ACTING THROUGH TECHNOLOGY:THE PROLIFERATION OF OPEN SOURCE PRACTICES AND ITS CONSEQUENCES

Panel statement

The internet has enabled new forms of sharing and collaboration which arguably have been pioneered by early open source communities (Coleman 2013). The availability and modifiability of the underlying technologies and infrastructures combined with the technological affordances of the internet has allowed open source advocates to use technology as a form of expression: they not only act *with* available technology, but *through* it by creating technical infrastructures that express ideas and concepts about "how economy and society should be ordered collectively" (Kelty, 2008, p. 28). Kelty (2008) described open source as an experimental system made up of five key practices: sharing source code, defining openness, writing copyright licenses, coordinating collaborations, and forming a movement. These practices can be adopted and appropriated by actors in almost every area of social life, from encyclopedic knowledge (*Wikipedia*) to activism (Beyer, 2014) or creativity online (*Creative Commons*). While there have been critical voices for some time, these practices have been regularly seen by the broader public, as well as by academia, as promoting democratic values like participation and knowledge empowerment in the digital mediascape. Much less attention has been paid to the broader consequences of this "reorientation of knowledge and power" (Kelty, 2008, p. 7), i.e. to the actual social structures expressed and promoted through such practices. Tkacz (2012) has shown that promoting openness and transparency introduces new forms of closure which are often overlooked. Drawing from Stuart Hall (1997, p. 230), we suggest that what is at stake in these developments is not a dual choice between 'open' and 'closed' forms of social organization, but a more complex transition between different modes of regulation and valuations of technologies which need to be examined carefully.

This panel brings together early-career scholars that aim to shed light on how different actors in different domains of social life are acting through technology and what values and forms of social organization they promote through such practices. The first paper (A) will explore the *internal* social structures among producers who are radically committed to openness through sharing technology and content online. It foregrounds that in these practices, openness and sharing are not only about creating open knowledge, public digital culture and technologies, but also trigger practices of self-control, discipline, and contestation over what is to be made public and how. The author argues that the ways in which these are negotiated have implications for the broader domain of cultural production online. The next two papers each look at the social structures *promoted* through open source practices by exploring how actors

committed to them are trying to *affect institutional politics.* The second paper (B) explores hacking as a politically motivated practice by showing how one of the world's largest hacker organizations – the *Chaos Computer Club* (CCC) – thematizes, problematizes and ultimately politicizes technology. It demonstrates that by acting on the structural features of contemporary political constellations, the CCC is able to bring its political endeavor of politicizing technology to life. The third paper (C) explores the relatively new phenomenon of civic tech, which is about developing tools to solve civic problems by improving government services or by empowering citizens. It shows that civic tech applications do not merely describe, but aim to shape the relationship between citizens in their governments in particular ways through structures encoded in the data they utilize and collect. The final paper (D) introduces another perspective by exploring how established institutions are *adapting* practices and values from open source cultures, thereby *expanding their existing structures and practices.* It analyzes an investigative journalism story run by *The Guardian* that combined open data, crowdsourcing and game mechanics with the purpose of engaging readers. The case shows how news organizations are acting through technology to shift media agency by inviting the readers to take an active role in the investigation, and how such practices can reconfigure civic engagement.

As acting through technology becomes more widespread, this panel emphasizes the importance of empirical and cross-disciplinary research by showing how similar practices and values from open source cultures can be used to support different modes of regulations in different areas of social life.

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(A) Sharing technology and media as digital commons: sensibilities and tensions from making invisible things visible

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Sharing and openness are two fundamental values that underpin the internet, and are constantly under a dynamic contestation. Since the days of the early internet, different groups have worked for making public different aspects of computer culture. Hackers and free software developers, for example, have ever since been committed to making software code and internet infrastructures public (Coleman, 2013). Proponents of free culture have emphasized the need and importance of making public digital creative work, and circulate it online as commons. Many of the online platforms today also encourage sharing as a way to make profits, and as a way to foster network sociality and online self-expression. As such, internet cultures are formed largely around different politics of visibility.

