Desire Lines: Open Educational Collections, Memory and the Social Machine

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Abstract

This paper delineates the initial ideas around the development of the *Co-Curate North East* project. The idea of computerised machines which have a social use and impact was central to the development of the project. The project was designed with and for schools and communities as a digital platform which would collect and aggregate 'memory' resources and collections around local area studies and social identity. It was a co-curation process supported by museums and curators which was about the 'meshwork' between 'official' and 'unofficial' archives and collections and the ways in which materials generated from within the schools and community groups could themselves be re-narrated and exhibited online as part of self-organised learning experiences. This paper looks at initial ideas of social machines and the ways in machines can be used in identity and memory studies. It examines ideas of navigation and visualisation of data and concludes with some initial findings from the early stages of the project about the potential for machines and educational work.

1.Introduction

> Real life is and must be full of all kinds of social constraint – the very processes from which society arises. Computers can help if we use them to create abstract social machines on the Web: processes in which the people do the creative work and the machine does the administration… The stage is set for an evolutionary growth of new social engines, (Berners-Lee and Fischetti 1999:172-175).

Ideas about the organisation and governance of open educational resources was at heart of the design of the *Co-Curate North East* project as it emerged in 2013. Funded by the Arts and Humanities Research Council it sought to develop a new type of digital platform or machine that could aggregate different open, online educational resources around social identity and heritage. Based at Newcastle University but with partners which included Tyne and Wear Archives and Museums and Woodhorn Museum it worked with twenty educational and community partners to co-design both the digital products and the research process. The co-design and development of the site initiated a set of conversations and operations around data and how it was narratively organised through the internet. The design itself allowed for the streaming and aggregating of already existing historical resources in open collections of data but also the emergence of newly generated archival and collection materials from the twenty groups.

Not only do new digital platforms sustain data forms into the future through the ongoing collection and maintenance of data collections it can also allow for new 'meshworks' of data. The meshing of data resources, their reassembling, recomposition, and re-narration is central to the operations of the digital work of *Co-Curate*. The site itself is linked through tagging and metadata to multiple other sites, collections, and machines. The development and design of our project has been supported by new ideas of what a 'social machine' might look like and do (Berners-Lee and Fischetti 1999). Certainly the emergence of new ways of self-organised learning is central to the design and practice of the Co-Curation machine, what it both currently displays, and its future possibilities (Dolan et al

2013, Mitra and Dagwal 2010, Mitra and Quiroga 2012). The idea of the SOLE (Self-Organised Learning Experience) was integral to the development of the project as the central educational partners originated in SOLE work with Newcastle University – and specifically what kinds of computerized tools might enhance those learning and navigation experiences. This paper delineates the initial process of project design and its implications for the idea of socialised machines. It specifically examines the nature of machines of 'memory', the ways in which we can think of navigation using machines and through machines, and the novel ways in which we can collect, aggregate and visualise data on those machines. It closes with some initial findings from the design stages of the project and its implication as a tool of digital education as the machine develops as a system and way of connecting data with learners.

2.Machines and society

> Nature builds no machines, no locomotives, railways, electric telegraphs, self-acting mules etc. These are products of human industry; natural material transformed into organs of the human will over nature, or of human participation in nature. They are *organs of the human brain, created by the human hand*; the power of knowledge, objectified. The development of fixed capital indicates to what degree general social knowledge has become a *direct force of production*, and to what degree, hence, the conditions of the process of social life itself have come under the control of the general intellect and been transformed in accordance with it. To what degree the powers of social production have been produced, not only in the form of knowledge, but also as immediate organs of social practice, of the real life process, (Marx 1973:706)

The rise of the medieval machine and medieval engineering and architecture more generally was related to new relations of production (Gimpel 1983, 1992). The development of new digital engines are themselves enmeshed in new forms of social production and social relations. These new computerised systems of administration, learning and creative facilitation are themselves what Berners-Lee and Fischetti call 'social machines' (1992). These machines, like the cathedral or the feudal watermill are not the products of nature but as Marx says – 'organs of the human brain, created by the human hand; the power of knowledge, objectified,' (Marx 1973:706). Social knowledge has become a 'direct force' of production, of social practice in real life. For much of subsequent critical theory, and Theodor Adorno specifically, the idea of the machine was one which administered *over* human beings, and one in which humans were subjected to the role of component within the 'monstrosity of absolute production' (1978:15). For Adorno 'Technology is making gestures precise and brutal, and with them men. It expels from movements all hesitation, deliberation, civility. It subjects them to the implacable, as it were ahistorical demands of objects' (1978:19). The 'implacable, as it were ahistorical demands of objects' is the beginning moment of our account. We argue that in designing and co-producing our version of a social machine new forms of sociality, navigational possibilities, and aesthetic data's are delineated, hinting at not only future features of developing social machines but also new ways of thinking about social life and practice. Rather than subordinated to the implacable demands of objects new human navigations of machines allows those objects and histories to be recomposed as we recompose our own sense of social and historical identity.

