Going Off-the-cloud:
Artistic practices and initiatives for an offline sharing world

Abstract. During the last fifteen years, while everyday life is being increasingly datafied, an emerging scene of network practitioners from different fields has been actively involved in building alternative networks of communication and file-sharing. Among the practitioners of this DIY networking scene, a growing number of artists have been playing a crucial role in offering alternatives and critical perspectives. The aim of this paper is to present and discuss these particular initiatives, while locating them within a context and relating them to the needs of the particular time-period.

Keywords: DIY networking, art, community networks, ad hoc networks, offline sharing, network commons

1. Introduction

In the Post-Digital period, there is no room left for promises or illusions. As Florian Cramer has nicely put it, after the Snowden disclosures users are more and more faced with a contemporary disenchantment with digital information systems and media gadgets (Cramer 2014). The other side of today's datafied world is the one shadowed by what we don't know about the networks and the platforms we are using. While our lives are becoming more and more transparent, network infrastructures are becoming invisible and little do we know about how processes and architectures work. The networked world is a world of opacity and this is gradually becoming one of the fundamental asymmetries in the manner that users relate to the networks. Artist Julian Oliver (2014) suggests that "without edges we cannot know where we are nor through whom we speak", while artist Danja Vasiliev also remarks that "we hardly know what our device does behind our back" (Vasiliev 2014).

Reaching the point where 'the internet does not exist', where all we know is the presence of the Cloud, new facts need to be taken into consideration (Aranda et al. 2014). When technology is becoming invisible, we as users at the same time are losing our rights on it, Olia Lialina claims. We can no longer protect or delete our files, we cannot get them back, nor can we see technology itself (2012). The emergence of the Invisible User is therefore according to

Lialina more important than the one of the Invisible Computer. In the era of stacktivism[1], we slowly realize that we might no longer have an understanding of infrastructures or have access to them. The ‘stack’ ‘staged the death of the user’ and allowed other nonhuman Users, like the sensors and the algorithms, to become actors (Bratton 2014). This phenomenon can also be understood as the blackboxing of society and culture (Pasquale 2015). The sciences of behaviorism, game theory and cybernetics which are prevailing today have assisted in the formation of a system which is recording it and predicting it all, carefully exposing only its ‘inputs’ and ‘outputs’ (Galloway 2010). As Latour has written “the more science and technology succeed, the more opaque and obscure they become” (1999). What was a constituent element for the cybernetic philosophy, of how entities and systems would be conceived, is now becoming a condition that dictates our networked everyday life. Contemporary infrastructure space has become “the secret weapon of the most powerful people in the world precisely because it orchestrates activities that can remain unstated but are nonetheless consequential” (Easterling 2014). So what could be done under these circumstances?

Networks should be made visible, computerized systems should become transparent, and technologies should be made responsive and available, Saskia Sassen writes (2011). The right to infrastructure can be reclaimed by reclaiming and reappropriating networks and infrastructures (Corsin Himenez 2012). But for this to happen, a new form of ownership supported by a new form of literacy, directly related to infrastructures, seems to be needed. This suggestion is in accordance with what Greenfield has also framed as a need for translators, for “people capable of opening these occult systems, demystifying them and explaining their implications” to the others (de Lange de Wall 2012; Parks 2010; Greenfield 2015).

During the last fifteen years, while everyday life is being increasingly datafied, an emerging scene of network practitioners from different fields has been actively involved in building alternative networks of communication and file-sharing. Building their own infrastructures by using open hardware and software, they have been developing and communicating models that can be considered as current counter-infrastructures, as alternatives that aim to provoke change of a bottom-up structure. Community networks, ad hoc offline networks and local WiFi access points are examples of such infrastructures that users themselves can own, manage and control. Among the practitioners of this DIY networking scene, a growing number of artists have been playing a crucial role by offering alternatives and critical

1 The term “stacktivism” derives from Benjamin Bratton’s ‘Black Stack’ (Bratton 2014).

perspectives. The aim of this paper is to present and discuss certain exemplary initiatives within the time-period they emerged in.

2. From organizational aesthetics to the network commons

“Don't hate the machine. Be the machine.” Matteo Pasquinelli wrote back in 2004, addressing a call for “radical machines” that would function “as places of autonomy and autopoiesis” which would allow the sharing of knowledge, tools and spaces (2004). Just when web 2.0 was about to emerge, such responses as ‘radical machines’ could already be seen coming from the field of art. Becoming the machine, becoming an apparatus or a network could be translated as designing a set of relationships, deciding the topology and the protocols that will define the organization between links and nodes and the exchange among them.

