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#### 02. EXPERIMENTS IN (SOCIAL) SOFTWARE CURATING: REPROGRAMMING CURATORIAL PRACTICE FOR NETWORKS

Submitted by Joasia Krysa on Sun, 09/14/2008 - 16:00

#### By Joasia Krysa

Abstract

The paper addresses the issue of new developments in the field of curating in the context of information technologies. It explores the emergence of an interdisciplinary approach that directly links the field of curating with computer programming and a relatively recent interest in software art. Although there is much contemporary critical work and practice that is described as art-oriented programming or software art, the paper responds to a perceived gap in discussions about software curating. It is important to emphasise that in this context software curating is not to be understood as the activity of curating software art works (in other words the activity of bringing software artworks into public domain) but as integrating software and programming in the curatorial process per se. Furthermore, the paper reflects upon the recent rise of popularity of social technologies and their relevance for curating. The underlying suggestion is that curating responds to this by developing new forms that increasingly involving sociotechnological networks and that can be characterised as socially driven and distributed over networks.

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### 02. EXPERIMENTS IN (SOCIAL) SOFTWARE CURATING

Submitted by Joasia Krysa on Sun, 09/14/2008 - 16:00

With changing models of cultural production and the art-culture system in general, the notion of what constitutes curatorial practice has significantly evolved. The proliferation of curating (and curators) from the 1980s and 1990s onwards offers far more diverse descriptions of curating - with freelance curators, or those outside of institutions (independent curators) operating in multiple roles (such as publishing, collecting,

installing, designing, etc), and developing idiosyncratic methodologies for curating.<sup>1</sup> This can be partly linked to an increasing demand for art-mediation on the part of artists in a system that places economic value on contemporary art production (Funken 2004: 23). In a general sense, curators assist in the production of economic and non-economic value. Other definitions of curating that have emerged in a more current context point to its understanding as a technology, or rather one of the technologies - a form of production and a creative activity in itself - used by cultural institutions to frame and juxtapose artworks. This position defines curating as "a collaborative practice that establishes connections, creating mashup and collage-work, a technology to reinforce the shift away from the focus on artwork as the work of individual genius" (Rehn 2007).<sup>2</sup>

Paul O'Neill notes that: "the term curator as "a form of creative production" already began to be applied to a few independent practitioners in the 1960s working beyond institutional posts. Thisalso marked a moment when the curator-as-artist phemomenon began to gather pace. What differentiates discussions around exhibition-making after the 1960s from those preceding them is that they move beyond self-criticism by artists to include the praxis of exhibition organisers, gallerists, critics and curators, who not only generated alternative, innovative and critical forms of exhibition, but also questioned the traditional understanding of what constituted the boundaries of art's production. Through various adaptations of the exhibition form, the curator began to take on the artist's creative mantle, whereby the traditional roles of artist, curator and critic were collapsed and conflated." (O'Neill, 2007)<sup>3</sup>

This shift represents an understanding of curating as part of wider field of cultural production that includes a range of other agents, including artists, critics, collectors, and so on. The expanded understanding of curating is further enhanced by curatorial engagement with emerging technologies such as the Internet and the Web in the 1990s and more recently social technologies such as wikis, lists, blogs, tagging, online social networking platforms and software more generally. Susan Morris in "Museums and New Media" (2001) explains that the expansion of functions of museums, prompted by new media and new artistic practices, changes the role of curators too - from the "keeper" of art works to a more active role in commissioning and creation of new works; to the role of producer, critic, collaborator and facilitator (2001: 14-16). The extended curatorial practice involves a multidisciplinary approach in which curators serve as "go-betweens" or mediators and demonstrates a more general shift of emphasis from creating content to filtering content and presenting a context for it. This runs in parallel to an increasing emphasis in art and culture on "distribution" and reflects the changing pattern of work and cultural production more generally. As a result, museums and art institutions can be seen to operate more and more as networks, and as part of networks. This is also the case with curating, in that the curator is part of wider networks that serve and contextualise content. The paper reflects on these changes and draws attention the emergence of new curatorial forms that involve software (and more generally programming) as an integral part of curatorial process that is increasingly dynamic, distributed over networks and is inherently social in character. Consequently, the paper situates curating within the broader context of software cultures and coding practices.