The transformation of archaic social machines (Cohen 2003, Gimpel 1983, 1992) into new technical manners and design formats was always related to the question of the social in machines (Woolgar 1985:557). With the rise of the internet and the 'semantic web' new forms of meaning are produced and reproduced and circulated (Berners-Lee and Fischetti 1999, Hendler and Berners-Lee 2009). The *Co-Curate* web tool as a storytelling social machine brings together aggregated collections of history resources, archives and data. It is itself enmeshed in the generation of new forms of meaning and narrative as collections (official and unofficial) of resources are brought together in new meshworks. Local knowledges and archives become disembodied and dematerialised as the internet makes them extraterritorial from their place of origin. Artefacts become re-materialised as the engine allows the production of 3D prints from historical artefacts and pictures. New ensembles and exhibitions of materials become curated by new groups of practitioners within and without 'memory institutions'. Further, new journeys are made through that data, journeys which can be analytically tracked and understood as those very journeys test out the boundaries and seams of the machine and what it brings together. New social relations are forged as people work together on materials. New parliaments and republics are built on and within and through the social machine.

But those affordances and socialities are also about new ways of visualising data (Barceló 2007) and new ways of thinking about storage, curation and sustainability of data (Ashley 2013, Higgins 2011, Waibel 2007). The analytical tracking of 'Journeys through data' (Beer and Burrows 2013, Savage 2013, Ruppert, Law and Savage 2013) can create surprising new ways of thinking about the metrics and the practice of social navigation. It can also illuminate the way that enquiry actually happens rather than how it is supposed to happen particularly around the idea of self-organised learning and the kinds of digital platforms that might support that learning (Dewey 1938, Dolan et al 2013, , Mitra and Dagwal 2010, Mitra and Quiroga 2012, Sfard 1998). Curriculum development and specific educational technology approaches (Facer 2011, Facer 2012, Facer and Sandford 2010) are linked to new forms of digital enquiry and digital civics. New civic identities and enquiries are profoundly enmeshed in new ways of thinking about digital archives and the idea of community. Digital born objects and the digitalisation of already existing artefacts challenge our ways of thinking about identity and the kinds of narratives that can be supported by archives (Boast et al 2007, Bowen and Petrelli 2010, Cameron 2007, Morse, Macpherson and Robinson 2013, Povinelli 2011, Terras 2010, Waterton 2010).

As social machines develop they create the capacity for ever more complicated and circuitous journeys of and through data. New social machines open up new possibilities for the multiple aggregation and search possibilities of data with new data visualisations and new ways of both performing data and operating upon it. Potentially as social machines develop they can hold performances of plays or historical events, each movement Laban-notated, each inflexion of dialect and accent expressed in text, each timbre or rhythm annotated. They could link through an individual gesture of a hand in film to critical commentaries, sound archives, the multiple historical performances that have taken place before, the metrics of each and every resource with wiki features allowing constant and multiple interactions and constant and multiple new socialities emerging. The vast semantic machine linking to other social machines, historical archives, catalogue numbers, the genetic composition of its audience and producers. In other words the co-production of the whole machinery of real life.

The pace of co-design and co-production of social machines is limited by technical limitations, knowledges of those technics on the part of communities, and problems in forging new modes of collaboration between designers and users. Certainly in terms of memory and collection interfaces there are multiple issues of intellectual property and questions of ownership and 'speaking for' artefacts that can be aggregated and recomposed through the machine. This includes barriers to exchanging knowledge on social machines, commodification, gifting, open access and so on where the development of interactive technologies allows the performance of data in different ways. The co-production of new civic and social forms of exchange – specifically in those 'third spaces' between the university and communities (Hudson 2013) create new creative ways of sharing and enhancing knowledge including the crowdsourcing of transcription, funding, and archiving (Tarte et al 2014). New visualisations of data, new performances and re-narratings of collections, are all part of the new 'automatic play' of machines. Individual constituents and artefacts can become part of new composite assemblages and amalgams which stretch the capacity of both the machine and the data into new directions and forms. At the same time, the speed of development and the logic of social machines raises questions both about the provenance and the sustainability of the curated data. This hints at issues of both fragility and sustained access as well as the collage effects when brought into collision with other types of interfaces and collections.

