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« Digital Cultures: Alternatives »

Diversity as Experience

Access and Forms of Visibility Granted by Artists to Contemporary Data

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Abstract

Internet and its services like the Web have evolved considerably over the last two decades. The nature of the artistic proposals which have gradually invested this network has also changed. Their design has constantly evolved to adapt to structural changes and to retrieve new data flows that have appeared with them. The stories behind the creation of connected artworks are instructive. They provide information about the evolution of digital technologies by reflecting the way they allow us to access and share information online. This paper reviews these developments through the presentation of various artworks that retrieve online data and renew their perception.

Keywords: connected artworks, digital art, exploratory programming, *Net Art*, technical culture

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Introduction

Over the past decades, the evolution of the Internet and its services, such as the Web, has been tremendous. The Web is no longer regarded by its main stakeholders as a new continent to explore. It has become a space mainly dedicated to trade, regulated by both domestic and international laws which set out the type of data each user can access depending on their territory, as well as their conditions of use and reception. However, the forms of experience associated with the Internet keep on evolving as new services are provided, and the multiplication of connected devices disrupts the ways and modalities of private data collection and information retrieval.

The Web is no longer limited to a space to be browsed or a technology one intentionally uses. The connectivity of the devices present in our living places put the Internet into our everyday life in increasingly diverse, if not visible, shapes. Access to the Internet has diversified as along with the nature of the information accessible through this network. The information we access mostly reaches us through computers, the (graphic and programming) interfaces of which act as filters.¹ The use of digital media and devices has also changed through contact with the various populations using them: for instance, the functions of social networks and content-sharing platforms vary depending on the identity of their users and the communities to which they belong.² The fact that people access the same services does not imply that they share the same “digital culture,” or that they are aware of uses outside the circles of their relatives, friends or coworkers. The plurality of uses that can be made of the same service eludes us, for we escape the gaze of people outside our direct vicinity via an interface. Our idea of the number and identity of the individuals that use the same platforms as we do is indeterminate. In the same way, we do not necessarily have in-depth knowledge of the operation of these platforms. Contrary to the 1970s, the use of digital tools no longer requires specific knowledge: one no longer requires that an IT technician converts requests for information into application programs to view and update the data stored in a database. Similarly, one does not need to know how communicating devices work to reap the immediate benefits of their presence in our environment.

On the contrary, many objects and applications seem to be primarily targeted at users with no specific knowledge or skill. They correspond to the technical objects that Gilbert Simondon considers as potential alienation producers, as they are designed for ignorant users: “The technical objects producing alienation the most are also the same that are destined to ignorant users. Such objects gradually deteriorate: brand new for a short while, they

1 Lev Manovich, “New Media from Borges to HTML,” in *The New Media Reader*, Cambridge, Massachusetts, The MIT Press, 2003, p. 13-25.

2 Danah Boyd, “White Flight in Networked Publics: How Race & Class Shaped American Teen Engagement with MySpace & Facebook,” in *Race after the Internet*, New York, Routledge, 2012, p. 203-222.

lose value at the same time that they lose this characteristic, because they can only move away from their conditions of initial perfection.”³ Several types of connected devices and applications fall within this category by preventing users from extending the manufacturer’s action. This is notably true for the devices considered by Don Norman as information appliances, the operation of which is facilitated by the limited number of functionalities, a limitation that also prevents the user from performing other tasks than those for which they have been specifically designed.⁴ Not all interfaces foster the development of a “technical culture.” On the contrary, they sometimes seem to keep us away from any learning process and acquisition of knowledge by preventing us from lingering over the operations they can execute and from looking into the technical devices with which they are associated. However, knowledge (even partial) of the software functions constitutes a real asset, for software is never neutral. It guides its own uses and defines its opening. The functionalities of an application, like the design of an interface, have an impact on the user’s experience of an Internet service or a web platform. Artistic education partakes in the development of a technical culture, as it allows for a different perspective on digital technologies and their place in our daily life. The field of art values artistic proposals that question the forms of access and visibility that IT systems of the Web ascribe to contemporary data. Artistic education fosters the development of a critical mind with regards to digital technologies and the low degree of visibility with which they get into our living spaces. By developing projects that stage the circulation of data collected by private companies on the Internet, artists question the impact of IT systems on our representations of and interactions with the real. Through the use of digital technologies and elaboration of artistic proposals, artistic education enables one to examine the properties of digital media and their propensity to give us access to new representations of reality and experiences of the sensitive world. It allows one to rethink the opening and margin of uncertainty of digital technologies. We will defend this point of view through the study of artistic approaches resorting to contemporary technical breakthroughs in order to put forward new reception modes for the data indexed by the Web’s IT systems.