What is distinctive about this approach is how discussion shifts from the concept of programmability and the algorithm as an organising principle of artwork (in a functional and/or technical sense) to a consideration of programming and code as cultural and

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aesthetic expression - under the broader and more contemporary term "software art practice".<sup>4</sup> Central to the discussion is the more general idea that the act of computer programming itself can be considered *artistic activity* and software can be considered *an artwork* as opposed to the activity of programming and software in their functional dimension as a means to facilitate the *production of an artwork*. Such a differentiation, between software as functional tool, and software as cultural production in itself, and as art form, is common to the software art scene. This is explained by Olga Goriunova and Alexei Shulgin in their introduction to the *read\_me festival 1.2* catalogue, when they state that:

'artistic software is, first and foremost, software created for purposes different than traditional pragmatic ones. Such programs are not seen as tools for the production and manipulation of digital objects - from online bank accounts to works of art - they are works of art in their own right.' (2002: 6)

Software represents both technical and cultural processes, and these two aspects cannot be disentangled.<sup>5</sup> In general terms, software is defined as a set of formal instructions, or, algorithms, a logical score that can be translated into a computer program and executed by a machine. It also includes associated documentation concerned with the operation of a data processing system (e.g. compilers, library routines, manuals, and circuit diagrams). There is a distinction made between "system software" (the operating system and database management system) and "application software" (any program that processes data for the user such as a word processor, etc.). *In A History of Modern Computing* (1998), Paul E. Ceruzzi emphasises the complexity of the relationship between software (the set of instructions that direct a computer to do a specific task) and hardware (a general-purpose machine on which software runs):

'A computer system is like an onion, with many distinct layers of software over a hardware core. Even at the center - the level of the central processor - there is no clear distinction: computer chips carrying "microcode" direct other chips to perform the processor's most basic operations. Engineers call these codes "firmware", a term that suggests the blurred distinction.' (2003 [1998]: 80)

Conventionally, with the installation of digital artworks, the work of the programmer is relatively hidden and under-acknowledged as a creative practice in its own right. This issue is emphasised by Florian Cramer, who states:

'The history of the digital and computer-aided arts could be told as a history of ignorance against programming and programmers. Computer programs get locked into black boxes, and programmers are frequently considered to be mere factota, coding slaves who execute other artist's concepts. Given that software code is a conceptual notation, this is not without its own irony. In fact, it is a straight continuation of romantic philosophy and its privileging of aesthesis (perception) over poeisis (construction) cheapened into a restrained concept of art as only that what is tactile, audible and visible.' (2002: 18)

The parallel can be extended to curating by considering how on visiting the traditional white cube of a gallery or museum, the work of the curator (or artist for that matter) is relatively hidden from the display of the artwork. Emerging curatorial practices (examples described later in this text) serve to demonstrate how the curatorial process is revealed, much in the same way as the work of the artist-programmer. What this paper aims to highlight is the emergence of an interdisciplinary approach that directly links the field of curating (often understood as an activity of artistic programming) with computing (more specifically with the activity of computer programming) in the context of software art. Although there is much contemporary critical work and practice that is described as

software art (or art-oriented programming), the paper responds to a perceived gap in discussions about software curating. The approach reflects the recent shift of attention to the cultural significance of software and programming, and extends its relevance to curating. Analogous to the distinction between software as a tool to produce art and software as artwork, an underlying assumption of the paper is an understanding that software can not only be used as a tool for curating and a display platform but also, and importantly, that it can demonstrate *curating in itself*.

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### 02. EXPERIMENTS IN (SOCIAL) SOFTWARE CURATING

Submitted by Joasia Krysa on Sun, 09/14/2008 - 16:00

If, in a conventional sense, curating follows a particular model of selecting, organising, displaying, contextualising and documenting of art works, then emergent curatorial forms attempt to rethink this model for the context of networks. What these forms suggest are new ways of organizing the curatorial process, new presentation platforms and new conceptions for the involvement with users - artists, computer programmers and wider audience alike - exploiting and in keeping with the properties of sociotechnological networks.

The history that led to the emergence of this distinctive approach to curating can be linked to number of parallel developments. Firstly, there is a long history of curators organising exhibitions of art that involves technology, such as Cybernetic Serendipity (ICA, London, 1968) or Software (Jewish Museum, New York, 1970). The Cubernetic Serendipity exhibition (curated by Jasia Reinhardt), although not the first computer art exhibition as such (earlier exhibitions and project were held in US and Germany), is seminal in the history of computing and art.<sup>6</sup> The particular significance of the project was in that rather than focusing on computer generated work it took a wider focus and drew attention to art in combination with cybernetics, a relatively new field of scientific inquiry concerned with - in Norbert Wiener's description - "the entire field of control and communication theory, whether in the machine or in the animal" ([1948] 2000: 11). It was organised in three distinctive sections: "computer generated work, cybernetic devices-robots and painting machines, and machines demonstrating use of computers / history of cybernetics" (MacGregor 2002). Around the same time, the exhibition Software, Information Technology: its new meaning for art (curated by Jack Burnham) explicitly used the term "software" as a metaphor for ideas, processes and systems as

opposed to the "hardware" of traditional object-based practices.7 The exhibition included an eclectic combination of art and non-art from technological applications and experiments (computing and electronic research applications) through to conceptual art works and those overtly dealing with technology.

