Félix Tréguer (ISCC-CNRS)

Alternative Internet Networks:

History and Legacy of a “Crazy Idea”

June 2017

Paper presented at the IAMCR 2017 conference in Cartagena, Colombia, July 16-20, 2017

Panel:
History of alternative networks

Working Group:
Communication Policy & Technology (CP&T)

Draft.

This research is supported by the European Commission, H2020-ICT-2015 Programme, Grant Number 688768 'netCommons' (Network Infrastructure as Commons).

This communication offers to look at recent instances of alternative communications networks – namely two Internet community networks that emerged in the 1990's in France and Great Britain – to draw lessons for similar contemporary initiatives. Highlighting the change of technical paradigm brought about by the Internet and revolutionary tones that it entailed, we first consider the case of the French Data Network (FDN). Founded in 1992 and still in operation, FDN was the first Internet access provider available to the general public. It navigated the regulatory changes in the telecom sector by becoming increasingly tied to the emerging digital rights movement and contributing to the emergence of "critical Internet user" (Paloque-Bergès, 2015). Second, we turn to Consume.net, a British organization associated with the London counter-cultural scene. From 1999 to 20003, Consume.net took advantage of the new WiFi protocols to subvert incumbent telecom operators' hold on last-mile networks and promote a grassroots and locally-grounded approach of building and managing "wide area" networks (Medosch, 2014).

Based on existing literature, interviews with the founders of these initiatives as well as content and policy analysis, these two case-studies hold important lessons for today's community networks. While they confirm that community networks can emerge from diverse actors, with different motivations, political cultures as well as technical models and pricing schemes, they also show that these initiatives face two major challenges to ensure their sustainability: the articulation of the local and global scales in connectivity needs, and the need to build advocacy capabilities aimed at influencing regulatory developments.

1. Birth, Downs and Ups of the French Data Network

At the end of the 1970s, personal computers were finally coming to France. Magazines specialized in computer cultures reported at the time that more than 100,000 machines had been sold in France (Thierry, 2012, p. 55). In 1985, an official report claimed that 860,000 households possessed a desktop device. And by the end of the decade, France would become the first European market for PCs. Over that period, the number of computer clubs also rose significantly.

This rise of computer penetration and its growing use was significantly facilitated by the government's voluntarist approach. In 1978, when France was still lagging behind, the Nora-Minc report called on the coming together of computers and telephone networks and would launch the unique experience of the Minitel (Gonzalez & Jouve, 2002). First intended as a way of granting to the public access to database, it would morph into a large-scale social experiment to turn it into a communication device, with the creation of France's earliest virtual communities. At the end of the 1980's, a quarter of French residents had access to the Minitel. Though less popular, other computer networks were also accessible through dial-up connections, such as Calvacom, launched by Apple, and the American College in Paris.

All of these early experiences of popular computer culture, with their novices and "enlightened amateurs", formed the background against which the Internet would sweep the country. In 1992, the Cold War officially came to an end at Camp David and, as Request for Comments 1366 underlined in October of that year (Gerich, 1992), the Internet was undergoing such a "growth and increasing

globalization" that it would soon result in a historical democratization of communications. But in December of 1992, the signing of the North American Free Trade Agreement formed part of a mounting wave of neoliberal commodification which would soon profoundly alter the Internet's political economy.

1992 was also the founding year of the first French citizen-owned Internet access provider, French Data Network (FDN). FDN was not only first French CN, but also the very first Internet access provider open to the general public – one that has survived to this day. Based on interviews with FDN's founders and leaders, this case-study retraces its success and failures in navigating an ever-changing techno-legal regulatory environment, and its increasing politicization. This case suggests the inscription of CNs in a wide advocacy movement – in this case the French Digital Rights movement – facilitates the political framing of a CN and leads to positive cross-fertilization between advocacy on the one hand and the development of alternative architecture on the other. It also shows the need for community networks to first and foremost respond to the basic connectivity needs of its members.

1.1 The Birth of a "Crazy Idea": The Foundation of FDN

FDN was founded by Christian Paulus and a few of his friends, including Jean-Philippe Nicaise, whom he had met in the first French online communities and in the rising Parisian scene of computer enthusiasts. They had been exploring closed RTC networks like the Minitel, Calvacom, as well as the more open Usenet since the mid-1980s. In these "virtual communities," a lot of educational material and knowledge-sharing could be found. To them, these networks looked like a fantastic alternative to schools, giving people access to information they wouldn't be able to access otherwise, especially on Usenet (Paulus, 2016). The difference with closed computer networks like the French Minitel was clear, and the diversity and richness of content far greater in these open spaces.

But "joining in" these RTC networks was still a great challenge. At the turn of the decade, retrieving information from Usenet newsgroups over the UUCP protocol and exchange emails was still terribly long and expensive. Accessing these proto-Internet was a privilege reserved to those working in research and academic institutions. Some early commercial Internet service providers existed but their pricing models made them only accessible to a few businesses and to the rich. Some had managed to "hack" the Minitel by creating gateway services to other computer networks, but these services remained very confidential.

In February 1992, Paulus and his friends decided to move forward with a bold plan they had been pondering with for a few weeks (Paulus, 2016; Nicaise, 2016). Tired of waiting for public institutions and the few private companies operating closed computer networks to change their model to become more accessible, they decided to bypass them altogether. Their "crazy idea", as they called it at the time, was to create an access provider that would directly connect to North American servers where most of Usenet traffic was originated to carry it to their members. On February 12th, the clique met in a bar. Wanting to "open this emerging worldwide library to everybody," they decided to fund a non-profit under the 1901 French law on the freedom of association.