1. Active images

Today, numerous artists engage in selection or transformation operations pertaining to data that can be accessed via the Internet, which allows for a better understanding of the characteristics of this informational space. For instance, artists such as Oliver Laric and Clement Valla often create works from the patient collection of images online. The postcard series that Clement Valla has been putting together since 2010 is the result of his exploration of the Google Maps service. Entitled *Postcards from Google*

³ Gilbert Simondon, *Du mode d’existence des objets techniques* [1958], Paris, Editions Aubier, 2012, p. 339.

⁴ Donald A. Norman, *The Invisible Computer*, Cambridge, Massachusetts, The MIT Press, 1998.

Earth, this collection of images testifies to the algorithmic nature of the landscapes produced by online mapping systems, by submitting us to visual disruptions. Such artistic approach invites one to pay attention to the seams of the worlds that digital technologies allow to model. It reveals the disruptive force of the algorithms from which these environments result, yet usually without our notice.

However, the works that artists are able to carry out regarding the forms of reception ascribed to the data stored by the IT systems of the Web and their structure is not limited to this kind of exploratory practice. The artists who use programming as an artistic medium constantly propose new perspectives on these data streams through exploratory algorithms that automate certain tasks to cover a wider territory. Programming is an activity that enables one to use the properties of digital media, namely modularity, variability and automation. It is also an activity that allows one to ascribe objects with behaviors. Programming provides the opportunity to create open machines and consider software as media (capable of ensuring the circulation and transformation of data) that constantly evolve according to their users' desires and actions.

Antoine Schmitt's work is an example of how programming can be used to define behaviors and ascribe them to objects. Created in 2006, the "living graphs" series entitled *Still Living* ascribes a "being mode" to curves, bars and histograms that are supposed to represent a phenomenon. Talking about this work, the artist mentions "the fusion of map and territory," the "friction between the object and its representation," a "reversal of the graphic representation of the living."⁵ The graphs to which Antoine Schmitt ascribes a behavior do not aim at representing a phenomenon, but rather at embodying it in the form of images presented as active forces. They provide a critical reading of the graphs that are widely used, not to describe reality, but rather to impose behaviors and set standards. The interactive images designed by artists to produce a representation of social and cultural phenomena from data collected on the Internet do not operate as mere sounding boards. Like Antoine Schmitt's graphs, they correspond to the real interfaces and agents of the social discourse on which artistic education raise our awareness. Created by Golan Levin, Kamal Nigam and Jonathan Feinberg in 2006, *The Dumpster* is one example of interactive images modifying the perception of a socio-cultural phenomenon. *The Dumpster* is an application that allows its user to browse a digital archive consisting of 20 000 break-up messages uploaded by American teenagers. The application gives access to an interactive display associating messages originally scattered over thousands of Web pages, and gives the portrayal of a crowd of individuals using the same informational spaces and going through similar sentimental hardships, yet not knowing each other. Using the data streams found across the Internet to depict the feelings through which we go, *The Dumpster* illustrates the kind of visibility that the arts can speculatively give to phenomenon and activities that are not represented and yet stir the Internet.

⁵ Samuel Bianchini and Antoine Schmitt, "Le travail du temps : programmer un mode d'être," *Art++*, HXX, 2011, p. 75.

The emotional representation developed by *The Dumpster* particularly resonates with the works of artists such as Jonathan Harris and Sep Kamvar, whose project entitled *We Feel Fine* (2006) invites one to interact with “living paintings” representing, in the shape of particle systems, the feelings shared on the social Web. It also echoes the works of Martin Wattenberg and Fernanda Viégas, whose application *History Flow* (2003) aims at giving a graphical account of the elaboration of a Wikipedia entry and its evolution over time, by bringing out events such as arguments between authors and acts of vandalism. In these projects, one shifts from the production of knowledge of images to the composition of images that upset knowledge by demanding that we take a new perspective on the forms of visibility ascribed to the data archived by the IT systems on the Web. Such artistic proposals remind us that a same piece of information can be found in many shapes that all have an impact on the reader. They remind us that any representation of a socio-cultural phenomenon is simplistic, incomplete and likely to be improved by other representations.