Other historically significant exhibitions and projects that dealt with an increasing impact of communication technologies on art were: the Art and Technology project developed by Maurice Tuchman and Jane Livingstone at the Los Angeles County Museum in the period of five years (1966-1971), the Information exhibition curated by Kynaston McShine at the Museum of Modern Art, New York (1970); and research projects by Experiments in Art and Technology (EAT) group (set up in 1967 by engineers and artists Billy Klüver, Fred Waldhauer, Robert Rauschenberg, Robert Whiteman) and by the Center for Advanced Visual Studies at MIT (founded in 1967 by Gyorgy Kepes). A further example is the exhibition of computer generated art Tendencije 4 in Zagreb (1968) which along with published at the same time magazine on aesthetic and media theory Bit International was recently revisited in a major "retrospective" bit international: [Nove] Tendencije computer and visual research curated by Darko Fritz in Neue Galerie am Landesmuseum Joanneum, in Graz (2007). More currently, the exhibition CODeDOC (2002) curated by Christiane Paul for the Whitney Museum's artport website (and later extended for Ars Electronica Festival in 2003) is significant in shifting curatorial attention directly to source code (displayed in the exhibition alongside its results as executed code).8

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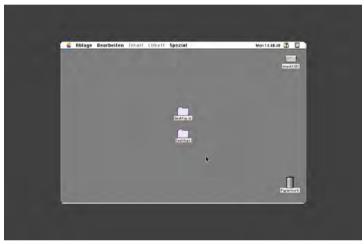
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#### [CODeDOC / screenshot / 2002]

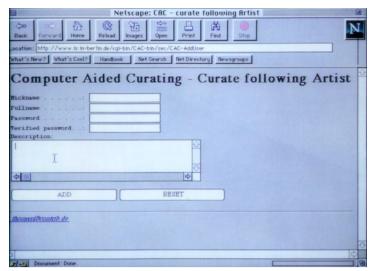
In parallel, there is also a history of critical tradition of artists directly engaging with computational technologies and the openness of technological structures (Internet and software) - artists essentially working like curators - that historically have made some of the most significant interventions in the field. For instance: Alexei Shulgin's *Desktop Is* (1997-1998), Eva Grubinger's *C@C - Computer-Aided Curating* (1993-1995), and more recently, Robert Lisek's *FACE* (2007, in progress) and Pall Thayer's *CodeChat* project (2007).<sup>9</sup>



#### [Desktop Is screenshot / 1997]

Desktop Is was set up as a website displaying images of computer desktops collected by the artists through an open public call; the artist set out specific rules of public participation, collected and displayed "works" sent by public, thus acting in the manner of a curator. An even earlier example of a similar approach was *C@C - Computer-Aided Curating* a software-driven tool and a curatorial online system developed in collaboration with computer programmer Thomax Kaulmann. The system not only enabled artists to create their own works in online "artist-studios" with built-in editing tools, but also provided a context for presentation and selection of other artists' works creating the structure of a social network. The website also included a discussion forum for the exchange of comments by the public and curators, and spaces for art dealers to present and promote their activities. Christiane Paul, in "Flexible Contexts, Democratic Filtering, & Computer-Aided Curating" (2006) comments on the project in the following manner:

"In terms of curation, C@C proposed a fluid environment that did not separate production, reception and presentation, and ideally enabled artists and the public to play a curatorial role to varying degrees. In this case, the software was mostly a supportive tool and framework and did not assume a curatorial function per se." (2006: 100)



[C@C - Computer Aided Curating screenshot / 1993 / courtesy of evagrubinger.com]