This idea of becoming the machine or even the system and the node, however, can be already traced back in previous decades of art history; Mail Art, the Fluxus as well as Systems Art, are the predecessors of Net and Network-based art. Hans Haacke was writing in 1969: “The working premise is to think in terms of systems; the production of systems, the interferences with and exposure of existing systems. Such an approach is concerned with the operational structure of organisations, in which transfer of information, energy and/or material occurs” (Haacke in Graham & Cook 2010, pp. 52-53). Process was primary for the work which was commenting on the influence of cybernetics, on the systematization of society and lived experience (ibid). Mail art on the other hand, was an early community network born and expanded as a virus by artists who were exchanging small scale works using the postal system or sending instructions for the creation of DIY products (Bazzichelli 2013 p.73). Participation, sharing, openness, and inclusiveness were fundamental features for an early network that somehow opened the way for the early net art communities that followed. These artistic interventions and project were proposing an open channel of communication and free exchange.

“To analyse networking dynamics therefore requires reflection and consciousness in the use of technology and media” Bazzichelli argues (ibid p,77) and this is a process that artists building systems and networks greatly need to engage in. Olga Goriunova in her book about art platforms similarly remarks that “the art platform is a conceptual device that allows for a differentiation and problematization of networks... It is not only a way of looking, but also a dynamic of assembling and coming up with such a body” (2012, p.3). In order to underline and express this dynamic of assembling that can be found in art, Goriunova uses the term

organizational aesthetics that is more than a way of looking. "Organizational aesthetics is a process of emergence and a mode of enquiry that gives us a way to understand a digital object, process, or body" (ibid p.7). Adopting this term, Fuller also notes that the aesthetic undertaking can be found "in the development, movement and transformation of a loosely, precipitously or precisely assembled system of people, technologies, words, signals, the sense of those cohering, evaporating and reshaping over time" as well as "in the ethical dimensions of relations between processes, forms of access, cultures and their carriers, whether they are people, languages or technologies" (Fuller 2010, p.4-9). Similarly, we can recall Lovink's codeword about 'distributed aesthetics' that is in accordance with an approach that "no longer highlights technology as something revolutionary or disruptive" and that manages "to point to the social formations" that the technologies of connectivity provoke (Lovink 2008, pp. 226-227).

Taking these last points into consideration, that is the assembling not only among people but also among languages and technologies and the attention paid on issues of access, openness and inclusion when such networks are developed, this paper presents and discusses a series of appropriately selected alternative DIY networks, platforms and initiatives that are being proposed by artists as a response to today's datafied and controlled connected world. At the same time this paper examines these organisational dynamics as decisive factors towards the formation of what Armin Medosch framed as Network Commons (2014a). These new infrastructures may involve both social and technological topologies and may be based on the fundamental cultural commons such as the languages, the affects and the codes. It can also be suggested that these infrastructures are significant, if we follow the thought of Hardt and Negri (2012) in that they are "constructed, possessed, managed and distributed by all". To return to Pasquinelli's older call, becoming the machine nowadays, can only be understood as commoning the machine and therefore assigning to it new properties and values.

3. DIY networking & Art

The fundamental idea behind DIY networking is that it offers its users the possibility of ownership of the infrastructure as well as of all generated digital information (Antoniadis & Apostol 2014). Being based on affordable infrastructure, open source software and hardware and on topologies that are distributed or decentralized, this approach opposes today's centralized control, formulating "an interesting alternative for an autonomous option for communication" (Antoniadis et al. 2014). Local offline networks not only ensure connectivity

based on physical proximity, offering new opportunities for a combination of virtual and physical contact among diverse people, but also allow for anonymity and protect privacy, thus creating feelings of ownership and independence (ibid). DIY networking can be regarded therefore as a substantial alternative to today's centralized communication, escaping the fears of surveillance and commodification of our datafied world.

As earlier suggested, the aim of this paper is to locate certain exemplary artistic interventions, employing a DIY networking approach within the time-period that they emerged in. In order to present and discuss the significant artistic contributions in this field, the paper proposes and follows a categorisation of offline networks, on the basis of their services and aims: Community Networks, Tactical Mesh Networks, Toolkits for offline interaction and Fictional networks are discussed as the main fields where artistic initiatives can be located. While highlighting the role of artists for each section separately, at the end the paper draws a set of common conclusions in order to define the features and aims of these initiatives.

3.1 Community Networks

"The sleeping beauty of mesh has been kissed into life by the community"

Elektra (Medosch 2015)

The need to connect offline is not new. Although mesh networking has become especially known in the last few years, as a response to issues connected to state surveillance, data profiling and Internet blackouts, its first peak is located in the first half of the previous decade. This is when the well known mesh networks such as the Spanish Guifi, the German Freifunk, the Austrian Funkfeuer and the Athenian AWMN were built, establishing their first urban mesh nodes and links. While at first their popularity in the big metropoleis grew quickly, thanks to the greater speed that their connections offered[2], it soon became clear that the potentiality and the outreach of these networks could go far beyond that.

In his analysis about why it is important to build wireless free networks, written in 2006, Lenczner lists the following points (2008, pp. 228 – 229):

- *they are free as in speech*; they are based on network-neutrality and non interference.
- they are *free as in beer;* they provide free metropolitan traffic.
- they *raise awareness;* they make people aware of other ways of doing things.