While much attention has been paid on the broader implications of different configurations of visibility online, there are less empirical studies about the ways in which visibility configures the actions of those practicing it. How is it experienced internally by those who share their code or creativity online, and what remains out of sight and is never being shared?

This paper explores these questions through a focus on the social structures expressed and created within media production practices that are radically committed to openness through sharing technology and media content as commons online. It also addresses the ambiguities and affective sensibilities that emerge internally within these practices. While not denying the positive role that such practices can have for creating a pluralist and more democratic mediascape, the paper aims to add a critical perspective on sharing and illuminate the complexities and inner tensions that emerge from a radical commitment to visibility and publicness online.

Openness and transparency are frequently promoted in practices of good governance, and have historically been part of a broader ideological project for public access to knowledge that would allow individuals to gain more autonomy, and build a fairer society (Birchall, 2011; Hood, 2006). Yet, practices of visibility simultaneously produce and reconfigure power relations in manifold and subtle ways (Flyverbom, Christensen, & Hansen, 2015). They play a subtle control function, one that creates practices of self-regularizing behavior, and monitoring. Transparency can therefore activate different configurations of control, power, empowerment and disempowerment.

Using these ambiguities as a theoretical vantage point, the paper discusses two cases of open film production which were studied through multi-sited ethnography and qualitative interviews in the period between 2013-2015. The cases are presented and compared with each other in order to delineate similarities and differences of the subtle effects that visibility has inwardly.

The first case is the production of the 3D animation film Cosmos Laundromat (2015, Netherlands), which extensively used YouTube as a channel to disclose the film making process to the public. Each Friday during the production year that lasted between 2014 and 2015, the team of animators, script writers, programmers, directors and producers, disclosed their work on the film in a public livecast streamed and recorded on YouTube. In these public reports, oriented towards an internet audience, each of the team members would communicate what they have been working on during the last week, show concept art being drawn, report changes in the script, and discuss pieces of software code in progress that would make the artistic visions of the film possible. The video recordings, and the media artifacts presented in these reports, such as software, computer graphics, and texts were subsequently swiftly organized and put online as commons in a cloud service that grew into a substantial digital archive of the production process.

The second case is the 2D project Morevna (2016, Russia). Similarly disclosing the media, technology, process and organization of work, the project has been using the blog format in order to post production progress summaries on a weekly basis. Each post would similarly feature also graphics, technology and sometimes music in progress, shared online by the producer.

Both cases revealed that, at an individual level, sharing pieces of software or works of art in progress would usually create strong senses of emancipation among the team members. Sharing allowed artists and programmers to expose a lot of work which in more conventional production frameworks would have remained hidden (Velkova, 2015). Thus, sharing was perceived as helpful in order to establish reputations online, and as such, foster systems of meritocracy.

Yet, at the same time, sharing and reporting work-in-progress created continuous pressures and obligations to actually have something to share, to present, to report and to admit progress on a weekly basis. This pressure established a rhythm, structure and pace for the film productions, which from the outside seemed rather spontaneous and unstructured. It also created peer-pressure among the teams, to produce and share as much as everyone else, or else have an explanation for why little was shared. As a consequence, sharing resulted in individual strategies to internalize control and develop a self-regularizing behavior. For example, one artist admitted: ' ' Putting work-in-progress online is not really an issue for me. My artworks are often little stand-alone finished piece in themselves; I never posted a half painted picture' ' . Such strategies implied redefining the meaning of what counts as a work-in-progress to be shared, and of working more intensively in order to match the productivity of other, more successful in sharing peers.