A more contemporary version of such an approach, both in terms of chronology and technological system employed, is FACE (Free Artists Concepts Exchange). The project can be described as a web enabled system for exchange of concepts, display of work, collaborative production and experimenting, and plays with "the meaning of media objects by creating, transforming the downloaded media objects, which are in a sense "source code" to work with". It builds upon the technical system that uses the structure of nodes and DAG (directed acyclic graph). This allows the user to represent and manipulate concepts and projects and the system facilitates an online, flexible and collaborative platform. The emphasis is on the collaborative aspect in that the curatorial responsibility for the architecture of FACE and its structural parts (i.e. nodes) is distributed across its participants. Furthermore, the process of creation, organisation and dispersal of concepts is represented by the flow of graphs, where each concept has a dedicated node, or a configuration of several nodes in the graph. The project website explains that while "the content published by participants is located at the edges of the graph, the nodes represent a system of tags used by participants for indexing of content". Simultaneously, participants can control their own graph(s), as well as navigate through the system exploring graphs of other participants. The significance of this lies in the productive interrelation between local interventions by each of the participants and the network's global behaviour, and the social relations that arise from this.



[FACE screenshot of the project website (under development) / 2007]

There is an increasing tendency in this growing field of practice to emphasise the integration of aesthetic with technical aspects in works that place source code at their centre. A particularly interesting example in this respect is the *CodeChat* project that is a code-based chat system developed as a means to discuss the conceptual and aesthetic implications of coding methods in art that involves programming. The system is structured as a single Perl script to facilitate a database of text-based code files submitted as open source (or at least part of the submitted code has to be open source to allow public commenting). According to the project description, the Perl script automatically generates an html file with comment sections for each line of submitted code. The commenting system is AJAX based, driven by Javascript, PHP and MySQL. The project is structured as an open dynamic system that entirely relies on public participation expressed in an active involvement in providing content (source code) and sustaining dynamic and transformative potential of the project through the function of public

commenting. The project is particularly interesting for the context of this paper in that it combines the aesthetic potential of source code (essentially as an "artwork" that can be put on display for public viewing) with its technical and functional potential (demonstrated through public commenting on specific lines of code in order to share more technical knowledge).

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#### [CodeChat screenshot / 2007]

Although in a general sense it is not new for artists to work like curators in organising public presentations of their and other artists' works, the interesting aspect of these examples is that they present an artwork that at the same time possesses attributes of an online curatorial system that relies on public contributions. Furthermore, these examples can be considered as symptomatic of a practice that deliberately confuses the firm distinctions between artistic practice, computer programming and curatorial practice extending what was described earlier as the process of collapsing and conflating of traditional roles of artist, curator and critic.

The reverse of this holds too. Just like artists-programmers increasingly work like curators, more recently a similar tendency appears to be emerging from the curatorial field per se and there are growing numbers of overtly curatorial interventions in this respect. This tendency that emerged from the shared perception of the Web and the Internet as an increasingly independent and open platform for the production and presentation of art can be well instantiated in projects such as *Runme* (2003), *unDEAF* (2007), *TAGallery* (2007) and *Hack-able Curator* (2007), to mention only a few prominent examples.<sup>10</sup>

*Runme* is a software art repository and an online presentation platform that further develops the idea of curatorial engagement with software processes (software-based filtering of software art projects).<sup>11</sup> The repository is structured through a taxonomy of categories such as "code art", "conceptual software", "games", "generative art", and so on, as well as more intuitively through keywords that provide further descriptions of submitted projects. Both the "category list" and the "keywords cloud" are open for public modification through the identification and proposal of new terms. In this case, curatorial control is exerted on the level of setting initial parameters of categories and through a review system that allows editors or so-called "experts" to highlight the perceived "best works" with short commentaries. The curatorial process is based on a relatively open, yet somewhat moderated, database that allows users to self-submit their works - an option almost embedded in the software.

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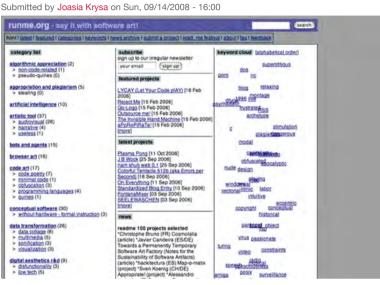
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[Runme screenshot / 2003]