2 especially compared to the low bandwidth of the Internet at that time.

- they bring in *alternative design values for networks*; they offer opportunities to have a group's priorities reflected in the infrastructure of the community.
- they invite people to *think globally but act locally*; they bring people together physically in order to build and sustain the network.

Similarly, Medosch, mentions that what was, and is, of central importance for community networks is the fact that they are formulating a different *dispositif,* based on the idea of network and communication freedom: they offer "the ability to connect without having to apply to a central point of governance" and the "ability of people to express themselves and communicate freely without top-down hierarchical control" (Medosch 2014a).

Artists were involved in the development of mesh networks from the very beginning. Medosch explains that James Stevens, founder of Backspace, and Julian Priest, artist-designer-entrepreneur, started designing a model of community networking already back in 1999, naming it at first 'Model 1' after Henry Ford's first mass produced car (ibid). Being interested in this "freedom to connect", from node to node, from user to user, they proceeded in building an actual mesh network prototype, called 'Consume.net', in collaboration with artist Alexei Blinov and a team of theorists, developers and admins working on relevant fields during that period (Medosch 2014b). The network was brought in different areas of UK with workshops run by the artists between 2000 and 2002. Right after London, this same team of people went to Berlin to influence the birth and creation of Freifunk, Berlin's popular mesh network in 2002 (ibid). The new 'growing' infrastructure of Consume came to a city with no functional broadband and infrastructure at the time and was activated by them and pioneers of wireless networking, along with artists, theorists and practitioners who were active in new technologies, radio and electronics in the city (ibid; Petersen). Interestingly, as Medosch explains, in Austria the free network Funkfeuer was also build by an artist, Franz Xaver, who designed it initially for a company but as the plan did not come through it passed to the hands of active volunteers (Medosch 2014c).

Apart from being initiators, artists in the last decade were also invited to use and animate networks in order to communicate their advantages to the citizens. Such was for instance the case of the SonicScene project which was developed in 2005 for the ISF network in Montreal; although the network is principally a network of independent free WiFi access points for the citizens of Montreal, the nodes were connected through a group of artworks. Artists Michelle Teran, Kate Armstron, Michelle Kasprzak and Tobias van Veen created fragmented artworks

that could be experienced when the visitor would drift from one access point to the next. “Each fragment is unique to its hotspot, developing a relation between wireless art and its physical space—one must travel to a certain hotspot to experience a particular fragment” (ile sans fil nd). The aim of the initiators was to encourage, discover and use creatively the nodes of the networks in the city. From the point of view of the audience however, this work could be also characterized as a location-based artwork, since it combines a physical world experience with the representation. A playful invite to discover the nodes of a mesh network was planned as a workshop by Adnan Hadzi and James Stevens in Luneburg in 2013. Wishing to empower Freifunk they invited inhabitants to walk around and discover QR code stickers that were adjacent to the nodes of the network (Hadzi 2014).

The involvement of artists in community networks is not to be traced only in known urban mesh nets of big metropoleis; their role has been especially significant in cases where community networks were built for distant villages, poor areas and socially isolated populations. Such an example were the efforts of activist Elektra, a member of Freifunk, in Valparaiso and Santiago. The Valparaiso Mesh for instance was a network aimed to build mesh nodes in a part of a city that was destroyed by a fire burn. Electra run workshops in a local hackerspace where she taught people the basics of wireless mesh networking and involved them in practical networking building (Nieto 2015). In these cases it is important to remember that free connectivity among inhabitants was meant to build not only an infrastructure after their needs, but also to build strong links among the members of the community and a sense of shared responsibility for its maintenance.

Other artists develop mesh networks, merging their artistic practice with activism. Such is the case of Christoph Wachter and Mathias Jud who are known for their sociopolitical projects and interventions, working with different groups and populations in different countries. The low cost routers they use for their mesh projects are empowered by a simple hack. Once a tin can is attached to the antenna of the router the signal becomes directional from round and can travel a bigger distance (Landwehr 2014 p.137). One of their well known projects in Hotel Gelem developed in collaboration with Roma Communities living in settlements in different cities (Wachter, Jud). Hotel Gelem was an awareness tourism project inviting citizens and tourists to live for some days with the community. As part of it, they also built a community network to empower the Roma people living there. This was the community’s greatest wish as the French government requires an address of a permanent residence and a bank account in order to provide a SIM card and therefore mobile Internet access (Landwehr, ibid p.138). For their network they used qual.net, a platform that allows free connectivity from device to device via WiFi and their low cost router antennas empowered with simple tin cans. Once the

community network was established they also equipped it with a bicycle carrying an antenna and a computer. When this bicycle was driven around, it would first collect the wishes of the community members for downloads and then when taken to the city it would connect to hotspots and download these requests. At a later stage internet connection was also provided to them through their neighbours (ibid p.139).