2. Exploratory practices

The behaviors that the artists ascribe their images with are based on their understanding of digital technologies. As practitioners, these artists show an interest not only in the nature and amount of data recently made available on the Internet, but also in the forms in which they are archived and accessed. Their use requires experience and knowledge of IT systems. It allows these artists to design devices that operate without contradicting the understanding of their works. This particular idea is supported by artist and university lecturer and researcher Victoria Vesna in her introduction to the book *Database Aesthetics*, dealing with the use of databases in the field of arts:

As a professor in the field of media arts, I have realized that too often novice media artists and designers develop work first, and then, as an afterthought, turn to thinking about how to store and manage data. This method of working results in many awkward pieces that use preconceived notions of organization that may actually contradict the meaning of the piece itself. The core message of this volume is that one first has to research, collect, and survey the data needed for the envisioned work and then decide how the database design and engine will appropriately reflect the concept.⁶

For Victoria Vesna, artists who resort to digital technologies must consider the invisible structure of databases and the browsing options they allow, as structural elements the potential of which must be exploited. Artists cannot disregard the materiality and functionalities of digital technologies. On the contrary, they must put them into practice them, like a musician practices and tunes their instrument, in order to face the massification of data by offering their own interfaces and multimedia streams layouts. Through the study of these interfaces and data streams layouts, artistic education allows one to perceive digital technologies as

⁶ Victoria Vesna, “Introduction,” in *Database Aesthetics: Art in the Age of Information Overflow*, Minneapolis, University of Minnesota Press, 2007, p. IX-X.

open machines, the interfaces of which aim to define, and better yet reprogram, the uses.

The history of works derived from digital technologies allows one to trace the evolution of the forms of reception ascribed to the data archived online. It also allows for the identification of the models successively used by artists to structure data systems. Since the beginning of the 1990s, the artistic devices developed with the help of database management systems to give access to online digital archives show an increasingly pronounced lack of interest in models based on the printed book culture, along with an increased use of the functionalities inherent to databases, which allows for the identification, within shapes, of the technical breakthroughs pertaining to an era.

Presented for the first time in 1994, Antoni Muntadas's installation *The File Room* is one of the first artworks to use a database to provide an online access to a digital archive, at a time when Internet was still regarded as a borderless territory belonging to no nation.⁷ The database, listing acts of cultural censorship, was designed at once as an open archive using the properties of digital media to facilitate its accessibility and expansion. However, the conditions of access to the archived information also evidence a strong attachment to paper books. For instance, the application does not feature a navigation bar which would allow one to browse the archive from its main sections. It opens up on a table of contents. Unlike the interface of a hypertext, the structure and functionalities of this application do not allow one to browse the archive through association of ideas.⁸ It prompts users to consult information nodes in a sequential manner. The archive does not make extensive use of the functionalities of the database on which it is based, which would yet allow for the potential multiplication of the ways the archived data is displayed, as artists such as Golan Levin, Jonathan Harris or George Legrady would show in the 2000s. *The File Room* proposes that one browses its archive by choosing from four categories (dates, locations, type of censored medium and the grounds for censorship) giving access to lists of reports that cannot be reorganized. In other words, *The File Room* lacks ramifications. The interface does not encourage a nonlinear reading of the archive, since each category transfers its own linearity onto the consultation of every act of censorship. Moreover, its users may partake in the development of the archive only if they publish a new report. The information that is already archived can neither be completed, nor corrected.

The structure of the application does not in any way affect the disruptive nature of Antoni Muntadas's work, which heralds the emergence of platforms such as WikiLeaks (launched in December 2006). The limits of this application created in the early 1990s result from the changes in the reception and reading of information viewing that the development of collaborative databases and their presence online would induce. The

⁷ John Perry Barlow, *A Declaration of the Independence of Cyberspace*, 1996. [Online] <http://projects.eff.org/~barlow/Declaration-Final.html> [accessed 22 May 2016].

⁸ Vannevar Bush, "As We May Think," *The Atlantic Monthly*, vol. 176, no. 1, 1945, p. 101-108.

analysis of artworks such as *The File Room*, *We Feel Fine* or *The Dumpster* sheds light on these changes and shows how artists have successively appropriated the functionalities of the database management systems to experience the online visibility ascribed to this demographical and socio-cultural data. The variety of uses that artists now make of databases shows common knowledge of their structure and functionalities.