The description of collaborative and participatory platforms informs much of the current critical debate around so-called social technologies, defined simply as platforms for connecting people or allowing for collaboration, and highlights how sociality goes beyond technology itself to the communities and individuals who use it.<sup>12</sup> The argument is that practices in art and technology are increasingly characterised in terms of their social impact, involving processes of intensive cooperation, and communication.<sup>13</sup> In this connection, Goriunova (2007) considers Internet platforms, such as collaborative and participatory art platforms for collective production, distribution, and presentation of works, as symptomatic of cultural production in late capitalism. The concept of a platform is explained as a website organised in a particular way, either as a relatively simple database containing artworks or a more complex portal built around a database. What is distinctive about a platform is the "creative, social, instrumental, educational and historical character it establishes and is involved with" (Goriunova and Shulgin 2006: 237). In functional terms, a platform provides a context and often tools to stimulate creative initiatives and experimental work, and furthermore acts as a space for presentation, exchange and discussion about the work. In this way art platforms can be considered "a successful system for production and management of an artistic trend, [...] something in-between a content management system, online web site, library and a club based on a networked platform". However, these online platforms can be regarded as expressions of creativity in a social context that in turn becomes the latest resource for capitalism to exploit. A particularly good example of these principles are online tools - so called social technologies such as wikis, lists, blogs, and online social networking platforms - that allow "open source" models of practice. With the current unprecedented rise of their popularity curators increasingly attempt to engage with these systems testing their potential, developing new forms of practice, and providing critique.

For instance, the curatorial project unDEAF, a satellite event of the Dutch Electronic Art Festival 2007 (DEAF) in Rotterdam, used an open and unmoderated wiki as a platform to facilitate and schedule an art event. It described itself as "an uncurated, unmoderated, self-organizational online and offline ecosystem where the content and development is driven and created by the participants". In this sense the project served to undermine the usual centralised and hierachical organisational model of curating.<sup>14</sup> The screenshot emphasises the more measured popular science description "self-organized", as clearly any claims to be unmoderated or uncurated is an act of moderation and a curatorial

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#### Who is doing what?

unDEAF is self-organized. You organize and promote your own event.

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Andrea Reyes & Marcus Graf	BLENDER	Thursday - Sunday (12:00-20:00)	HengarArea Opening Friday the 13th at 19:30		

#### [unDEAF screenshot / 2007]

Much in the same way as exploring wiki as a collaborative system for curating, blogging can be thought of as a participatory curatorial activity in the broadest sense. For instance, the curator Luis Silva (2005) speculates on the idea of "curating as blogging" and asks: What if a blog could be thought of as an exhibition? It would turn blogging activity into curating. The idea isn't new at all, but is still somewhat difficult to accept by those practising in traditional curatorial activities. [...] What has SOURCE CODE become? I (the blogger) am responsible for selecting works (and other relevant documentation for the purpose of this blog/exhibition), displaying them (their urls) and recontextualizing them from my own point of view. What I am doing in this process is basically what any curator does."<sup>15</sup> This line of thinking, that conceptually can be linked to montage techniques, informs the development of the exhibition link.of.thought\_thought.of.link (2007) for TAGallery (an online curatorial platform established by CONT3XT.NET<sup>16</sup>, where the format of the blog is applied to the idea of

curating.<sup>17</sup> The curators of the project explain their interest in blogging as a curatorial model, "where every thought leads to a new thread. Our technique takes inspiration from exquisite-corpse by the surrealists, but plays it by its own rules. Instead of concealing the part that was written we used it as some sort of chain-reaction ( ... ) Therefore each



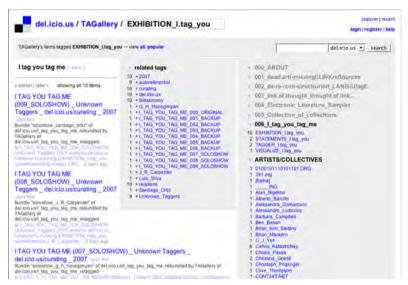
collaborator adds sequentially a new choice of links."18

#### [TAGallery/EXHIBITION\_link.of.thought screenshot / 2007]

A similar speculative idea based on aspects of social media is tagging as curating, making reference to web sites such as del.icio.us, a social bookmarks manager in which users can add bookmarks and categorise them through the use of tags to describe the bookmark in more detail.<sup>19</sup> This informs the development of another project by TAGallery, "I tag you

tag me: a folksonomy of Internet art" (for TAGallery) where the method of tagging allows

the attribution of artworks to different thematic fields. Luis Silva, curator of this online "exhibition", describes it in the following way: "If tagging creates meta-data about preexisting content, it can be seen as the creation of a discourse about it. And if that content happens to be an online artwork, tagging both allows for a subjective juxtaposition of art works and the elaboration of a critical discourse about it. Curating then. But this isn't new. This is regular curating done in a schematic way, using a different tool to get the job done. But since tagging is a social activity in its essence, giving birth to folksonomies, it allows for social curating, with social selection of works and social production of discourse about them."<sup>20</sup>