The works of Wachter and Jud as well as the initiatives taken by the artists mentioned before are all examples of networks designed for particular communities or urban territories. In a way, these are works that perfectly respond to what Matthew Fuller had written when discussing early forms of aesthetic organization: "The question is to make something happen: Don't moan, organize" (2010, 4). The significance of them can be found in this exact element, that is in the disposition and interest of the artists to use the technology in order to build social links that will endure the community, while also opening up prospects for an infrastructural literacy responding to the community's needs.

3.2 Tactical Mesh Networks

The use of tactical mesh networks is often connected to cases of emergency. In periods of insurrections or of environmental disasters, when Internet black outs might occur, ad hoc networks can establish communication within a vicinity; connectivity used in this case is independent of the default one which is no longer functional. Ad hoc networks are most often dependent on mobile devices or on routers with mobile clients, formulating a distributed network being called on demand. Hu et all explain that "an *ad hoc network* is a collection of wireless computers (nodes), communicating among themselves over possibly multihop paths, without the help of any infrastructure such as base stations or access points" (Hu et al. 2003, p.175). The topology of such networks is therefore dynamic and in constant change; a node is free to connect to any other node creating singles sessions of data exchange, whereas failures or drop outs do not significantly affect the network (Damiot 2015). It is robust and flexible thanks to its independent nodes. Nodes cooperate to send packets to each other, allowing messages to spread like viruses. Although 'ad hoc' is the term most often used in relevant literature for such networks, I prefer the use of the word 'tactical', as it implies the need and the intention behind the deployment of such networks. This term also clarifies how tactical mesh networks differ from community mesh networks, although they often share the same infrastructure.

A known recent example of an Ad Hoc network is Firechat, which became especially known

during the time of the student protests in Hong Kong in 2014. Firechat is an app., launched by the Open Garden Start Up company, which allows users who are at a certain proximity to communicate with each other with no internet access; using Bluetooth or Multi-peer connectivity on their mobile devices suffices. Firechat though has not been considered secure; it is public, with no encryption, thus making it possible for everyone in the particular area to read the messages being exchanged (Baraniuk 2014).

Activists and artists have been responding to the emergency conditions with tactical mesh networks and actual tools, involving devices and technologies that the citizens either already have in their possession or may acquire at low cost and set up themselves. **Fluid Nexus** (2009) by Nicholas Knouf, for instance, was a model that in a way resembles today's Firechat. It was "a mobile phone application designed to enable activists and relief workers to send messages and data amongst themselves, independent of a centralized mobile phone network" (Knouf 2009). Planned for peer-to-peer, node-to-node connection, the network necessitated the physical movement and presence of people at the same location. Once the application was downloaded from the web to the phone, text, images, audio and video could be transmitted using blue-tooth anonymously from one device to the next. Messages were encrypted when stored at the device but not when sent to the next node. Knouf's project though raised concerns in the US for the reason that it could also become a weapon in the hands of terrorists having thus a negative rather than a positive impact.

Qual.net (2011), by Matthias Jud and Christoph Wachter, mentioned before as part of Hotel Gelem, is also an ad-hoc network project, created as a response to communication blackouts and natural disasters. The artists referred particularly to the need to connect freely and independently that arose after the shut downs of internet and mobile connections in Cairo in 2011 and the atrocious earthquakes in Haiti in 2010 (Wachter & Jud 2011). The interesting aspect of Qual.net is that it is a software and a mesh net at the same time. Joining the network is quick and easy via any device. Once a qual.net node is located in the area, the software can be instantly downloaded, installed and the new node can join. This is of great importance as no internet access is needed; the software can be downloaded and installed by any non experienced user. Computers, mobile phones and tablets can all become part of the network. Chat, twitter function and movie streaming are all possible. Therefore Qual.net offered a wide spectrum of options that users could install and use according to their needs, when wanting to connect to other people nearby.

Tactical mesh networks are therefore activating at the same time nodes and people in order to facilitate communication. As Galloway and Thacker (2007 p30) have suggested, they can

offer opportunities for “political action in the network”, “guided deliberately by human actors”. Compared to community mesh networks, the case here is not only about users building up and maintaining a node, but about users actually activating the nodes purposefully only when needed.

The field of art has presented different examples of ad hoc communication, often with a critical, playful or challenging disposition towards the structure itself. Ad hoc networks have also been associated to sneakernets and clandestine modes of communication, where information is transmitted secretly and anonymously to serve different purposes. One suchproject is **Dead Drops** (2010) by Aram Bartholl, an ad hoc network of USB sticks mounted on walls in cities around the world waiting for users to go, attach their computers and share files surpassing fears and concerns of copyright and trust. Another playful example is Telekommunisten’s **Deadswap** (2009/2015), a social game of exchanging data in USB sticks, notified through an anonymous SMS gateway. In such cases, questions arise for the very use and functioning of such networks. *How easy it is for users to trust and organize their communication or file sharing through a network? Does it really work?* Telekommunisten purposefully uses the provocative descriptions ‘platforms of miscommunication’ for their works. Their project **r15n** (2012) was a great example of such a critique inviting people to use an ad hoc phone network in order to try and communicate with each other when phone calls and messages come in randomly. The ‘revolutionisation of communication’ as the artists called it, highlighted the fact that merging the social and the technological does not necessarily lead to a success. Ad hoc organization however, might not be such a simple task for the citizens of the connected world.