The seams and the boundaries of the social world of the social machine are tested by the designs and navigations of its developers and users – in our case developers and users as co-designers of the digital collections and experience. This social labyrinth, at once constructed by social beings and traversed by them, displays sets of lines of traverse – desire lines across its labyrinth. This interaction between desire and space and structure displays the new kinds of social and digital experimentation made possible by the socialised co-produced engineering of memory machines such as ours.

2.The emergence of social machines

Judith Donath (2014) has examined the interactions between artefacts and vast social machines in her new analysis of the prospects for machines and social computing. The new social machines are visualising new social landscapes and interactions allowing for the reworking and recomposition of the sense of social and human identity. Donath argues that there are three design goals for social machines – innovation, legibility and beneficence (2014:viii-ix). But as Steve Woolgar once noted - where exactly is the social in the machine (Woolgar 1985)? For Donath 'The "machine" in the title is the computer. In its incarnation as a "social machine," its abstract binary digits are programmed to transform it into a communication medium and a setting for interactions, an electronic place to see and be seen', (2014:vii). The central problematic about how we 'live' online as social beings lies in exactly what we are designing and experimenting with including how the social works and what kinds of knowledge humans need to circulate and share. But for Donath

> The word "machine" also has harsher overtones. "Thinking machine," "dream machine," "social machine"—these phrases are provocative because they sound self-contradictory. A machine is inherently sterile, inanimate, automated, unthinking. The "social machine" under its sinister interpretation processes people for their data; it automates relationships, atrophying the human dimension. As designers and users of these technologies, we need to recognize this darker side to ensure we are instead creating tools for the benefit of those who use them, (2014:viii).

Certainly in terms of the tracking of human subjects (Beer and Burrows 2013, Savage 2013, Ruppert, Law and Savage 2013) social machines offer little governance and interaction to the tracked subjects. The emergence of co-designed and co-produced social curating machines such as *Co-Curate* adjusts the machine in the direction of community governance and beneficence. It is worth elaborating the aims of the *Co-Curate* project and the machinery it hoped to develop.

Co-Curate North East was intended to think about the sustainability of digitalised data resources both collected and newly generated by twenty schools and communities in the North East of England. It was an 18 month experimental research and co-production project funded by the Arts and Humanities Research Council. It allowed for both access to and enhancement of already existing museum collections in the North East and supported new digital ways of accessing materials and co-curating and exhibiting those materials as open educational resources that could be used and added to by subsequent communities and schools. Problems of being able to physically travel to and access 'material' archives and collections were resolved by bringing resources into one machine. The development of the curatorial, research and design skills of communities and school developing their own 'citizen-researchers' as a key part of developing the machine as a useable, interactive digital tool.

As the project developed its community co-production and co-design work with 'memory institutions' such as Tyne and Wear Archives and Museums and Woodhorn Museum new experimental approaches were developed to enhance the governance of communities and the social 'beneficence' of the project as a whole. The project then developed in three broad ways. Firstly, developing co-curation techniques with the 20 co-curating groups. Secondly, facilitating relations between those groups and institutions. Thirdly, developing and co-creating a new social memory machine which could aggregate existing 'official' collections with newly generated 'unofficial' materials from within the co-curating groups allowing for new assemblages and visualisations of data and resources and their narrative recomposition temporally, spatially and in conjunction and dissonance with other artefacts and materials. This co-production of a new abstract memory-machine allows then for a series of experimental operations with the data on behalf of those communities, reworking the very sense of what memory entails as artefacts are practised upon – artefacts which both display and dispel the kinds of narrative recompositions which we operate over/with them as co-curators.

3.Memory and social machines

> The open nature of the web as medium (web pages are computer files which can always be edited) means that web sites never have to be complete; and they rarely are. The sites always grow. New links are being added to what is already there. It is as easy to add new elements to the end of a list as it is to insert them anywhere in it. All this further contributes to the anti-narrative logic of the web. If new elements are being added over time, the result is a collection, not a story. Indeed, how can one keep a coherent narrative or any other development trajectory through the material if it keeps changing, (Manovich 1999:82).