However, right use of these databases never comes naturally, for it requires that artists look into the history and nature of the data they collect and associate. The automation of data collection and organization does not allow one to mechanically derive meaning from the multimedia flows running across the Web. On the contrary, it results in new organization issues, as evidenced by project *A Quiet Disposition*⁹ launched in 2013 by James Bridle, with a stated purpose to provide access, in the form of a database, to all information available online about the civil or military use of drones. However, James Bridle's application hardly displays any interesting piece of information. The abundance and diversity of archived documents do not facilitate browsing. Automatically generated from various documents, the interface and hypertext links do not so much guide the visitors venturing into this informational maze as they wilder them. The full automation of the archiving process makes the generated database a very abstruse one. James Bridle's work reminds us that making sense of the data found on the Internet is no task to be left to machines alone. It must be subjected to particular human scrutiny. The study of the care given by artists to the data they collect online and gather by their own means allows one to adopt a reflexive approach to the forms of visibility ascribed by IT systems to the data going through their servers. In comparison, the analysis of the artistic apparatuses presenting themselves as web applications leads us to focus on the behaviors induced by the interfaces of business platforms and the representations of social and cultural phenomena that they convey. It pushes us to look into the calculations made by these platforms to manage the information they store. It contributes to the development of a technical culture that invites us to examine their mechanisms and identify the visions of the world which they resort to so as to attract new users and bid them to join "communities."

The way *We Feel Fine* and *The Dumpster* depicted Internet users in the mid-2000s deconstructs the image of communities that social networks and content-sharing platforms try to develop. As they try to illustrate the emotions permeating the Web, their respective authors manage to come up with interactive images of the individuals dwelling on the social Web. However, the images do not portray these people as individuals belonging to the same community of users. They show them as members of the same crowd of anonymous people: each individual is represented by a circular shape that associates them with, yet keeps them away from, others. *The Dumpster* does not give any opportunity to interact with the image of a community: the bubble-shaped representation of each message does not allow one to consider its author as part of the same whole. On the screen,

9 [Online] <http://aquietdisposition.com> [accessed 22 May 2016].

each emotion remains isolated from the others. The bubbles do not merge. They only share the same display space. In this way, *The Dumpster* manages to convey a collective image of solitude, a feeling that seems to be shared by many of the teenage authors of the archived messages, teenagers who fail to find any kind of representation on social networks.

The creation of this image partly results from Golan Levin's use of his database structure to give access to information regarding both the whole archive and only part of its elements on the same screen. The interface combines different reading instruments which allow for the simultaneous comprehension of both the micro and macroscopic levels of the archive. The database is used to give a representation of the archive highlighting both the quantity and individual qualities of its elements. Messages are not reduced to simple geometric shapes. It is possible to select the bubbles gathered by interface of the *Dumpster* to access each of these individually. Both *The Dumpster* and *We Feel Fine* offer a "media visualization"¹⁰ providing access to raw data from an interactive image.

3. Participative architectures

Databases provide an opportunity to create online works resulting from the joint efforts of a group of individuals, and the development of which can run over a period of time. Ultimately, hypermedia works emerge, with no beginning or end, characterized by their ability to evolve. Some artistic apparatuses created with the help of databases attempt to the concept of "social sculpture" with a digital form. The "social sculpture" concept was developed in the 1970s by Joseph Beuys in order to associate objects designed by and for a community with the field of art. It allowed the artist to clarify the nature of the link that he would draw between art and life throughout his life, notably in the form of "environmental performances" such as *7 000 oaks*.¹¹ A social sculpture requires the expressive abilities of the people it gathers. It invites them to act for the common good, and recreates individuation by allowing the participants to individually question their lifestyle and change their behaviors towards the urban space or cultural phenomena such as censorship, for instance. Antoni Muntadas openly claims the use of the social sculpture concept to account for the participative dimension of the archive accessible through *The File Room*.¹² However, it should be noted that, in the long term, artistic apparatuses have a hard time fitting into a contributive economy fostering the development of new sharing spaces. The platforms created by the artists are not operational forever. Their vitality is dependent on technical and economic constraints. Their longevity largely depends on the efforts of their authors to maintain them in working conditions and ensure their performativity, by regularly

10 Lev Manovich, "What is Visualisation?," *Visual Studies*, vol. 26, 2011, p. 36-49.

11 Beginning in 1982 as part of the Documenta 7, the *7000 oaks* project offered to act on the urban territory by inviting inhabitants to plant a tree, together with a basalt stele, in the streets of Cassel (Germany).