The study shows that the inward control mechanisms triggered by sharing ultimately had positive benefits, resulting in raising the quality of the films being made. Surprisingly though, most of the team members of both films were rather unaware of the dependency created between sharing-control-productivity- and quality. There was also

very little discussion internally on what has remained out of the sight of the internet public. Continuous internal conflicts among the team members, and the ways in which they have been resolved; changes in the teams; as well as the notable hardware infrastructures that had to be accumulated in order to enable the creation of these animation films remained continuously excluded from disclosure. Some of these aspects were obscured deliberately, and justified as necessary to allow the projects to progress, yet others remained hidden unintentionally. Yet, revealing them could help to make open media at scale, as it would have helped the broader internet community interested in making commons to gain knowledge about how to manage difficulties in larger projects based on sharing and commons; as well as on the necessary initial assets. Without sharing these difficulties, sharing might become an instrument in a struggle for power and recognition among an elitist community.

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(B) How the Chaos Computer Club acts on surveillance

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The focus of a large number of recent studies has been on the role media technologies and infrastructures (MTI) play for political actors of varying kinds in coordinating collective action, mobilizing large-scale protest and distributing their claims amongst global audiences and publics (see, for example, Earl & Kimport 2011; Cammaerts et al. 2013; Kavada 2015). For all their useful qualities such frameworks have for analyzing the role media play for bringing actors' political projects into being, their focus remains on what actors do *with media*. To put it broadly, what is at the center of most studies on the interconnection between media and politics is either the *use* or the *impact* of specific tools, platforms or devices.

It seems no longer overstated to say that almost any form of political engagement today relates in one way or another to MTI. Along with this development, media technologies and infrastructures are increasingly sites of an active political struggle in their own right. In particular over the past years, one could notice a pluralization and diffusion of actors who go beyond the "interface level" by engaging with media technologies and infrastructures in more profound ways (see Postill 2014). A telling example that I want to discuss in this paper is the global spread of hacker cultures. As Coleman has argued: ' The politically engaged geek family continues to grow – in size and political significance' (Coleman 2014, 382). Hackers tinker with, deconstruct and rearrange existing technology; they support, build and maintain new infrastructures; and, by doing so, they challenge common conceptions of what is understood as political engagement.

Examples of hacker initiatives range from infamous collectives like *Anonymous* to less-known grassroots efforts like *Freifunk* and *Riseup*. These examples do, of course, vary strongly from each other concerning their political ambitions, ideology and histories. What connects these initiatives is that each of them brings together people who consider MTI as 'a site of intervention in itself' (Lievrouw 2011, 102). Members of these initiatives do a lot of stuff *with media*, but their primary objective is to *act on media*. Hackers, in other words, often introduce an element of politics into the apparently innocuous deployment, application and use of MTI. At the same time, empirical findings from research on hacking as a politically motivated practice are still scarce and little is known about the ways hackers bring their political projects into being. Hence, there is need for more in-depth research on actors who 'throw themselves actively into a process of political becoming' (Coleman 2014: 396) by acting on MTI.

To deepen our understandings on the entanglements of hacker cultures and politics, this paper presents findings from qualitative research (face-to-face interviews, participant observations and a media analysis) on Europe's oldest and one of the world's largest hacker organizations – the *Chaos Computer Club* (CCC). Considering the case of the CCC one can note that their practices go far beyond the use of individual tools or particular platforms. Club members invest high hopes in the

emancipatory force of technology (Söderberg 2013), but at the same time they problematize the risks that the technological pervasion of almost any domain in society involves. In strong contrast to the majority of users who interact with technology predominantly via predefined pathways, Club members are actively involved in shaping the features and values of the technologies they use. The CCC's prime point of political engagement is to *act on* MTI by thematizing, problematizing and politicizing "technological" developments. Acting on MTI manifests itself not only in form of direct engagement with technical devices and systems, but also occurs through interacting with different actors, through articulating viewpoints, through sharing knowledge and experiences in different circumstances. To concretize this approach this paper will discuss the Club's engagement related to governmental surveillance strategies and practices in more detail.