In May of that year, even before the organization was formerly created, they contacted UUNET, the U.S. service provider, to join the UUCP and SMTP crowd. And the next month, the French Data Network was formally created, with Paulus acting as the non-profit's director, and Jean-Philippe Nicaise as its treasurer.

The response among the early crowd of French computer-savvy people was immediate. Within two years, the number of member-subscribers across the country rose to 400, including about thirty for-profit and non-profit organizations who acted as proxies for their members. To communicate on UUCP and exchange emails on SMTP, they needed to subscribe to the incumbent telephone operators *France Télécom*, own microcomputers equipped with a modem and loaded with a UUCP free software like FreeBSD or NetBSD. Each of them paid an annual membership fee of 100 francs (15 euros) and a monthly flat-rate subscription of 180 francs for their dial-up connection with a generous data allowance.

The hub of FDN was located in Paulus' living room in Paris, and was formed by three NEXT computers and their attached UUCP modems, through which members would connect to the worldwide (mostly North-American) UUCP network. providing users with their own IP addresses, configurable email services. FDN also ran a file-sharing server from which members could download free software to manage their modem and configure their connection. The FDN community contributed to that software by writing bits of code, and translated English technical documentation and tutorials to make them more accessible to a French audience. Paulus even got national visibility among French Internet pioneers by making a translation of the Netiquette. Overall, things were operating smoothly, revenues were much better than expected and did more than cover for the expenses.

Soon, another opportunity arose. RENATER, the public state-owned national network for academic and research institutions, started promoting the promising Internet among the French educational and research world (see Schafer & Tuy, 2013). In his professional capacity, Nicaise was invited to join, and realized that RENATER was offering to subsidized Internet connectivity. So FDN took the offer. It reached out to RENATER later that year, highlighting their educational focus and the fact that their special prices for students and job-seekers. Within a couple of month, RENATER happily gave, for a symbolic price, FDN a special line of 64 kilobits/second to their data center open on the worldwide Internet, a CISCO router, a first batch of public IP addresses to connect their servers to the Net, as well as its FDN.fr domain name. The team was ecstatic and, around March 1993 after some engineering work, the new infrastructure was up and running, still on UUCP. Later that year, FDN moved from UUCP modem connection to IP connections and was able to offer real Internet access, allowing to connect directly to any IP server of the global Internet.

1.2 The Emergence of Digital Rights Activism in France

By 1995, FDN's cofounders had moved to other adventures and were busy developing their careers in the booming tech sector (today, one of them currently works at *France Télécom*'s Orange, another moved to California soon after the launch of FDN is now director of engineering at Google). In late 1997, FDN members elected a new young president named Benjamin Bayart and open a new period in the history of the organization.

In the second half of the 1990s, EU policies forced incumbent network operators to open up their legacy infrastructure to small and innovative ISPs. In a context of rapid privatization, regulation promoted both the unbundling of last-mile as well as facility-based competition and new companies began laying down their own network infrastructure (Michalis & Ruhle, 2001). This, along with the explosion of mobile telephony and the democratization of Internet access, made liberalization look like a success story: innovation in telecom services was dynamic and fast-paced, prices were low, and the number of Internet users surged.

In this context, the mid-1990s as an era of “renaissance” for what Stefania Milan (2013) calls “emancipatory communication practices.” Echoing the pirate radio movement of the late 1970s and 1980s, the Internet sparked a political movement of tech activists whose aim was “to bypass the politics of enclosure and control enacted by states and corporations” on the public sphere. They wanted to achieve a “structural reform at the grassroots level through the creation of autonomous spaces of communication. By emancipating other social actors from commercial communication services, they aimed to empower them to articulate, voice and convey their own messages without filters” (p. 10).

In France, this crowd of early Internet activists worked to provide Workers Unions and organizations involved in the Global Justice Movement with secure e-mailing, free hosting services, as well as innovative web-publishing tools (Granjon & Torrès, 2012; Papatheorodou, 2005). This led to forms of cross-fertilization: these new links helped to politicize these techies, while they also educated these older citizen organizations about what they saw as the Internet's original ethos and governance model: a network of equal peers communicating freely on a decentralized, end-to-end architecture, exerting bottom-up control on the tools used for communicating, in particular through free software. Most of these organization has the same non-profit status as FDN. To some extent, FDN had pioneered a model for citizen autonomous infrastructure in the digital era.

But the democratization of Internet access also entailed less rosy consequences, such as the development of e-commerce and online advertising. What is more, still in 1996, the French government initiated its first regulatory crackdown to boost its censorship and surveillance capabilities, in a context where the media contributed to the demonization of this new online public sphere. These trends added to the widespread feeling among the crowd of online pioneers that something nascent and beautiful was about to get dirtied by the old and corrupt world of money and politics, and which led to the creation in 1996 of the *Association des Utilisateurs d'Internet* (AUI) – the first French organization aimed at defending the civil rights of Internet users (Chemla & Bayart, 2016).

At first, FDN may have been one of the few ways by which it was possible to join the Internet. Within a few years however, partly thanks to FDN's new president, the non-profit became loosely connected to this emerging scene of Internet activists. For FDN's active volunteers, this citizen-owned and run Internet service provider seemed to be a natural avenue for resisting the trend towards commodification and political control over this communications architecture (Bayart, 2016). Through the leading members of the emerging digital rights scene did not necessarily perceived FDN's political potential, all shared the goal of equipping newcomers with the technical know-how and to cultivate an understanding of the Internet's political importance, allowing for the emergence of a “critical Internet user” (Paloque-Bergès, 2015).