Off-the-cloud networks

> *The user of the future will own her own computer. She will own and control her own identity and her own data. She will even host her own apps. She will not be part of someone else's Big Data. She will be her own Little Data. Unless she's a really severe geek, she will pay some service to store and execute her ship - but she can move it anywhere else, anytime, for the cost of the bandwidth.*
>
> *‘Future User’, Lil Data* (2015)

The challenge for the future of DIY networking may successfully provide tools for our networked everyday life. Just like community network infrastructures appeared in relation to the restrictions of early internet connectivity and ad hoc topologies responded to times of emergency, new counter-infrastructures are expected nowadays to provide users with the hardware, the platforms and the knowledge that will help them escape the sovereignty of the Cloud. We are now witnessing the phenomenon of "States … evolving into Cloud Platforms just as Cloud Platforms come to take on traditional functions of States" (Bratton 2015), allowing the interests of the market and the government to meet. Consequently, what Castells once called a 'space of flows' (1996) is now being divided into many privately owned internets. Facebook, Google and Amazon are examples of Cloud Platforms, which store the data of users while the latter have no control over these data after uploading them. As Miss Data and the Israeli pirates write about their work **the Internets** (2015), in which five routers generate five closed internets, the internet space is now nothing but a monitored space, governed by corporations. Fears about constant surveillance and the commodification of users' data are directly connected to the formations of the cloud(s).

Having this contextualization as a starting point, I wish to refer to a new family of projects introduced by artists and hacktivists and examine them as potential counter-infrastructures and 'off-the-cloud' initiatives. With the term 'off-the cloud', I wish to discuss a new constellation of offline WiFi access points, sharing networks, autonomous mesh networks, personal servers and syncing platforms that together not only bring in alternative infrastructures but also communicate to users the essential new forms of literacies needed for using and appropriating them. In other words, it is not only about sharing and storing data safely and locally but also about knowing how to set up the system, how to use it, maintain it, control it and own it. It is not enough only knowing that you can share locally files with your colleagues; it is important to know how it is done and what other possibilities such a system has.

The projects discussed in this section are introduced by their initiators mostly as toolkits. All information about their set up can be found online, while some have plug-n-play ready solutions which are sold by the artists almost at the cost of the equipment used. Instructions, fora as well as public talks and workshops are often planned in order to support them. As it will also be shown, off-the-cloud toolkits are by their nature open, gaining the life and the features that their owners want them to gain.

One of the predecessors of today's projects addressing the need of a critical perspective to centralized infrastructures was *Hive Networks, a* project initiated by Alexei Blinov, Vladimir Grafoc and Ciron Edwards of Raylab, which was developed in 2006. Described by their creators as networks that could "watch, listen, sense and touch the world around them", **Hive Networks** (2007) were designed to "actively source, distribute and create content" promising to "turn the world on" and to empower users with autonomous networked systems (hivenetworks nd). Nodes of the network could therefore capture data, disseminate data and store data. The project emerged in a period of 'embedded capitalism' and of growing discussions around the 'internet of things' and its invisible connections (Medosch 2006, p.235). To respond to this condition, artists used a logic addressed as 'creative exposure' inviting users to learn how to build and set up their own devices (Granof & Blinov 2007). *Hive Networks* was based on open hardware, open software and open spectrum (WIFI), and at the center of its philosophy was the idea that low cost, off-the-shelf technology could be repurposed to offer systems that users themselves could own and control. The creators of Hive Networks were making clear at the time that they were proposing a new model, a new creative solution. It was no longer "the artists asking technicians for a creative solution", but rather the engineer-artists who were proposing "a new framework for artists and other media practitioners", "a hiving network of desires and artistic creations" (Blinov 2006).

This idea of providing a new cell, a tool for artists to use as a starting point for their work is found some years later in Sarah Grant's **Subnodes** project. Subnodes (2012) is an open source initiative proposing an offline mesh network that users can set up themselves in order to communicate, share and distribute content within the immediate geographical location. The nodes are Raspberry Pi devices configured as WIFI access points, working as web servers not connected to the internet. The selection of a Raspberry Pi, a micro-computer used to learn how to program, is not of course accidental. Although she runs workshops open to the public, the artist is mainly interested in how it can be used by artists "to express ideas" and by educators to use it in their activities. "It is important to also ask people what they will do with the network, to make them think about it" she argues (Grant 2015). A derivative of Subnodes was her project **Hot probs** (2013), a WiFi access point, a Raspberry Pi where users could connect to in order to chat anonymously. This also brings to one's mind Dan Phiffer's well known project **Occupy Here** (2011), a WiFi access point built with an inexpensive router for the New Yorkers in Zucotti Park.

