entities are assigned sounds) and spatialisation, which involves the design of physical data experiences in constructed environments [26].

Some of the key opportunities arising from the CX project include the development of new models and opportunities for practice-led research and research-based practice, plus new models for augmented experiences and post-screen, multiplatform delivery - a reshaped notion of broadcast media and spontaneous, shared, cultural events. Recent developments in the field of technology enhanced learning [27] and computer supported collaborative learning [28] emphasise the opportunities offered by technology for changing learning practices.

Digital technologies, as Rushkoff [29] asserts, have an inherent bias towards collaborative intent. Digital content is copied and distributed with unprecedented ease, (albeit often shedding its authorship details and supporting context along the way) and as new channels for sharing and editing become possible, mobile, dynamic, and cheap new models of learning will emerge. Future learning is already moving towards a free, globally distributed model as shown by The Khan Academy [30], the One Laptop Per Child Foundation [31] and MIT's MOOC. [32] These institutions aim to provide digital learning experiences at no cost, to anyone with the technical and cognitive tools to receive them.

Technology is now commonplace in the classrooms of the developed world and is already enabling new ways of learning; ones which place group collaboration over individual testing, and non-linear dynamic relationships between teacher and pupil. Multi modal learning and research strategies are also facilitated by technology. Some theorists propose that we are moving towards a post-logocentric [33] culture, one where imagery (both moving and still), sound, and performance combine and are incorporated into learning experiences and research outcomes. The DPS is well placed to take advantage of

these developments by, for example, providing a university course or a school curriculum centred around curated journeys through the DPS, incorporating multiple media types and response monitoring.

On a wider social level, a number of issues are raised which will form a key part of the CX focus. Three areas will be of main interest. Firstly, identity, with questions such as ownership, protection and privacy in the context of an ever changing domain of digital artefacts, online environments, interaction models and social constraints. Research in this area includes an investigation into online pseudonymity, the creative exploitation of publicly held data, and into patterns of working life. Secondly, social applications mean exploring issues such as social inclusion, remote learning, age-aware support, and welfare help. Work in this field takes in citizen science, self-measurement and the development of a theoretical locus for social interaction design [34].

In terms of the third key pillar, that of governance, we can study the new potential for community cohesion within and beyond geographic definition in the context of democracy and learning. New national governing models, localised information centres – online villages – and self-governing communities have shown the way. Recent projects focus on the narrativisation of digital archive databases, revealing hidden changes in online news articles [35], and the theorization of robotic displays as shared distributed, decohered data experiences [36]. The sequence of exploratory laboratories carried out by the participating institutions of the CX Hub continue to produce research outcomes in this area.

The CX project and the general field of digital public space is a new area currently

open for definition. There are many possibilities for research, for post-disciplinary collaboration, for commercial application, and for people-centred answers to the question of what kind of digital public commons we wish to inhabit. Our work in this area is based on a belief in the benefits of cultural production to society. There are new fields converging on computing including interaction design, programmable interfaces, computational poetics, and experience design. There is also much to learn from diverse fields of enquiry, both

professional and amateur. Looking backwards to previous ways of understanding commonly held assets, and forwards to the next hundred years of digital public life is also instructive. Creativity has a crucial role to play, it continues to communicate its value, to cast a critical eye on society, and to dream new ways of thinking and being.

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