1.3 Maintaining Technological Relevance: A Condition for Political Efficacy

But FDN had more pressing challenges than joining the fights for civil rights online. The more pressing question was how to maintain FDN's core activity, i.e. the provision of Internet access. To connect its network to the global Internet, it soon had to switch. Like fiscal authorities around the same time, RENATER decided that FDN was actually operating a commercial service and decline to continue dealing with the non-profit. FDN therefore switched from RENATER to Oléane, a business-to-business telecom operator who also provided batches of IP addresses.

Keeping pace with commercial providers proved challenging. And so with take-off of Internet access markets from 1996 on, a sizable portion of FDN members – around 10% of members in 1996 alone – left the group to join commercial alternatives that provided faster and cheaper Internet access, even though the later often replicated the walled-gardens and deprived users from the technical control over their communications (Rebillard, 2012). On the one hand, that meant that those who stayed were the most committed. On the other, FDN's user base was decreasing. Like it would later be the case for other Web-based services used by activists (Uldam & Askanius, 2011), community networks were among the first of many services and tools of the early Internet to face – and suffer from – a wave of commodification.

What is more, the new regulatory framework created a set of new hurdles for FDN. First the European directives that deregulated telecom markets led to a the imposition of a new legal definition for telecom operators, as well as new obligations. To be registered, FDN had to pay an annual registration fee of about 20 000 euros to the newly created national regulatory authority. The fee was designed for commercial players, and for FDN it was of the same order of magnitude as its revenues. To avoid this crushing financial burden, FDN declined to register and chose to remain under the radar (Bayart, 2016). Other alternative networks could not, like some small and medium businesses providing Internet access and which were not able to survive under these conditions.

Around 2005, when speeds increased by orders of magnitudes thanks to the deployment of ADSL technologies, the situation worsens. By that time, FDN had only 40 member subscribers, all of which kept using their slow FDN access only for very simple and old applications. The bulk of their Internet use relied on mainstream access providers.

To remain relevant in this new technological paradigm, FDN had to upgrade its infrastructure and move to ADSL as well. In theory, EU directives forced *France Télécom*, the incumbent, to open its networks to competitors, but in practice its pricing model made it way too expensive for a player such as FDN which was expected to invest tens of thousands of euros in the last-mile portions of the networks where it had subscribers. Fortunately, Benjamin Bayart knew very well how ADSL worked. Since 2003, he had been working at a mainstream operator on this technology, setting up their ADSL system (Bayart, 2016). After 18 months of doing some internal lobbying, of finding and talking to the right people, he managed to find someone in the business department who was ready to lease parts of its network to FDN through what are called “bitstream offers”. Rather than having to deploy its own infrastructure in the last-mile networks, FDN could rely on that on this much bigger operator in exchange of a per-subscriber fee. So in 2005, FDN was back in the game at the technical level and was again recruiting new members.

Under these new conditions, time would soon be ripe for a revival of FDN. Understanding what

drove this movement remains a question to be investigated. But to be sure, evolutions in Internet politics – namely the increasing concentration in telecom markets, the prominence of US-based online services and the vertical integration strategies of telecom firms moving into the media sector, the growing debate around online copyright – gave a new impulse around Internet policy issues, such as network neutrality, online censorship and surveillance.

In 2007, Bayart became more politically involved, addressing crowds of free software activists during public events. In one famous conference that gathered much viewership online, Bayart described the Internet's enclosure and growing centralization as a move towards a "Minitel 2.0". This conference stroke a chord in an activist milieu that was getting increasingly politicized. A year later, a new digital rights advocacy group, *La Quadrature du Net* (LQDN), was founded in France by Free Software activists to occupy the political space that had been left vacant by the end of the AUI and other similar groups around 2002, with Bayart originally acting as LQDN's treasurer.

Soon, coupled with the growing ability of a better-resourced digital rights movement to frame these issues at the political level, Bayart's advocacy in favor of non-profit Internet access providers led to a revival of the burst of movement a community networks across France. In 2010-2011, many events impacting the digital rights debate and FDN leaders played a role in them. Such was the case during WikiLeaks Cablegate, where FDN created a mirror site of WikiLeaks and helped channel donations to Julian Assange's organization to circumvent the banking blockade it was subjected to. During the Arab Spring, FDN set up modems and share numbers to allow Egyptian protesters to connect to the Internet through dial-up connections during the Internet shutdown, and partnered with Reporters Without Borders to provide VPN services to political dissidents. Echoing the glorious times of the Free Radio Movement, FDN formed part of a global crowd of activists resorting to decentralization and creative networking to help others circumvent the repressive policies of state authorities.

This was the moment when Bayart and other FDN active volunteers went on to motivate people across France to join and start building their own community networks. Rather than growing a single organization, or even the handful of other community networks already existing across France at the time, the choice was made to "swarm" in a decentralized mode by creating many local non-profit organizations, all under the French 1901 law on the freedom of association.

To coordinate these developments, share expertise and organize the legal and political representation of the movement, an umbrella non-profit organization was also created: The *Fédération FDN* (or FFDN). Today, FDN has 500 members, 300 of which are also ADSL subscribers. As for the Federation, it is now comprised of 29 local community networks across France operating in both rural and urban areas, using both wireless and leased landline networks, and whose combined number of subscribers is around 2500.