In the last few years, this attitude towards an open use of alternative infrastructures became more and more apparent. The toolkits discussed here, offer multiple functions and different services. One of the most well known examples is the **PirateBox** (2011-2015) introduced by

artist and NYU Professor, David Darts. Initially conceived as a local offline access point where users could connect to and share files, PirateBox became known as a counter-proposal to the piracy laws. The latest version of PirateBox does more than sharing though. Built with an inexpensive router and a USB stick, and configured with firmware of the artist, it also allows users to chat and to stream videos from the device while the possibility of creating a mesh network, connecting node to node, pirate box to pirate box is also under development. It is also important to mention that different variations of the PirateBox have been introduced by users and colleagues: such a case is for instance the Library Box, a portable digital file distribution tool especially addressing people working in education and healthcare. Similar to the Library Box is the **Datafield** (2013-2015) project by Henry Warwick, a Network Attached Storage Unit, that works as a Temporary Autonomous Field indexing and openly sharing files wherever it moves.

Superglue (2014) is a project that opens up to a different direction. This particular toolkit, using the same infrastructure with PirateBox, that is off-the-shelf technology, a USB stick and a modified firmware, offers users a web authoring tool and a small personal server in the size of a plug where their data is stored. While the toolkit was officially launched in 2014, its team – led by artist Danja Vasiliev- is working towards its next step and the creation of a social network that Supeglue would support. “We need to try to optimize it the whole time. It needs to stand for what we claim, to fulfill functionality and exhibit the qualities that it proposes” Vasiliev explains pointing out the disposition of the creators to constantly upgrade the tools that they make available (2015).

This shift towards off-the-cloud initiatives is also embraced and empowered by artists developing systems in relation to today’s existing infrastructures. Such an example is **Dowse**, a project by Jaromil and the team of Dyne, that aims to counterbalance the asymmetry of the Internet of Things and the automation that happens beyond users’ control. Dowse is a ‘transparent’ proxy for home network privacy that aims to connect objects and people in a new friendly, conscious and responsible manner. It offers users the possibility to become aware when new devices connect to their network notifying them with a light signal and a noise and to decide what kind of access is granted to them, which “flows of data comes in and which goes out”. At the same time it filters web traffic removing undesired content and advertisements. Dowse just like Superglue and the other aforementioned initiatives place the user in the center of their design, highlighting the importance not only of awareness but also of decision and permission for their data.

Off-the-cloud projects are initiatives still in progress at the time of writing this paper. Artists keep working on them, while offering them to the users for further exploration and use. The right to infrastructure signals the rise of the prototype Jimenez writes and he interestingly refers to Fuller and Haque (Corsin Himenez, ibid, p.12). Prototypes are always 'pre-broken', open to deconstruction and re-assembling. They are actually released as such, so that they can be re-used and re-purposed. This might also mean tools that are inexpensive and easy to build. As Vasiliev says, the point is to use the "existing topologies and infrastructures but separate them from the topology of the internet. Maybe there is no way for an individual to own infrastructure. Maybe we should use new ways to use what we are provided with. This would be much more pragmatic" (Vasiliev, 2015).

Speculative Networks

Apart from the tools and prototypes that the artists contribute with to a wealth of user-owned and controlled infrastructures, imaginary or future scenarios for networks and the sharing of information are also being proposed through works presented as artworks. Often with a speculative character, but yet again functional, these projects discuss issues of surveillance and the possibilities for users' empowerment over networked infrastructures. Sharing features with what has been addressed as critical design or design fiction they tell stories about optimal and playful future worlds of connectivity and sharing.

Trevor Paglen known for the way he exposes infrastructures and materializes surveillance introduced in 2014 the **'Autonomous Cube'**, a project for exhibition spaces with a double mission. Having the appearance of a minimalist sculpture, the cube is a Wi-Fi access point that routes all traffic through Tor, through a network of distributed computers that anonymise users' data. The sculpture is meant to be seen and used by the visitors and the stuff. It is both an artwork and a tool, a functional alternative that in a way takes advantage of the art context in order to communicate and empower the urge for awareness towards data surveillance. Paglen goes against the 'abstract' and 'mystifying' words we use to understand mass surveillance and the Internet and words like the cyberspace or the cloud inviting people to observe and use a tangible infrastructure (Paglen 2014).