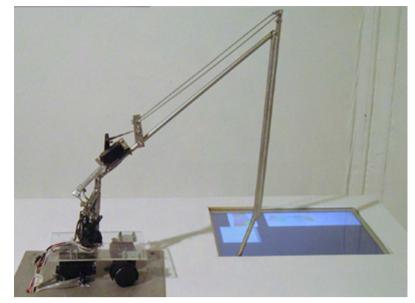
[TAGallery/EXHIBITION\_I.tag\_you screenshot / 2007]

The *Hack-able Curator* project combines curating with robotics, social technologies and the practice of "hacking" to offer an experimental curatorial system that questions the singular subjective role of the curator and the possibility of democratisation of curating

by hacking the curatorial process.<sup>21</sup> The robot curator is connected to the Internet so that it can expand the physical space into networks (both social and technological) and the entire system represents the figure of the curator. The curatorial processes involve:

'a pre-selected set of tags, the tags to search the social platform Flickr for images for use in an imaginary show, creating a pool of images to choose from, presented these images on a computer screen nine at a time, making a selection of one or more images that fits its curatorial criteria by the robotic arm via a software algorithm, informing the owner of the image about the intention of including their image in the show giving them the opportunity to opt-out, and finally displaying selected images on the project website. Simultaneously, the robot prints label stickers for each of the tags associated with the chosen image.'

The intention behind this experimental work is not to replace the figure of human curator (with a machine) but to de-construct it and reflect upon the emerging social tools for curating in a collaborative context.<sup>22</sup>



[Hack-able Curator, exhibition documentation shot / 2007]

The examples mentioned so far are by no mean an exhaustive list in this field but what they indicate is an increasing curatorial engagement with software and networks that facilitate a social dimension. Consequently, the suggestion of this paper is that the curatorial practice is now closely integrated with the dynamics of the socio-technological networks and with software that is not simply used to curate but demonstrates the activity of curating in itself. Describing curating in such terms implies a state in which curatorial system continuously interacts with the socio-technological environment: the system is opened up to the communicative processes of producers/users and to the divergent exchanges that take place and that disrupt established social relations of production and distribution. Importantly, it is a network of users that constitutes the system, along with the technological apparatus in its broadest sense. An emphasis on the user in the curatorial system is particularly significant in this context, as it is the user who dynamically determines its openness. Thus, and importantly for an understanding of the power relations involved, the software opens up curating to dynamic possibilities and transformations. What these emerging curatorial forms suggest are new ways of organizing the curatorial process, new presentation platforms and new ways of involving users - exploiting the properties of socio-technological networks and merging software and curating more explicitly. In this context, the emphasis is on software used not only as tool and display platform but importantly as part of curatorial process that is increasingly distributed over networks and is social in character. As a result, the term software curating necessitates an engagement with instructions (the program) and the writing of these instructions (programming) but also a networked system (an online software and a dynamic network of users) within which these instructions are executed.

#### Additional information

This paper draws upon my earlier work: *Curating in/as Open System(s): social technologies and emergent forms of curating* paper presented at ISEA 2008 (International Symposium on Electronic Art) July 2008 and published in conference proceedings, and *Software Curating: programming and curating for networks* presented at the Computer Art Congress [CAC 2] at the Tecnol&oacute'gico de Monterrey in Mexico, March 2008 and published in conference proceedings by Europia Productions, Paris.

endnotes

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#### 02. EXPERIMENTS IN (SOCIAL) SOFTWARE CURATING - ENDNOTES

Submitted by Joasia Krysa on Sun, 09/14/2008 - 16:00

(1) For example, the term "tactical curating" is used by Roger McDonald (of Arts Initiative, Tokyo) to describe operating independently making reference to "tactical media" - a contemporary form of activism that is best characterised by the appropriation of mass media and current technology to challenge institutions of power. Further references: (http://en.wikipedia.org/wiki/Tactical\_media);

(http://www.tokyoartbeat.com/tablog/entries.en/2007/08/curating-from-outs...).

(2) Alf Rehn, posting to iDC list, thread title "Kurating Keen", 25 August 2007 (https://lists.thing.net/pipermail/idc/2007-August/author.html), iDC list archive (http://lists.thing.net/pipermail/idc/)

(3) Paul O'Neill, posting to Curatorial Network List, 23 October 2007
 (http://www.curatorial.net/pipermail/curatorial/2007-October/000142.html); further discussion (http://www.curatorial.net/pipermail/curatorial/2007-October/thread.html)

(4) Of particular relevance to this discussion are for instance Goriunova and Shulgin (eds.) (2004), or Fuller (2003).