Today, important synergies are being developed between FFDN members, who enjoy a local foothold and have a real expertise in telecom matters, and advocacy groups like *La Quadrature du Net*. For French community networks, this cross-fertilization holds the promise of increasing their influence on regulatory matters at the French and European levels, better understand their legal environment and be able to engage in strategic litigation (FDN and FFDN have worked with *La Quadrature du Net* since 2015 to litigate against Internet censorship and surveillance, but has yet to litigate in matters more closely related to telecom policy). This in turn, will help create the

regulatory conditions favoring the values of communicational autonomy that it holds dear (i.e. on issues such as data retention or Net neutrality).

2. Internet on the Airwaves: The History of Consume.net

In 1984, that is twelve years before France privatized its own legacy networks, the Thatcher government sold some of the Crown's jewels by passing the Telecommunications Act and privatizing British Telecom. Neoliberalism was sweeping the country, and would take with it another British legacy, the left-wing Labour Party. In the 1990s, as neoliberal policies spread to the whole world, Tony Blair joined the frenzy. Successfully, he offered voters a third way between social-democratic and conservative politics. But in the U.K. as elsewhere, this foreclosure of the institutional political scene was contested by the new emerging and transnational Global Justice Movement, which pioneered many activist uses of the Internet.

In late summer 1999, two British artist-designers – James Stevens and Julian Priest, each in their early thirties – came up with their own “crazy idea” for a citizen network. The pair had met at Backspace, a hub for artists, designers and entrepreneurs that would likely be branded today as a hackerspace. Backspace had been founded in 1996 and for the three years of its existence acted as a cultural hub on Clink Street, on the banks of the Thames next to the London Bridge. Although its protagonists were not trained as engineers, nor did they identified as “techies.” But they had an understanding of the Internet's potential for alternativeness. As James Stevens recalls, at Backspace “the spirit of free networking and collaboration spawned by its passing lives on in the flow of activity and passion for [self-publishing platform] IndyMedia and peer-oriented exchange […]” (Garrett, 2006; Coleman, 2005).

At first, the project was about sharing a connection and laying out a fiber optic cable between a higher floor of Backspace and the building across the street. But they realized that old planning laws forbade the deployment of a telecom cable in a public space to entities that were not registered as “public telecom operators” (under the 1984 Telecom Act). Thankfully, around the same time, a new networking technology was appearing: Wireless Local Access Network (WLAN) and a protocol numbered 802.11b – the underlying technologies of WiFi.

Active between 1999 and 2003, Consume would soon confirm that technical and regulatory innovations – in this case the opening up of new frequency bands to unlicensed use for WiFi communications – can significantly alter the political economy of communications network and favor the development of alternative networks.

2.1 Building a Network and a Community on Thin Air

Now, Apple was advertising its new Airport device. Since the 1984 restrictions on public networks did not apply to radio transmissions, Stevens and Priest had found a way to circumvent the law to share Internet access. Soon, they realized that they could do much more than that. As James Stevens would tell CNN three years later, “anyone with a little techie knowledge can buy a simple base

station for just few hundred pounds which acts as the co-coordinator for a wireless network." He continued: "Then any user wanting to access this needs a card that links your laptop to the network which can be bought for as little as 100 euros" (Heikkila, 2002).

Because it was using the unlicensed 2,4Ghz band, WiFi "could be thought of as the networking equivalent of CB radio" claimed Consume's founders. It allowed for the building of an autonomous network where individuals, groups or organizations would relay Internet traffic to one another through their antennas. Functioning as a free, open local network, Consume could relay traffic to the global Internet through its members who had their own connection at mainstream ISPs and were willing to share these gateways. In that way, the network would "re-distribute access" while "promoting common ownership" of the network (Priest, 2000).

WiFi had another advantage: Although it was certainly the easiest configuration to put in place, the network did not need any fixed routing table between the nodes of the networks (antennas and attached access points). The protocol theoretically allowed for ad hoc reconfiguration, based on the location of new nodes. Thanks to mesh, a longer term project was made possible: the possibility of a flexible, self-configuring and resilient network was on the horizon, one that would grow along with the number of people and device willing to join in. The technology was not mature enough at the time (it barely is today), but the idea of grassroots networks based on mesh was already there.

The framing of the political potential of Consume was also linked to the idea of local network, against the global gigantism of the Internet. According to a WiFi activist quoted in 2002 in a Guardian article, "the real power of these networks will be manifest when local nodes connect to one another, so rather than offering isolated local gateways to the Internet, they provide an alternative public network for local communities (Mortleman, 2002).

For Armin Medosch (2014), a protagonist and prescient analyst of wireless community networks, Stevens and Priest understood Consume.net as "a techno-social system from the very start": "Their ideas combined aspects of social and technological self-organization. In tech-speak, the network they aimed at instigating was supposed to become a Wide Area Network (WAN). But while such large infrastructural projects are usually either built by the state or by large corporations, James and Julian thought that this could be achieved by bottom-up forms of organic growth […] Individual node owners would set up wireless network nodes on rooftops, balconies and window sills. Each node would be owned and maintained by its owner, who would also define the rules of engagement with other nodes. The network would grow as a result of the combination of social and urban topologies."