12 Antoni Muntadas, *L'Art comme dispositif de connaissances*, 2007. [Online] <http://www.fondation-entreprise-ricard.com/Conferences/view/189-antoni-muntadas-l-art-comme-dispositif-de-connaissances> [accessed 22 May 2016].

adapting their structure to the upgradeable ecosystem that is the Internet. Many *Net Art* works created throughout the 1990s and 2000s remain online only as traces because of the commitment required by such maintenance. The field of art has trouble coming up with alternative solutions to the models proposed by the Internet giants. The strength of artistic proposals lies in their ability to temporarily break the boundaries of multimedia data by opening them up to new browsing modes. The social nature of the constructions available online is subjected to ravages of time and constant evolution of digital technologies. However, as shown by Jonathan Harris's and Golan Levin's work, artists do not necessarily intend to create new content-sharing platforms. Their works may also aim to shed light on the properties and specificities of informational spaces which we already contributing to build. By taking an interest in data published online by communities of users via blog platforms and social networks, the artists contribute to revealing the structures owned by private companies. In this sense, the artist's role no longer consists in offering new participative architectures, but rather in taking a stand on a certain digital structure, by revealing the forms of visibility that are ascribed to contemporary data by default. To do so, one can follow the example of R. Luke DuBois and take a closer look at the words used by dating site users to introduce themselves.

In 2010 and 2011, artist R. Luke DuBois created a series of maps of the United States of America based on information collected with digital tools on several dating sites. Entitled *A More Perfect Union*, this work plays with the codes of administrative maps to draw a distinction, at the scale of a nation, between the expressions of different emotions such as shyness, joy, loneliness or enthusiasm.¹³ Like many data visualizations created in the field of the art, these maps do not aim at providing objective information to be scientifically processed.¹⁴ They take part in a speculative mediation effort, which mainly aims to offer a new experience the ways one introduces oneself online and tries to establish genuine contact. By replacing the names of the cities in States such as California by the words their inhabitants favour when introducing themselves on dating sites, the maps created by R. Luke DuBois showcase a glossary of dating and seduction that expresses a certain way to ensure online visibility.¹⁵ These maps do not aim for any lexical comprehensiveness or richness. On the contrary, the poorness of the spatialized lexicon emphasizes the frailty of the guise we choose to introduce ourselves to other people on social network interfaces. In order to create these maps, R. Luke DuBois subscribed to twenty-one dating sites under as many identities. In this way, the artist has managed to download fifteen million profiles and analyze their content.¹⁶ This infiltration strategy reminds us of the tactics used in the beginning of the 2000s by artists such

13 [Online] <http://www.bitforms.com/dubois-perfect/a-more-perfect-union> [accessed 22 May 2016].

14 Mitchell Whitelaw, "Art Against Information: Case Studies in Data Practice," *FCJ*, no. 11, 2008.

15 [Online] <http://www.bitforms.com/dubois-perfect/a-more-perfect-union-california> [accessed 22 May 2016].

16 H. Paul Moon, *R. Luke DuBois: Running Out of Time*, 2010.

as Grégory Chatonsky (*La Révolution a eu lieu à New York*, 2002) and Christophe Bruno (*The Google AdWords Happening*, 2002) to work with the social Web data streams.¹⁷ However, unlike *Net Art* works, R. Luke DuBois's work does not favor the Internet as a space for display. *A More Perfect Union* is exhibited in galleries. The artist chose a type of display that takes us away from screens by inviting us to browse through a series of printed and framed digital maps.