A different use of a WiFi local access point is made by Nicholas Knouf for the **'Sylloge of Codes'**, an installation project based on an offline sharing network. Visitors in this case are invited to connect with their devices and contribute to a resource of ideas for the future of surveillance-free communication. Starting from the fact that encryption algorithms are less and less trustworthy, Knouf turns to imagination and asks visitors to come up with ideas for

languages and ways of communication that the algorithms cannot read. Having the appearance of a box of secrets or a box of wishes, with a router hidden within it and a projector showing the different submitted ideas, the work opposes the opacity of today's technology with a collection of ideas proposed by users for users. "Maybe you had a secret language as a child. Or you communicate the most amazing insights through a poem. All of these methods are potential ways to resist the NSA or the GCHQ." (Knouf 2014a) When one enters an idea, or a code, he can get another one submitted from a previous user in return" . Knouf proposes therefore a collection of "possibilities for resistance" beyond encryption which aim to re-activate language and go beyond encryption in the "we-are-all-too-aware" condition. (Knouf 2014b)

The movement and potentiality to move freely towards any node and connect to it that characterizes ad hoc networks inspired Danja Vasiliev to imagine a parasitic ad hoc network where the movement and the potentiality of the network is lived and experienced by users who become the nodes themselves. Taking advantage of the city transportation system Vasiliev envisioned **'Netless',** a system where nodes would either be attached to carriers or carried by citizens-users. As transportation systems in most cities are well developed networks with nodes of different scale, transmitting messages through such a topology and through the movement of the inhabitants can allow messages to travel incredibly fast and efficiently. Messages are exchanged anonymously when nodes meet. No messages are to be logged and all messages can be encrypted but all messages are delivered to all. This means that netless is proposed as a network for ephemeral and anonymous communication in cases of need that concern the many (Dragona 2014). It is proposed as a network for tactical and not private communication. It is a safe way to allow information to be spread like a virus in times of insurrections and black outs when connectivity is endangered and not considered safe.

The future of community networking was discussed by James Bridle for his '**Right to Flight'** project during a residency in London. The project was an installation, an event series and a research program conceptualized and led by the artist. Aiming to address issues of surveillance and especially the urge for citizens to regain the power over infrastructures, the artist built and hided a network within a military surveillance balloon that flew over Peckman. Bridle used the model of '**Occupy Here'** by Dan Phiffer to create a flying dark net, which enabled local inhabitants to connect to it anonymously, to communicate and share files. The balloon also carried cameras and tracking devices that connected to Raspberry Pis and transmitted captured data to the connected public. In a time that Google develops its high-altitude balloon network to connect rural and remote areas to the internet, the artist took a different approach. Inspired by Nadar's utopia, a 19th century air photographer and balloonist

who was arguing that by using the balloons “to ascend to the heavens” mankind would be saved from wars and major problems, he tried to rediscover this “in the possibilities of contemporary technologies”, and by returning some of the power lost to “the surveilled”. (Bridle 2014) Believing in the democratization of technology that is otherwise used for surveillance, Bridle not accidentally chose on one hand the dark hellkite, that has a direct reference to militarization, and on the other open source software and hardware opening up technologies to the users.

The future of a community mesh network was envisioned as a flock of drones by roving security consultant Eleanor Saitta, architect and designer Oliviu Lugojan-Ghenciu, and architect Liam along with the team of Superflux. **‘Electronic Countermeasures’** explored the design, functioning and manufacturing of such a drones network for an intervention performance that took place in Glow festival in 2011. The flying drones could form their own place-specific, local, WiFi community and pirate file sharing network. The project came almost at the time when the Pirate Bay was researching the possibility of such a prototype. “With the development of GPS controlled drones, far-reaching cheap radio equipment and tiny new computers like the Raspberry Pi,” small drones should be able float some kilometers up in the air and be used for sharing files (Pirate Bay Blog 2012). The idea was that at the core of the network low orbit servers would be used which would hold proxies and reroute the torrents to hidden servers. When artists are building networks, it is important to notice how they use and expose topologies, highlighting their properties and features. ‘Electronic Countermeasures’ offers a tangible understanding of the topology as drones are nodes moving and exchanging files in the air.

Distributed networks assist in the anonymisation of data – what Tor does- while they are also more secure; when one node breaks, the network is still robust. This element is highlighted in the latest film of Laura Potrias documenting Ai Wei Wei and Jacob Appelbaum collaborating for three days for a common project which took as a starting point the Snowden revelations and the material that Poitras was given by Snowden in order to communicate it to the press and the public. **‘Panda to Panda’** was a performance, a statement and a provocation that gave birth to a distributed network of leaked information. The two activists-artists printed leaked information, destroyed it and used it to stuff a number of cuddly panda toys. A micro SD memory card was placed inside each panda at the same time. The toys were symbolically sent to art museums of big capitals considered as a secure place to store information. Panda to Panda referred to the necessity to turn towards Peer to Peer topologies while playfully also referring to species in danger, to natural treasures, and therefore to our free communication being endangered and getting lost (Poitras 2015). As the work was made in Beijing, it is also

an ironic metaphor to the secret police called Panda in China (ibid). From another perspective, Easterling interestingly notes the following in relation to the use of pandas: “Excessively soft and cute, the panda is a streamroller of sweetness and kindness – an arm twisting handshake that disarms and controls with apparent benevolence. The pandas according to her were used to “exploit a currency in values, social signals and sentiments”