After a few weeks and months of trial and error with the help of skilled hackers, Stevens and Priest managed to created a local network involving dozens of participating organizations and individuals. In 2002, a Guardian journalist would describe his own experience in setting up his wireless node in these terms:

> "*Setting up a wireless access point for your street is less trouble than you might think. It requires an old PC (a 486 or better, so I mean "really" old), a couple of network cards – one wireless – and some patience. The Consume.net people can show you how, as can the many community wireless organizations around the world. I had some old equipment hanging*

around, and it's great to put it to some use. All I then had to do was point the antenna out of the window in the direction of a comfortable spot, drop leaflets through the doors of my neighbors and register myself on the Consume database. It was from the Consume database that I had my first visitor. Seeing a flickering light on my network hub, I knew someone was using it. It was Doc Searls, co-author of the Cluetrain Manifesto and top U.S. blogger, who is in Britain for a few days. "The Revolution is on, People!" he was to write later that day, "I haven't felt this jazzed and with-it since the Sixties." *Since then, he and many others have used the spare bandwidth on my internet connection*" (Hammersley, 2002).

Although there was no prior art or knowledge on which to rely, it was not the only such endeavor. Also in 1999, Adam Burns and others independently launched Free2Air to provide a radio backbone between different artistic hotspots across London. The idea of "free networks" was in the air, and Consume helped gave it the political framing that made it more salient. Soon, dozens of similar local initiatives spread across the United Kingdom and elsewhere in Europe. The know-how on how to create local radio networks was fast spreading, these groups' techies were busy refining methods for dynamic routing as well as free hardware-software tools. Meanwhile, the media attention devolved to the WiFi grassroots revolution was growing.

2.2 Advocating for Free Networks Against the Incumbent

Consume.net did not have nor need any bylaws, only a mailing-list. It was all about self-organization. Thanks to radio, the goal was to restore the fantasied original promise of a bottom-up communication platform. This was the time of the dotcom bubble, and telecom operators were rushing to reap these new markets, Consume aimed to go against the trend of the Internet commodification. It was entitled self financed by its users, and although one foundation approached the group with a very generous proposal to launch the project on a bigger scale, the fact that the group was not incorporated prevented the founders from even seriously considering the offer (incorporation, even as a nonprofit, was apparently out of the question).

Contrary to other early community networks, the motives of Consume.net and the other similar initiatives to which it was connected were political from the start. And there was at least one common adversary: the incumbent operator British Telecom (BT). Consume.net. For them, the Internet was democratizing access to communications in ways never seen before, but all these promises were being held back because of the market structure of the telecom markets where the monopoly of BT on last-mile networks stifled competition. There were alternative commercial Internet access providers, but there were dependent on BT's infrastructure. BT's pricing model was still based on per-minute billing, which meant that it had no incentive to invest in faster speeds, and in particular in the development of ADSL. Quite clearly, slower speeds meant more time loading web pages and sharing files, which meant more money for the incumbent.

Against this backdrop, Consume.net was about "defining a sustainable network development" by circumventing BT's last mile copper infrastructure. The state aims was therefore to build WiFi radio links to "optimize infrastructural expenditure" and "increase network speed." Eventually, by recruiting enough participants, Consume.net would come to represent significant traffic and become large enough to exchange traffic on fairer terms with other networks, therefore "reducing

connectivity costs” for all participants.

Stevens explains that around that time, BT even lobbied to extend the 1984 rule regulating the deployment of wired infrastructure across the public realm to wireless transmission. This led Consume and other free networks activists to work with Campaign for Unmetered Telecommunications (CUT). Founded in 1998, this pressure group was advocating against the per-minute billing model which was still dominant in Europe at the end of the 1990s, and boasted 300 members as well as several corporate supporters like AOL, UK and Intel.

In June 1999, they had taken part in a EU-wide 24-hour-long boycott of the Web. The organizers called for the introduction of the flat-rate schemes for local calls – which was by then the dominant model in the U.S. and played a significant role in the take up on Internet connectivity and the development of online services. According to them, Internet users [should] dial up to Internet Service Providers using a telephone modem, without worrying about the clock ticking and charges ratcheting up.” Looking forward, they also asked for the “quicker introduction of modern access methods such as xDSL, cable modems and satellite access, which do not use the telephone modem and are a great improvement on it for users.” Their campaign had been effective in accelerating the spread of flat-rate schemes. Before CUT dissolved in 2001, one of their last stunt was to help Consume activists fight BT to reach out to policy-makers and telecom regulators to ensure that WiFi sharing would remain legal for citizens (Ziya, 1999).

These contacts were successful to the extent that wireless CNs were not outlawed or suffered new regulatory restrictions. It created a contact channel between Consume's activists and policy-makers. In rural areas where proper infrastructure was crucially lacking, local groups replicating the Consume model also negotiated with local city councils.

1.3 Consume.net's Legacy and Internationalization

The Consume.net experiments, and many other similar initiatives, slowly ended in the course of 2003, as the main organizers' changing interests pushed them to move on to other projects. Some launched commercial ventures around WiFi (looking back, Stevens speaks of the “self co-optation” of his fellow free networkers). Others joined other civil society groups keen on pushing the Blair government to deliver on its promise to bring broadband access to towns and villages across the U.K., and in 2003 started the Access to Broadband Campaign with people from CUT. Others started spin-offs like Community Wireless Network, a group of community organizations teaming up with small local access providers to resolve connectivity issues in rural areas.

Today, the British landscape for community networks has lost much of its vivacity. In part, it is due to the fact that it is the very idea of grassroots open WiFi that has been co-opted by big players, for instance with BT's Openzone network of WiFi hotspots, or more simply out-competed by the development of triple-play offers and high-speed mobile connectivity with 3G and 4G, which have created the incentives for people to pay for individual subscriptions rather than cooperating to share their gateaways to the Internet.