(5) Adrian Mackenzie (2006) in his book *Cutting Code. Software and Sociality* reiterates the point: "Despite appearing "merely" technical, technical knowledge-practices overlap and enmesh with imaginings of sociality, individual identity, community, collectivity, organisation and enterprise. Technical practices of programming interlace with cultural practices." (2006: 3-4)

(6) The exhibition was accompanied by the Press Release (currently in Tate Archive, VA Pub 179) and an independent publication coinciding with the show - a special issue of Studio International entitled "Cybernetic Serendipity" (1968) edited by the exhibition curator Jasia Reichardt. For further references see MacGregor 2002, Reichardt 1968, Gosling 1968, Brown 1998 (http://www.mediaartnet.org/exhibitions/serendipity).

(7) For further references see (Gere 2005: 156-160), (Burnham 1970) and Eddie
Shanken's "The House That Jack Built: Jack Burnham's Concept of "Software" as a
Metaphor for Art", chapter published by Leonardo Electronic Almanac 6:10 (November, 1998) (http://mitpress.mit.edu/ejournals/LEA/ARTICLES/jack.html), full version also
available online (http://www.artexetra.com/House.html).

(8) Further references for examples listed in this section are: Art and Technology (http://www.fondation-langlois.org/html/e/page.php?NumPage=706; http://www.fondationlanglois.org/html/e/page.php?NumPage=706); Information (http://www.fondationlanglois.org/html/e/page.php?NumPage=706); Information (http://www.fondationlanglois.org/html/e/page.php?NumPage=306; http://www.fondationlanglois.org/html/e/page.php?NumPage=306; http://www.fondationlanglois.org/html/e/page.php?NumPage=237); Center for Advanced Visual Studies (http://cavs.mit.edu/); Tendencije 4 ([Nove] Tendencije computer and visual research, http://www.neuegalerie.at/07/bit/cover.html); CODeDOC (http://artport.whitney.org/exhibitions/past-exhibitions.shtml).

(9) Examples cited are: Desktop Is (http://www.easylife.org/desktop/); C@C -Computer-Aided Curating (http://www.evagrubinger.com; http://www.aec.at/en/archives/festival\_archive/festival\_catalogs/festiva...); FACE (http://fundamentalresearch.org/FACE/face.htm); CodeChat (http://pallit.lhi.is/~palli/codechat/codechat.php).

(10) Examples cited are: Runme (http://www.runme.org); unDEAF (http://undeaf.v2.nl), TAGallery (http://del.icio.us/TAGallery/); Hack-able Curator (http://www.hackablecurator.org.uk/).

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(11) Runme (http://www.runme.org), launched in January 2003, is a collaborative project developed by Amy Alexander, Florian Cramer, Matthew Fuller, Olga Goriunova, Thomax Kaulmann, Alex McLean, Pit Schultz, Alexei Shulgin, and The Yes Men. Further members are Hans Bernhard and Alessandro Ludovico. The Runme.org website has been conceptualised and administrated by Amy Alexander, Olga Goriunova, Alex McLean and Alexei Shulgin; and was developed by Alex McLean.

(12) The issue of how social technologies can be adapted for mainstream art galleries is demonstrated for example in the Saatchi gallery online project "Your gallery". It plays on the earlier popular online social platform "MySpace" (operating under the slogan "a place for friends"), and more recently "YouTube" (operating under the slogan "Broadcast Yourself"). It offers to "showcase your art to thousands of visitors every day", and the added attraction of displaying work on Saatchi's online "gallery" is the possibility of being selected by invited "experts - critics" to the so called "Saatchi Online top 10", or even more prestigious prize of being selected for shows in physical venues. This demonstrates that, despite the claims of many: "communities like this supplement rather than supplant: eBay created a new market and new opportunities for small businesses, but it has not replaced conventional retail", quoted in the iDC List posting from Chris Byrne, 17 August 2007, List Archive (http://mailman.thing.net/pipermail/idc/). References: (http://www.saatchi-gallery.co.uk/yourgallery/), (http://www.myspace.com/), (http://www.youtube.com/).

(13) The description of social technologies and critical concerns that underpin current discussions in this field is derived from the Art & Social Technologies research group (at the University of Plymouth, UK) (http://www.art-social.net).

(14) Other earlier examples of using wikis in curatorial process include Open Congress, 2005 (http://opencongress.omweb.org/wakka/HomePage) and NODE.London 2006 (http://nodel.org). While the curatorial process of Open Congress was facilitated through an online wiki that simultaneously served as a vehicle for documentation and the further distribution of a two-day public event, presented in a mainstream art gallery, NODE.London wiki website was "created to locate media arts in London by inviting practitioners to put themselves on the map and to describe their connections to other individuals, projects and venues". In this way the project "worked as an open organisation, using consensus decision-making and pooling ideas, resources and even people".