The cube, the box, the model of transportation system, the balloon, the flock of drones and the cuddly pandas look at first as playful or poetic views for the future of our networked communication and the future of offline networking. Objects are repurposed in order to serve offline connectivity. When asking how artworks as such can provoke change, it is important to take into consideration the stance the artists take when engaging with future scenarios. “My job as an artist is to try to see changes taking place” for instance Trevor Paglen argues whereas James Bridle says that he wants to make network objects visible (Kiss 2014, Huffington 2014) . Strong metaphors are needed he claims and this is what exactly these projects offer; ways of understanding, seeing, using the elements of networks and questioning the possibility for a positive turn at the same time. Like it happens with a critical side of design fiction, these networks/ objects tell stories “about worlds that could or should become”. (Bleecker 2012)

Conclusions

As the paper has shown, artists have been involved in different directions of DIY networking which respectively respond to different needs of today’s users. Going offline and off-the-cloud not only is a way of escaping data surveillance and commodification but it also assists in building new bonds among a community, in connecting in times of emergency, and in having control of one’s data. Despite the different features and aims mentioned, the following remarks can be made in order to draw some common conclusions about the initiatives, toolkits and forms of organization coming from the field of arts.

Firstly, all networks discussed follow a user-centered approach. The human and non human elements that a network involves are balanced by always allowing the users to have control of the nodes of the network; setting them up, controlling them and sustaining them. In the era of algorithmic automation and control, it s important to remember what Munster and Lovink wrote, that the rise of networks should be made understood as an all too human behaviour (2005). Whereas as Medosch says ‘in ubiquitous computing, it is usually the devices which

get smarter and the people who remain stupid' (20060, in the cases of such initiatives a 'new Internet of People', following here Nold and van Kranenburg, and can emerge against the Internet of things (2011).

Secondly, the topologies of DIY networking are exposed and understood by a merging of the social and the technological. As a user is always behind a node and in control of a node, it is easier to realize the edges and nodes, the architecture and potentiality of the network. This idea of "becoming the machine" that Pasquinelli mentioned can be understood as becoming the node and gaining control of the network.

Thirdly, all infrastructures of different scale are based on open software and hardware leaving open to the users the possibility for modifying and even repurposing them for their own needs; this way not only the DIY but also the DIWO ethos is encouraged embracing the logic of thinking, sharing, working together. This in a manifestation of what Hardt and Negri have stated when they argued that "being with" is no longer enough"; a "doing with" is necessary (2012). Alternatives based on collaboration and sociality are introduced to spread and teach people how not only to modify and use infrastructures but also to make decisions, possibly based on criteria which are qualitative and humanistic (Bollier Hellfrich 2013). Staying out of the market of centralized systems and platforms, a new system and theory of value is embraced. Encouraging forms of exchange economy and providing tools and knowledge freely and openly, a significant effort is made for social value to outbalance market value, for sharing networks to surpass zones of property.

Fourthly, and in continuation of the above arguments the infrastructures proposed can be seen as part of the new 'Network Commons' as Armin Medosch puts it. Although Medosch refers primarily to the community networks, this can greatly stand for the wider family of offline sharing networks as they are systems in terms of infrastructure and content that are meant to be constructed, possessed and managed by all. Through such platforms, users are invited to "to speak and think, to become informed and to participate", as Stavrides has put it for the necessity of the contemporary commons (2010). The making of the common in the case of infrastructures is therefore a process based on potentialities, skills and affects of the users and this can be approached as meaningful acts of commoning.

Finally, to sum up all of the above and to understand the contributory role of art, it is useful to turn again to the notion of organizational aesthetics used by Goriunova and Fuller as well as to the distributed aesthetics coined by Lovink. The forms of organization artists introduce as part of a DIY networking practice capture not only social and technological topologies but

also experiences, languages, codes, driven we could say by affect. Just like Goriunova wrote for the art platforms that she studied, one can point out about artistic offline sharing networks that they are not only a type of practice, but also types of networks and network organization; following her approach, these forms of organization mobilize and reinvent network systems and cultures, conditioning and co-creating new forms of life (Goriunova 2012, p.3). To understand this, one only needs to think how a community network might have changed the life of the Roma, how a PirateBox toolkit facilitated a university course or how a flying mesh network in a balloon in the sky could have triggered discussion about free communication and sharing in the networked world. This is how the "cultural, the individual and the social" is constantly produced and organised (ibid).

The special role that the artists seem to take, is therefore the one of the facilitator, the mediator, the commoner of knowledge and experience. Perhaps we can see them as those that can invite us "to a participatory journey aiming to capture the not yet described and yet visualized, going beyond poles as real, virtual, new, old, offline, online, global and local" and therefore as the ones that can unite all these different elements in the experience of networking (Munster Lovink ibid). Or they might be the ones that respond to the exact need that Michael de Lange mentions:

"*We must shift attention from technologies that seamlessly blend in with everyday life, towards technologies that move people and enable them to move others'* (2013 p.83).

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