Interestingly, it is beyond British borders that Consume's legacy is the most enduring. Two of the most dynamic and large-scale community network in the world are Freifunk and Guifi, in Germany and Spain respectively. Their outbreak in the early and mid-2000s was directly influenced by

Consume. In 2002, Consume people and their connections in Berlin organized the BerLon conference, bringing together people from Consume and local Berlin groups interested in WiFi technologies. “BerLon provided the contact zone between Berlin and London,” says Medosch (2014), who took part in the event. “This set into motion a process which would eventually lead to a large and successful community network movement.” BerLon marked the birth of Freifunk which todays boasts around 45,000 open access points across Germany. Later still, this nascent transnational network of WiFi activists helped Guifi's founders put up their first wireless nodes in rural Catalonia.

3. Conclusion: Reflecting on the First Generation of Community Networks

In this conclusive section, we aim to draw lessons on the first generation of community networks by comparing FDN and Consume.net. We address recurring themes in the history of alternative networks, namely the diversity of motivations and pricing models, the issue of geographic scope with the challenge of scaling from the local to the global, and finally the importance of political advocacy as a core component of the sustainability of CNs.

3.1 Diversity of Motivations and Pricing Models

Like with other alternative networks across history, one of the first striking observation is the diversity of model in Internet community networks. In this respect, there is nothing new. On the one hand, we find FDN, founded by IT specialists and computer experts coming out of middle class families and – for some of them at least – educated in France’s top elite engineering schools. During FDN’s founding years, its core volunteers are all white and males, whose motivation was to run their own ISP when no other existed and reduce the price of joining this new online world. They would go on to pursue their careers in the booming tech sector, and for some of them at least, in some of its most infamous multinationals. Though it apparently did not boast great ethnic and cultural diversity, Consume.net had a much more alternative ethos: It was founded by counter-cultural artists whose understanding of decentralization and flat organizational structures matched the possibilities offered by new radio technologies at the turn of the second millennium.

The techno-legal governance of both organizations reflects these differences in motivations and ideologies. FDN had to rely on the leased landline infrastructures of major telecom operators and never developed an interest in WiFi technologies (to the difference of other, more recent French community networks), and would even pioneer flat-rate pricing models which would later be adopted by major market actors. It was incorporated as a non-profit under the French law on the freedom of association and, when doing so was possible, it favored the possibility of being legally recognized as a Internet access provider by regulatory authorities. The market and regulatory constraints drove its growing politicization. Consume.net on the other hand, was very political from the beginning and sought to use the spectrum commons to bypass almost entirely market actors. It had no bylaws and no pricing scheme: It was based on an almost anarchic ethos whereby people

would freely contribute bandwidth and equipment. Here, it seems that market and regulatory constraints drew a lot of energy from the group, which seem to have play a role in what Stevens (2016) calls the "self co-optation" of its most active participants, rather than sharpening their collective political engagement. Thankfully, despite fundamental differences, both models have had enduring legacies.

3.2 The Stake of Networking Costs, From the Local to the Global

Another striking difference between these two early CNs is their difference of focus in scale and geographic reach. FDN essentially started as an effort of mutualization aimed at lowering the cost of accessing traffic originated in the US. From the beginning, relying on the national infrastructures of incumbent operators (at first the telephone network), it was – and still is – accessible on a national basis. In a way, it was a national effort aimed at bridging the gap between national legacy networks and the emerging global online world.

Consume.net, on the other hand, brought a major innovation to Internet politics by framing local Internet networks as the right level to organize a community, going against the globalizing tide. This move was in part a reaction to a context where global connectivity was increasingly affordable (thanks in part to the effort of groups like CUT), with the Internet being fast-molded into the macro-economic structures of global capitalism. At a time when the Global Justice movement was gaining traction in its opposition to neoliberal globalization, Consume.net reflected a similar criticism, seeking to embody a form of resistance to the growing commodification of the Internet by putting emphasis on locality. The irony was that such initiative was made possible by a technical innovation – WiFi – produced by regulatory decisions made by an international and corporate-friendly organization like the International Telecommunications Union, and first made available to the general public with the launch of Apple's Airport device.

Of course, Consume.net was aware of the fact that the local community networks they were building needed to be connected to the global Internet to maintain relevance. Unlike the Independents of early telephone networks in the U.S., long-distance interconnection was a given, and one which needed to be counter-balanced. Like for FDN, taking part in the global Internet was costly. Sharing costs was a way of making it more affordable, and both FDN and Consume.net understood that the more participants joined, the cheaper the community's bandwidth would be. In that respect, as noted by MacKenzie (2005), Consumet.net was also key in early attempts to "engineer the connection of local networks into extensive *ad hoc* informal meshes of wireless nodes across local and national boundaries" (p. 281). The joint effort took the form of the PicoPeering Agreement (PPA), a document first presented in 2003 which aimed to safeguard the values promoted by Consume.net and the growing movement around wireless CNs. The first version of the agreement opened on these lines:

> "*There are now many community networks, but they are separated geographically and socially and do not form a coherent network. This document is an attempt to connect those network islands by providing the minimum baseline template for a peering agreement between owners of individual network nodes – the PicoPeering Agreement.*
> *The PPA is a way of formalizing the interaction between two peers. Owners of network nodes*

assert their right of ownership by declaring their willingness to donate the free exchange of data across their networks" (PicoPeering Agreement v.1, 2003).