(15) For more information see (http://vercodigofonte.blogspot.com/2005/11/onblogging-as-curating.html).

(16) CONT3XT.NET is a Vienna-based organisation founded in 2006 as a collaborative platform for the discussion and presentation of issues related to (New) Media Art. The collective was founded by Sabine Hochrieser, Michael Kargl (a.k.a. carlos katastrofsky) and Franz Thalmair. (http://cont3xt.net/index.php)

(17) The project is described in the following way: "TAGallery by CONT3XT.NET extends the idea of a tagged exhibition and transfers the main tasks of non-commercial exhibition-spaces to the discourse of an electronic data-space. The method of tagging allows the attribution of artworks to different thematic fields. In TAGallery the act of selecting and recombining - besides chronologically ordered show-rooms, exhibitiontitles in a semantically concentrated form and various ways of contextualizing the presented artworks - will be published as well: The continuous progression of curating can be followed by the public, using newsfeeds." The TAGallery is located online (http://del.icio.us/TAGallery). The first TAGallery-exhibition "dead.art(missing!)LINKreSources" deals with the idea of a "link" as metaphor for networking, collaborating, contextualizing as well as with its reversed connotation: missing or broken link. The link that is not working stands for the ephemerality of Web-based art-forms. The requested URL not found on the server emphasises just as much the need for human care and maintenance as technology itself. References: Gallery (http://del.icio.us/TAGallery), Exhibition

(http://del.icio.us/TAGallery/EXHIBITION\_dead.art).

(18) Other examples of the use of blog in relation to (public) curating, as listed in CRUMB List posting from 15 August 2007, include: http://www.curating.info (run by Michelle Kasprzak), http://museumtwo.blogspot.com/ (run by Nina Simon), http://curating-netart.blogspot.com (run by Ursula Endlicher and Ela Kagel), http://leisurearts.blogspot.com/ (run by an anonymous group). More generally in relation to new media art, examples of blogs listed in the same CRUMB posting were: http://www.we-make-money-not-art.com (run by Régine Debatty);

http://blog.furtherfield.org (run by furtherfield/http); http://www.test.org.uk (run by Matt Locke), http://www.eyebeam.org/reblog/ (run by a different person every two weeks), http://blogs.walkerart.org/newmedia/ (run by designers/producers), http://www.coinoperated.com/ (the site of artist Jonah Brucker Cohen). The CRUMB List Archive can be found online (http://crumbweb.org/discussionMenu.php? id=9&showList=1&ts=1199034774).

(19) For more information see (http://del.icio.us/)

(20) Luis Silva further explains the idea of social bookmarking and its relation to curating: "Social bookmarking allows for users to easily store lists of resources (websites, for instance) and have them available to the public, allowing people with the same interests (or not) to share and have easy access to relevant information on a specific subject. But the most important feature of social bookmarking lies in the categorization of these resources by the users themselves. Tagging is the word that comes to mind. Tagging consists basically in the possibility these social bookmarking services have of allowing the users not only to bookmark something, but to informally assign tags (relevant keywords) to it, thus creating meta-data about the tagged resources in a collective way, rather than individually, something that can be seen as a second layer of meaning, but determined by the users rather than the original producer of the content. This is what is called folksonomy, a user-generated taxonomy used to retrieve and categorize web content." References:

(http://del.icio.us/TAGallery/STATEMENTS\_I.tag\_you; http://del.icio.us/TAGallery/EXHIBITION\_I.tag\_you).

(21) Hack-able curator (2007) is a collaborative project by students of masters programme in Digital Art and Technology (m-DAT) at the University of Plymouth (UK): Anita Barwacz, Lindsey Bedford, Andy Bennett, Anaisa Franco, Martha Patricia Nino and Richard Wilkes. It was first shown as part of SLOW exhibition (January - March 2007) at the Plymouth Arts Centre, Plymouth, UK (http://www.hackablecurator.org.uk/).

(22) There is a distinction here to be made between the term "hacking" and what some refer to as "cracking". While hacking (performed by a "hacker") describes a computer expertise and skills used to solve difficult technical problem without causing computer harm, cracking (performed by a "cracker") implies using technical expertise to break into computer systems for malicious purposes causing harm (for instance shutting computer systems) (Barabási 2002: 116).

references

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