If we accept that memory is central to social identity, then the ways in which we socially remember are decisive for the kinds of identities and social beings which are produced. New social 'memory' machines then offer new opportunities for the presentation of old and newly generated memory

artefacts and new forms of aggregated and distinctive social identities. As Henri Lustiger Thaler notes

> From a sociological standpoint, if we accept the premise that memory offers a conceptual framework from which to understand the relational qualities – and inequalities – of 'those who remember' the very task of understanding how memory functions must be factored into deciphering fundamental processes of change occurring at the ever changing nexus of relations between tradition, post-traditionalism and late modernity, (2013:907).

The question of how memory functions through machines is central to the communities that co-curation works with. The question of the social in the social machine raises the clarity of the issue of whether we can then 'do a sociology' of the social in the social machine. Lustiger Thaler argues that new types of inquiry into memory and how it is presented necessitates new interdisciplinary collaboration 'poised at the intersection of collective and individual or personal memory: the substance of sociological inquiry,' (2013:908).

If the social machine is that very intersection between competing social collective memories and personal access and identity construction then the emergence of 'digital heritage' is as important as access physical and material memory and museum spaces. The question of digital heritage work has to challenge previous ideas and concepts about memory and what 'heritage' is predicated upon, and what form 'studies' of heritage might appear as (Parry 2011:342). Further, the development of user-driven, interactive machines are also about the interface between vast, abstract historical forces represented through individual artefacts and the individual social beings in communities who are trying to understand themselves as a product of those forces and using the digital as a 'storytelling vehicle' (Howes 2007, Mouw and Spock 2007). The development of the *Co-Curate* social machine as a storied, narrative machine was essential to the capture of this macro/micro interface. Collecting and telling stories in different visual and textual formats was central to the success of the co-curation experience. As Pickering and Keightley have pointed out

> those involved in memory studies have failed to engage, again in any extensive way, with oral history, mainly because of a leading preoccupation in memory studies with collective 'trauma', national history and heritage, grand-scale ritualistic social practices, and macro-cultural memory, rather than with individual and small group micro-processes of remembering' (Pickering and Keightley 2013:4).

The interactive, 'micro-processes' of remembering through 'user-driven' design and use of machines are exemplified in the idea of intersection or traffic/navigation as we shall see below. But this intersection is a site where the individual and collective interact, and where the traffic between them has to be accounted for (Pickering and Keightley 2013:8). Paul Basu calls this place of intersection and interaction a 'cultural memoryscape' or 'mnemonic terrain' (Basu 2013:116), a spatial metaphor which hints at the very question of collection and navigation that are continuously addressed by social machines.

This 'memoryscape' at the intersection of the macro and micro was one which often had at its centre the spatial and historical organisation of the museum as an institution. Community and meaning and purpose have been central to the organisation of collections in museums and supporting the interaction between artefacts and audiences central to their civic purpose. As

Elizabeth Crooke has noted in her work on 'intersecting spaces' in museums - 'Not only is the museum a place of 'intersecting histories'. It is also one of intersecting meanings. The meanings are built upon the idea of the museum or objects as a 'contact zone'' (2007:133). Often, curators are seen as the gatekeepers of the object and its significance with museums generating ordered and systematic knowledge of the world. But the rise of the digital has allowed for new reassemblings of that knowledge (Keene 1998:2-3). For Suzanne Keene this allows not just for the digital surrogates of existing materials but new modes of access 'without a dredge of the organizational memory' (1998:23). Critically, digitalisation is about 'Connectivity: wires not walls' (1998:16).

These new modes of connectivity allow for the elaboration then of what Louise Ravelli calls the 'multi-modal texts' of exhibitions and the museum itself as text (2006:151) and the multiple electronic 'approximations' of the real world (Thomas 2007:1). Digitalisation doesn't just expand meaning but creates what Peter Samis calls the 'semantic context for perception' (2007:20). This is what Matthew MacArthur has called 'Mind's on' interactivity (MacArthur 2007:62). But in that interactivity the question of the digital surrogates and what they mean and represent becomes ever more problematic. As Ross Parry notes;

> Knowing (and caring) about the difference between a collection of digital things that appears like a 'museum', and a museum that is presenting digital things based on its collection, comes down to questions of trust and definitions of authenticity…If through their long histories museums have been principally about material things (physical visits to physical objects) what possible role could there be for a machine that can only display information, surrogates and simulacra, (Parry 2007b:57).