The PPA held the potential of creating a network of community networks that would represent "a viable and competitive supplement to the internet, but one where the system of ownership is decentralized enough for it to remain a "common," according to a volunteer involved in the project (MacKenzie, 2005). Again, though the move from theory to practice has since been somewhat disappointing, the original idea of a peering agreement that would allow local community networks to federate at the local, regional and global levels lives up to this day. As De Filippi and Tréguer write (2015), the PPA suggests "a new model for interconnection, one that blurs the distinction between the backbone and the last-mile and federates networks in a decentralized manner, extending in every direction and potentially spawning over whole countries and even across borders." Freifunk has used the PPA as its model license for federating the nodes composing its network, both at the local and regional level, but also at the national scale. Another experiment of this kind was carried on in 2012, when community networks FunkFeuer from Austria, NEDWirelles from Croatia, and Wlan Slovenija established a wireless backbone spanning across geographical borders to create a direct link between them (Musti, 2012). These experiments, pioneered in the early 2000s, show that CNs can bring innovative techno-legal answers to the challenge of bridging the local and global scale in connectivity needs.

3.3 Regulation and the Importance of Advocacy for the Sustainability of Community Networks

One last important lesson to draw from these short histories of FDN and Consume are their relationship to political institutions.

FDN approached partner public institutions like RENATER who was operating France's network for academic and research institutions. Later, the deal was severed because RENATER decided that FDN did not, in fact, qualify as an educational non-profit. The move coincided with the opening up of the country's telecom sector to market competition, which after a surge in the number of access providers led to a progressive and fast-paced recentralization of the market. FDN established loose connections with the emerging French digital rights scene in the second half of the nineties, which proved important to frame the political importance of the lone French CN and motivate some of its user to get involved in Free Software and Digital Rights advocacy efforts. However, at least until the late 2010's, FDN never really established a strong advocacy capabilities to influence increasingly hostile telecom policies to make room for alternative networks in the regulatory landscape. Although policy favoring the unbundling of last-mile networks allowed FDN to upgrade to ADSL technologies, the group played no role in pushing for such a policy and failed to organize to protect these "open access" policies in the era of fiber-to-the-home networks. It was only when a strong digital rights group emerged in France after 2009, and thanks to the launch of an actual CN movement in France from 2011 on, that FDN started getting more involved in policy discussions, both directly and indirectly (by sharing expertise with other groups), in particular around the issue of Net neutrality. Although FDN has become an important figure in the French debate on civil rights online (to the point of engaging in litigation against Internet surveillance policies, for instance), to

this day it has yet to organize a sustained and coherent political effort aimed at influencing telecom regulation.

Consume.net was political from the start, but through a form of political engagement which did not naturally push it to talk to policy-makers. The anarchist, oppositional ethos of its founders did not predispose the group to reach out to the latter. However, it was able to rely early on consumer pressure groups, like the CUT campaign, to join advocacy efforts which had direct relevance to them. A few months later, when British Telecom launched a lobbying effort aimed at outlawing the broadcast of WiFi signals across the public realm, Consume.net's volunteers had the expertise, resources and connection that helped them preempt such regulation.

Each of these two early CNs have their paradox. On the one hand, FDN offers a model of a CN whose self-understanding has become rooted in civil rights discourse and a broad political agenda around "Internet freedom" while remaining at a distance of policymaking in telecom regulation. On the other, Consume.net rejected the human rights rhetorics (today, Stevens (2016) calls this line of discourse is "American bullshit"), but --with the help of other groups-- did not shy away from campaigning on delimited telecom policy items to achieve significant change in regulations (e.g. flat-rate pricing schemes). For contemporary CNs, there may be room for a third way, a middle ground where a pragmatic discourse on human rights online can be reconciled with effective campaigning and engagement with telecom policy-makers. Freifunk seems to be a good example of such middle ground, and FDN now seems to be moving in that direction as well. The history of CNs therefore points to the importance of alliance with advocacy and pressure groups as a way of anchoring CNs in a political movement and helping them develop resource for political mobilization.

Finally, both examples suggest that one of the CNs remain highly dependent to market regulatory and business developments. FDN's rises and falls are closely linked to the (in)ability of traditional business players in the telecom market to respond to connectivity needs, or to regulatory authorities' support (or lack of thereof) for meaningful competition and diversity in telecom markets. The same goes for Consume.net, who benefited from the opening up of WiFi frequencies and helped frame the potential of WiFi to subvert part of the political economy of telecommunications. However, within a few years, it would see the idea of free WiFi hotspots co-opted by restaurants, hotel chains and telecom operators (with BT's Openzone hotspots for instance) and the "self co-optation" of those of its participants who went to to market their technical skills in the tech and telecom sectors. As De Filippi and Tréguer write, in a sector where innovation is fast-paced, "[political] motives are not in and of themselves sufficient for the network to scale up beyond a restrained community of highly engaged individuals with strong ideological values." In order to survive and grow, "these community networks must also provide a service that is considered at least as good and preferably better than that of mainstream ISPs" (2015, p. 4).

In sum, all of these challenges point to the overarching need for political organizing. Considering the collusion and corruption that plagues telecom policy, Community Networks represent an instance of "insurgent citizenship" in the online public sphere of the online public sphere – one that advances a radically-democratic agenda through the construction of alternative communications infrastructures (Tréguer, 2015), and a strategic locus for reinterpreting both ends of traditional "mediactivism" (Cardon & Granjon, 2010): the critique that aims to empower individuals and

collectives to disseminate their own voices and find way to meet their specific communicational needs by mastering the roll-out of alternative networks, and the counter-hegemonic critique that tackle structural issues, using these alternative networks as a symbolic resource to ward off the forms of domination and collusion that divert telecommunications and media policies from the public interest.