Carving out (formerly unrecognized) political qualities of particular technologies relies not solely on hacking – understood as critical, creative, reflective, and subversive use of technology that allows creating new meanings. More concretely, the CCC combines a variety of practices related to and oriented towards MTI. On the one hand, the Club is " deconstructing" existing technology (e.g. reverse engineering governmental surveillance software like the Federal Trojan in Germany) as well as building, maintaining and supporting privacy enhancing technology and alternative communication infrastructures (e.g. Tor servers). On the other hand, Club members articulate their expertise related to contemporary MTI to a wide range of audiences, publics and actors in form of consulting (e.g. policy advice), by writing expert reports (e.g. for the German constitutional court) and through self-mediation as well as interacting with mainstream media outlets. Based on these practices the CCC creates awareness, reveals alternative courses of action and, ultimately, *acts on* contemporary surveillance assemblages.

By doing so, members of the CCC are actors who, as Purcell puts it in the context of the urban public realm, 'continually refuse heteronomy and passivity' and 'continually cease being the political spectator and continually become the political actor' (Purcell 2013, 314). Taken together, this paper conceptualizes the Club as a hacker organization that brings its political endeavor of politicizing technology to life through *acting on MTI*. From a more analytical perspective, including the dimension of "acting on " opens up new perspectives on social transformations in general and political engagement in particular as it allows us to conceptualize media technologies and infrastructures not just as a set of tools for doing politics but as a fundamental part of what politics is about nowadays. As we experience the omnipresence and banalization of computing, it is valuable to note that 'politics are easily buried in technical encodings' (Bowker et al. 2010, 98). Contemporary developments are an opportunity for scholars to bring to the foreground the entanglement of "traditional" forms of political engagement and the different facets of "emerging" forms of doing politics. Looking beyond what actors *do with media* and including how and why they *act on media* scrutinizes the role of actors' practices in contemporary media environments as it accentuates MTI as manufacturable and shapeable. Acting "on" denotes the efforts of a wide range of actors belonging to

different fields to take an active part in the molding of the media technologies and infrastructures that have become part of the fabric of everyday life.

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(C) Civic tech: Restructuring publics through data

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'Civic tech' describes applications that aim to solve civic problems by improving government services or by empowering citizens. Examples are parliamentary monitoring websites, tools that help citizens to report issues to local governments, or that show them how and where to engage in local building projects. The origins of civic tech can be found in the early 2000s, when small volunteer groups of technologist in the US and the UK developed experimental software in their spare time. Early examples are the British *FaxYourMP* (2003), which helped citizens to find and contact their representatives in UK parliaments (Townend 2008), or *GovTrack.us* (2004), which made information provided by the US Congress more accessible (Yu and Robinson 2012, 192). From these early volunteer experiments, the civic tech sector has grown substantially in recent years as it has been embraced by governments and foundations in the US and Europe (Baraniuk 2013). The 'US National Day of Civic Hacking', for example, is directly supported by the US government and attracts thousands of participants each year.[1] The phenomenon also became increasingly international as foundations like the *Open Society Foundations*, *Google.org*, or the *World Bank* are supporting the creation of civic tech organizations in Africa, Latin America, or Asia.

This growing prominence raises questions about the larger cultural influence of civic tech. However, most of the sparse research literature on the subject has been conducted by civic tech organizations and their funders, who are primarily concerned with the 'direct' impact or usage of individual civic tech applications (cf. Escher 2011). While this shows that these applications do have some effect, we also need to ask broader questions: How can civic tech affect the distribution of knowledge and power in society? Would this change be unambiguously positive? To be able to tackle these questions, we need a better understanding of what civic tech applications are *doing* and what *ideas* and *concepts* are driving their creation. This paper addresses these questions and presents findings from a qualitative case study (interviews and content analysis) about the practices and values of civic tech at *mySociety*, a not-for-profit organization from the UK.[2] Founded 2003, *mySociety* is one of the oldest and most influential civic tech organizations that pioneered many civic tech applications which are now considered standard, with customized versions of its tools being used in 44 different countries (mySociety 2015). Some of *mySociety*'s more influential projects include *FixMyStreet.com*, which makes reporting issues to local governments easier; *WhatDoTheyKnow.com*, which helps citizens to submit freedom of information requests to public institutions; and *TheyWorkForYou.com*, a parliamentary monitoring website that works by scraping information provided by the British parliaments online in order to serve it in a more accessible way.