4. Processes and performativity

The artists who resort to the data indexed by IT systems on the Web pay tremendous attention to the process. In the case of *Net Art* works, some researchers will go as far as to focus more on the technical device than on the exhibited work: “The in-depth analysis of *Net Art* clearly shows this shift through which the piece is less inscribed in what it shows than the device that allows it to be.”¹⁸ Artists such as David Darts and Julian Oliver pay great attention to the objects and communication protocols they use to create temporary file-sharing networks (*PirateBox*, 2012), to intercept data (*The Transparency Grenade*, 2012) or scramble communications (*No Network*, 2013). Part of their activity consists in documenting the operation of the objects they design in order to allow others to reproduce or even improve them.¹⁹ The artistic activity results in externalized knowledge allowing the artist to teach what they have learned through their exploratory practice of digital technologies. However, the visible part of the work should not conflict with the IT structures that allow for its operation. Despite the importance of the device, which breathes life into the artistic proposal, it seems necessary not to diminish the reach of what is displayed, so as to better understand how the visible part of a work can show the singularity of an artistic proposal and of the data streams structure it provides. The interface of a work is in contact with the part of the latter ensuring the reception and circulation of data. In this respect, it may reflect the operation of the system on which it was developed and renew its reading. Although David Darts and Julian Oliver grant a great importance to the operation of their communicating objects, they do not disregard their appearance and ascribe their shapes and dimensions with the characteristics of their projects. The appearance of the *PirateBox* appearance and the imagery with which it is associated are a direct reference to the free software culture and realm of piracy, while Julian Oliver's objects play with the aesthetics of surveillance associated with digital technologies.

The strength of the bond between the appearance of a work and the device on which it relies reaches its full potential in algorithmic art, since each image is a graphical representation of actions defined by programming languages and executed as the viewer receives them. The trajectory of

¹⁷ Florent Di Bartolo, “Déjouer les interfaces,” *Interfaces numériques*, February 2015, vol. 4, no. 1, p. 57-70.

¹⁸ Jean-Paul Fourmentraux, *L'Œuvre virale : Net art et culture Hacker*, Brussels, La Lettre volée, 2013, p. 30.

¹⁹ [Online] <http://daviddarts.com/piratebox-diy-openwrt> and <http://transparencygrenade.com> [accessed 22 May 2016].

Antoine Schmitt's *Pixel Blanc* (1996) is the direct and minimalist expression of an algorithm written by the artist. Its movements raise the question of the nature of the forces behind it. Today, the works of artists such as James Bridle and Darius Kazemirenew provide a fresh perspective on this issue, by applying it to the calculations made by the IT systems to control the access to their databases. These artists define new data layouts by designing robots that are able to associate the data they come across when browsing Web services according to pre-established rules. Darius Kazemi's *bots* are specifically designed to browse the platforms owned by companies such as Amazon and Twitter. They adapt to their architecture and mimic the behavior of their users to better hijack them. For instance, the autonomous agent called *Random Shopper* (2012) was created to buy cultural products costing under USD 50 on Amazon every month.²⁰ Darius Kazemi's *bot* points out the mechanical nature of the movements and decisions we make on the Web, by attempting to escape the recommendations of the business platform.

Conclusion

The study of connected works reminds us that the forms of the access to contemporary data do not necessarily have to be those which the giants of the Internet provide us with by default. They can evolve under the influence of their users. The artistic proposals do not so much represent genuine alternatives to these models as they incite one to support the variety of ways in which one receives the data streams permeating the Web. Artists invite us to experience the potentially disruptive nature of digital technologies. To do so, they design artistic devices that upset our comprehension of the Internet and idea of the interactions between the human beings who make this network live.

The study of artistic practices invites us to experience diversity. It leads to new perspectives by questioning the *modus operandi* of digital devices. The way the artists mentioned in this article use programming allows us to think of a culture focusing on the meaning of technical objects and refusing to consider the relationships between humans and their artificial space as fixed. The study of their artistic approach participates in the development of a genuine technical culture which embraces the richness of man-machine interactions, and that is able, through the attention it grants to digital technologies, to understand their issues and foster the emergence of singular practices.

Connected works fall within an ecosystem, the instrumental uses and mercantile logic of which they try to divert. For the most part, the artistic proposals involving the data indexed by IT systems do not break away from their platforms. However, they put their operation, standardized forms of experience and economic logics to the test. At a time when the presence and the connectivity of communicating objects increases in our environment, many artists choose to question the safety and value of the private data that

20 [Online] <http://randomshopper.tumblr.com/post/35454415921/randomized-consumerism> [accessed 22 May 2016].

we share online rather than reject this new step of ubiquitous computing. Let us hope that the forms taken by their artistic proposals will increase the singular experiences of the data collected by these devices, and offer to open them up to new exploratory practices of the Internet network.

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