References

Bayart, B. (2016, July 15). FDN History [Face-to-face].

Cardon, D., & Granjon, F. (2010). *Médiactivistes*. Paris: Les Presses de Sciences Po.

Coleman, G. (2005). Indymedia's Independence: From Activist Media to Free Software. *Multitudes*, *21*(2), 41–48.

Chemla, L., & Bayart, B. (2016, July 14). Internet activism in France in the 1990's [Face-to-face].

De Filippi, P., & Tréguer, F. (2015). Expanding the Internet Commons: The Subversive Potential of Wireless Community Networks. *Journal of Peer Production*, (6). Retrieved from http://peerproduction.net/issues/issue-6-disruption-and-the-law/peer-reviewed-articles/expanding-the-internet-commons-the-subversive-potential-of-wireless-community-networks/

Garrett, M. (2006, March 3). Revisiting Backspace. Retrieved 2 November 2016, from http://www.furtherfield.org/reviews/revisiting-backspace

Gerich, E. (1992). Guidelines for Management of IP Address Space. Retrieved from https://www.rfc-editor.org/rfc/rfc1366.txt

Gonzalez, A., & Jouve, E. (2002). Minitel : histoire du réseau télématique français. *Flux*, *n° 47*(1), 84–89.

Granjon, F., & Torres, A. (2012). R@S : la naissance d'un acteur majeur de l'« Internet militant » français. *Le Temps Des Médias*, *18*(1), 87. https://doi.org/10.3917/tdm.018.0087

Hammersley, B. (2002, June 20). Start a Wi-Fi revolution in your street. *The Guardian*. Retrieved from https://www.theguardian.com/technology/2002/jun/20/news.onlinesupplement1

Heikkila, P. (2002, November 29). WiFi activists on free Web crusade. Retrieved 2 November 2016, from http://edition.cnn.com/2002/TECH/11/21/yourtech.wifis/

MacKenzie, A. (2005). Untangling the Unwired Wi-Fi and the Cultural Inversion of Infrastructure. *Space and Culture*, *8*(3), 269–285. https://doi.org/10.1177/1206331205277464

Medosch, A. (2015). *The Rise of the Network Commons*. Retrieved from http://www.thenextlayer.org/NetworkCommons

Michalis, M., & Ruhle, E. O. (2001). Local access competition and local loop unbundling. *Multimedia Und Recht*, *4*(1), 23–32.

Milan, S. (2013). *Social Movements and Their Technologies: Wiring Social Change*. Basingstoke: Palgrave Macmillan.

Mortleman, J. (2002, April 18). Hit the open node. *The Guardian*. Retrieved from https://www.theguardian.com/technology/2002/apr/18/internetnews.onlinesupplement3

Musti. (2012, October 10). We are internationally wireless! Retrieved 17 November 2016, from https://wlan-si.net/en/blog/2012/10/10/we-are-internationally-wireless/

Nicaise, J.-P. (2016, October 27). FDN History [Telephone].

Paloque-Berges, C. (2015). When institutions meet the Web: advocating for a 'critical Internet user' figure in the 1990s. Retrieved from https://halshs.archives-ouvertes.fr/halshs-01245511/document

Papatheorodou, A. (2005). Samizdat.net, l'histoire d'un projet de médias alternatifs sur Internet. Entretien avec Aris Papatheorodou. *Matériaux pour l'histoire de notre temps*, *79*(1), 57–62. https://doi.org/10.3406/mat.2005.1043

Paulus, C. (2016, October 19). FDN History [Telephone].

Picopeering Agreement v1.0. (2003). Retrieved 16 November 2016, from https://archive.is/v1ozC

Priest, J. (2000, July 25). consume the net. Retrieved 2 November 2016, from http://dek.spc.org/julian/consume/consume.html

Priest, J. (n.d.). *A brief history of Consume*. Retrieved from http://informal.org.uk/people/julian/resources/consume/history/slide_05-06.html

Rebillard, F. (2012). La genèse de l'offre commerciale grand public en France (1995-1996) : entre fourniture d'accès à l'Internet et services en ligne « propriétaires ». *Le Temps Des Médias*, *18*(1), 65. https://doi.org/10.3917/tdm.018.0065

Schafer, V., & Tuy, B. (2013). *Dans les coulisses de l'Internet. RENATER, 20 ans de technologie, d'enseignement et de recherche*. Paris: Armand Colin.

Stevens, J. 2016. Consume.net History. [Face-to-face].

Terranova, T., & Donovan, J. (2013). Occupy social networks: The paradoxes of corporate social media for networked social movements. In G. Lovink & M. Rasch (Eds.), *Unlike Us Reader: Social Media Monopolies and Their Alternatives* (pp. 296–311). Amsterdam: Institute of Network Cultures.

Thierry, B. (2012). « Révolution 0.1 ». Utilisateurs et communautés d'utilisateurs au premier âge de l'informatique personnelle et des réseaux grand public (1978-1990). *Le Temps des médias*, *n° 18*(1), 54–64.

Tréguer, F. (2015). Hackers vs States: Subversion, Repression and Resistance in the Online Public Sphere. *Droit et Société*, *N° 91*(3), 639–652.

Uldam, J., & Askanius, T. (n.d.). Online social media for radical politics: climate change activism on YouTube. *International Journal of Electronic Governance*, *4*, 69–84.

Ziya, E. (1999, April 21). Fifteen Countries Participate in Coordinated European Telecommunications Boycott. Retrieved 3 November 2016, from http://www.unmetered.org.uk/press/pr210499.txt