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[1]   http://hackforchange.org/.
[2]   https://www.mysociety.org/.

The basic idea behind applications like *FixMyStreet.com* or *TheyWorkForYou.com* is to empower citizens by making it easier for them exert their rights and to use public services. People are empowered, so the idea, by enabling them to make use of preexisting rights and services more easily. Accordingly, most *mySociety* projects can be interpreted as attempts to 'translate' the bureaucratic and legal procedures followed by governments into user-friendly interfaces and accessible language for citizens. *FixMyStreet.com*, for example, was designed to solve two problems: first, citizens often do not know who is responsible for fixing an issue and second, the reporting itself was deemed difficult because the websites provided by local councils were not user-friendly. To turn reporting issues to local authorities from something that presumably requires time and effort into something people would be able to do along the way, *mySociety* uses maps and data about administrative boundaries to identify which council is responsible for an area. As a result, users of *FixMyStreet.com* essentially just have to click on a map to locate the issue, give a short description and send the report, which will then be forwarded to the responsible council.

This example illustrates that civic tech at *mySociety* is primarily *about resolving problems of scale through structured data.* The 'scale' civic tech aims to reduce is the amount of time and effort people have to invest in doing various things in civic life to make engagement "simple and unremarkable" (mySociety homepage). Practices around structured data are essential for reducing scale in this sense because it depends on the ability to filter, combine and create information about governments. Structured data, in other words, is a key mediator in civic tech and practices around structured data of central importance. Not only does civic tech depend on the affordances of structured data, i.e. on the ability to reorganize information through granular filtering, but on structur*ing* data, on developing a structure to organize information and on putting data into that structure. This is not a neutral or objective process, but an editorial one that requires careful negotiation between the structure of the data and the real-world processes this structure is supposed to represent. James Scott (1998) has demonstrated that techniques to categorize and measure social realities do not merely describe, but shape society. In this sense, the data structures created and utilized by civic tech applications are not just technical or static, but social and performative as they attempt to change the relationship between citizens and their governments. I will show how mySociety rationalizes and utilizes structured data and offer some reflections on the implications for civic engagement.

This paper provides a useful starting point to further explore and compare civic tech communities around the world by focusing on one of the oldest and most influential civic tech organizations. Moreover, it illustrates how acting through technology should not only be understood in terms of programming: the data structures underlying civic tech applications do not just express ideas about social order, they should be regarded as attempts to actively shape society.

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(D) Open data, crowdsourcing and game mechanics. A case study on civic participation in the digital age

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One of the most celebrated characteristics of the internet is that it holds incredibly large amounts of data. It is also one of the most problematic characteristics of the internet. There is an overabundance of data generated on social networking sites, user comments on media outlets, review platforms, and governmental data sources that is shaping the production and sense-making of knowledge based on the gears of correlation rather than those of explanation (Andrejevic 2013, 17). Yet there are still few models for the average citizen to easily explore data sets, analyze information, run model-based algorithms, share information, and collaborate on projects that aim to enhance civic participation.