For Parry the 'recoding' of the museum by the computer has been part of the reimagining, rethinking, reshaping, and reframing of the museum as a set of collections and narratives (Parry 2007:140). But does the computer and the web have what Manovich has called an 'anti-narrative logic' as a set of incoherent collections (1999:82)? Or is it co-curation and the intervention of communities in reassembling, re-narrating, and reforming collections that creates the 'storiedness' of social machines of memory and collections.

4.Social machines, Intersections and navigating co-curation

> For some, the idea is to create new kinds of digital objects – which may appear as ancestors, for example, or as emplaced beings only within certain landscapes. These figures might be embedded in modes of sociality that users must negotiate as they interact with the digital environment: sometimes objects may become subjects, depending on who is looking at them or from where; others shape-shift, show different faces or simply disappear. The aim, in short, is to transform a single hegemonic system that dictates the universal forms that digital information must take, as well as the means of its circulation, into multiple systems of ontologies inflected with certain kinds of difference – especially the kinds we are accustomed to calling 'cultural' (Salmond 2012:212).

These questions of stories and narratives in digital experiences and collections are themselves journeys through data, and telling stories through data *if it was the case that the system, the data, and the navigation across could be pre-programmed and co-designed in advance*. One of the central lessons of *Co-Curate* as a project so far is that although there was some sense of advance design,

perhaps even avant-garde design of systems around open access to materials, the co-design aspect of the system is an ongoing, developmental, community-driven, process of experimental design.

The analytical tracking and understanding of the uses of social machines is important for testing the usefulness and boundaries of the machine world. Just as in 'open world' and 'sandbox' games where play is determined not by pre-determined and structured rules but by the nonlinear gameplay of choices, strategies, and 'world-building' the social memory machine is a form of 'emergent play' and recomposition. It is therefore, across the labyrinth of the social machine, important to understand the forms that that traverse might take in terms of social navigation, serendipitous routes, and the 'social trail'. Understanding those 'desire lines' or 'desire paths' across the digital terrain is about understanding the affordances offered by machines, the limits of their world, and the tracking of their use. This is particularly important in terms of navigation which can explore the fractures and the 'seams' of systems (Chalmers et al 2004) where understanding social navigation is part of a design process 'that allows for picking up explicit or implicit social trails and practices in a useful way' (Chalmers et al 2004:171). The creation of social spaces on designed systems have to take into account the usage and subsequent re-design of the system. For Chalmers et al

> Our approach is to regard seams as something that can be socially constructed and shared between users. Instead of always striving for seamless connections and 'perfect' representation, seamfulness will be a guiding design principle. Users should be actively involved in forming and supplying the content of the digital social medium, this treating seams as features or phenomena that are created in and through social interaction (2004:172)

The use of social spaces and navigation exposes and reveals the seams and the limitations of systems that can then be appropriated into new versions of the machine (Chalmers et al 2004:177). The idea of systems that are architecturally constructed or as landscapes that can be traverse d is fundamentally a visual process of interactivity and design. The social machines that are produced are visualised explications of complex social forces and relationships.

5.Visualising data/artefacts on social machines

> An artefact, as is accepted, is a multitude of data points, an infinity of possible attributes and measurements. Which ones are made and held to constitute its identity depends conventionally upon method and the questions being asked by the archaeologist. But we also hold that the artefact is itself a multiplicity. Its identity is multiple. It is not just one thing. The artefact does not only possess a multitude of data attributes, but is also itself multiplicity. We come to an object in relationships with it, through using, perceiving it, referring to it, talking of it, feeling it as something (Pearson and Shanks 2001:99).

If we accept that artefacts are composed of multitudes of data points, that those metrics can be described and that there are plausible narratives that can be from them then this also means that wider more abstract assembles of those artefacts are even more multitudinous and rich. The new combinations of assemblage and collage can create new narrative logics out of artefacts and new stories emerge. The constant 'disassembly' as Pearson and Shanks note (2001:52) of the fragments collected and presented through social machines in its re-forming of narrative logics hints at a textual basis of presentation. However, the display of artefacts is both storied and visualised – with the visual artefacts narrated into stories in the precise assembly and combination of them into

structures of explanation. But as Barceló notes in his study of the digital visualities of archaeology, these modes of visualisation are not just about 'picturing' artefacts;

> "Visualising" is not the same as "seeing," but an inferential process to aid the understanding of reality. The idea is not to take a "picture" of the artefact, but to decompose empirical information in terms of its location marks (shape, size, location) and retinal properties (texture, composition). That is, geometry is used as a visual language to represent a theoretical model of the pattern of contrast and luminance, which is the strict equivalent of perceptual models of sensory input in the human brain. All this means is that "visualising" the real world is not the same as "picturing" it, because the model and the graphical means for creating and visualising the world are distinct…This is the task of our "automatic" archaeologist: to create a geometric representation of the regularity present in a data set: joining points with lines, fitting surfaces to lines, or "solidifying" connected surfaces (Barceló 2007:446).

The graphic and geometric representation of a data artefact, data set, or data 'montage' displays both the multiplicity of the individual properties of the artefact, but also the multiplicity that those properties offer in terms of the narrative logics extracted from them. The digital artefact as a reproduction or surrogate of a real object displays the properties of the object - 'its form, fabric, shape, aesthetics, and history through interpretation. In creating a surrogate, the gestures, memories, customs and intentions, and scars of their life histories are faithfully replicated in virtual space taking on the solidity, surfaces, edges, and textures of the real to ensure a more certain recovery of history, time or aesthetic experience' (Cameron 2007:55). For Fiona Cameron the surrogate object raises issues of testimony, provenance and 'authoring signatures' as the object becomes reproduced and distributed in its digital visual form (Cameron 2007:67). This makes the narrative logic of visualisation all the more important – that to produce plausible, coherent stories means the construction of what Povinelli calls a 'digital index' of metadata that can mark an object and its manifestations (2011:153). This intelligibility and the manner in which we search for a narrative logic within artefacts is crucial to the intersection between individual semantic perception and wider social and historical formations (Hudson 2014). What Whitelaw calls the informational 'substrate' of data is part of processes of intelligibility, context and organisation of placing data within narratives which are more than just informational metrics (2008:2).

6.Conclusions: Co-Curate North East as social machine

The organisation of the data 'substrate' into coherent stories, the explication of narrative logics emerging from data, and the navigation of data and its stories means that the idea of a 'digital index' is central to the design of social machines. Using and co-designing the machine as a digital index has been one of the major aspects of work in schools with students working as designers, product developers, researchers, curators and exhibition practitioners – often working on these roles with both the educational and heritage researchers and museum practitioners.

The process of aggregating data resources in order to exhibit and display different stories through the rearrangement and montage of data has been central to the development of co-curation practice within school and specifically within self-organised learning environments. This 'meshwork' has involved uploading newly generated heritage and historical data resources from within the school groups and then its recombination with 'official' and publicly available open educational

resources from other collections. Using the 'substrate' of the machine with the multiple 'superstrate' or stratifications as multiple 'builds' and 're-builds' hints at the architectural nature of a system that can only keep growing, linking and connecting systems, schools and communities.

The student co-design of the site has seen the students develop their design skills with critiquing and elaborating upon the nature of the site and their own generated sections of it. Further, the site involves the capacity to analytically track their operations upon the data and their navigations and journeys through the data thereby experimenting with the seams and the boundaries of the world of the machine. This allows for an understanding of both the serendipitous and intentional journeys across and through the machine world to other social machines with which it is linked and understanding practices upon the site itself as a way of improving the system through user-driven experimental design.

Initially co-designed as a way of thinking about local identities, places and heritages, specifically in schools, the navigation through big data allows the elaboration and construction of both miniscule and grand narratives about that data. By experimenting with data, and with stories extracted from that data, it connects both the individual and their group peers with abstract histories and social forces around memory linking their activities around 'minds-on' macro/micro interactivity. Full analytic data from the project is emerging as the project closes its initial phase in March 2015 including interviews, ethnographies, and machine analytics. However, there are emergent themes/questions nascent within the initial experimental stages of the project that are important to note in terms of the future of social memory-machines.

Firstly, how far self-organised learning in schools needs specific digital tools and whether the open nature of the internet and current social engines like Google or Wikipedia allow for sophisticated and rich searches and journeys.

Secondly, and linked to the first, is the question of how far aggregating vast collections of data in one place or system is useful for a specific learning theme in the curriculum such as machine like ours based around heritage and identity and located within one specific area.

Thirdly, the open generational model of the machine allows for its infinite extension in to other areas as materials are generated and it connects to other social machines. As the system becomes so abstract how far can highly localised and microscopic modes of governance such as community or school groups still support co-design and control of the system.

Finally, how can social machines account for the questions asked of it and the operations performed upon its data? The social machine allows for the play and interactivity around often abstract 'big' questions but not in providing vast resources to support specific answers. If our experimental work on the elaboration and understanding of desire lines across our specific social labyrinth means anything it lies in its attempt to find new ways of generating the questions we ask of it.

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