We suggest that computer supported collaborative practices such as crowdsourcing, which were developed by or derived from open source cultures and adapt one of the founding internet rules of free information exchange, provide a useful starting point to develop new forms of civic participation. Crowdsourcing pools together the efforts of various groups of people so that information regarding a particular topic can be put into order (Howe 2006). Successful crowdsourcing projects have been completed in various fields (Estellés and González 2012; Gauvin 2015;) and have been both greeted euphorically because of their assumed democratic potential of sharing ideas, knowledge and skills in a transparent way (Benkler 2011; Shirky 2010), and with criticism for its potential to exploit intellectual labor and innovative creations for little or no reward (Busarovs 2013; Cabiddu et al. 2012).

The aim of this paper is to shed light on the dynamics of civic participation, media agency, and data practices. We analyze an investigative journalism story run by *The Guardian* as a case study that combined open data, crowdsourcing and game mechanics with the purpose of engaging readers. In 2009, the British newspaper *The Telegraph* received almost two million documents containing information about UK Members of Parliament's (MPs) expenses. *The Telegraph*, following traditional journalistic practice, assigned documents to the reporters with the aim of revealing as much information as possible. While this led to several stories that would trigger a major political scandal anchored in the UK's parliamentary expenses and the misuse of allowances by the MPs, most of the data was not examined due to time constraints. A month later, the rival newspaper *The Guardian* received the documents and decided to test a new approach, following procedures of *Wikileaks* by opening the files to the public . *The Guardian* invited the public to join an alternative investigative journalism crowdsourcing campaign, in which readers were asked to sieve through the large set of leaked documents (GNM Press Office 2009). To do so, *The Guardian* created its own

microsite and app for mobile phones making about 450,000 documents openly accessible for their readers with a simple interface to guide them. After reading a document, each user had the possibility to flag documents as "Not interesting", " Interesting but known", "Interesting", and "Investigate this!". Additionally, the interface built by *The Guardian*'s data team contained a progress bar and a leaderboard, which are basic game elements. The progress bar showed how many of the available documents have been reviewed and the leaderboard displayed a ranking of readers based on the number of documents they examined.

This accelerated the analysis tremendously. The crowdsourcing campaign managed to attract 20,000 readers to review 170,000 documents in the first 80 hours, involving the users in a joint investigative journalism initiative with a 56% visitor participation rate. This success was achieved by a small group of developers and almost zero cost on infrastructure. But the success was not measured only by the stories discovered by the users or the speed in which they combed the data, but the high capacity of *The Guardian* to mobilize users to participate. This is interesting for several reasons. First of all, instead of an activist hacker organization, it is an established mainstream news organization who adopted practices from open source cultures by sharing and collaborating openly with the public in a joint alternative investigation geared to question the political establishment. In a time when datafication raises concerns about technology taking over decision-making processes, *The Guardian*'s data initiative shows that such practices can be used to enhance civic participation, allowing people to interact with the data. Secondly, opting for a crowdsourcing approach, *The Guardian* acted *through* technology by creating tools to engage readers in the investigation. The system primed the readers to help analyzing a large data set, thereby shifting the power on who decides what was being reported. And third, the interface incorporated game-like elements like a leaderboard and a progress bar to further motivate readers to participate in the system.

The Guardian's initiative shows how established news organizations can act through technology to foster civic participation by employing game mechanics and adopting practices from open source cultures by making data accessible to people who usually do not have access to it. This highlights the need for expanding the notion of data as an assemblage of monitoring technologies that collect information which is stored in silos, analyzed by algorithms and represented via digital interfaces. Crowdsourcing, as introduced by *The Guardian*, highlights how certain problematic aspects of datafication can be addressed by acting through technology in ways that support civic participation. The combination of an interface with game elements resulted in a successful model for civic participation which both expanded and maintained contemporary structures of knowledge production. On the one hand, by inviting the readers to take part in the investigation, the journalists at *The Guardian* partly granted agency to the public, effectively involving readers in the investigation. On the other hand, being the one who created the technology for users to interact with, *The Guardian* maintained its role as a gatekeeper and ultimately decided what would be published. The unique blend of data, crowdsourcing and game mechanics resulted in an innovative form of collaboration that added new elements to civic participation.

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