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"The Roof is on Fire:
Ethnographic Fieldwork in the Wireless Community Network 'FunkFeuer Wien'"

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1) Introduction

"There was a time when people felt the Internet was another world,
but now people realize it's a tool that we use in this world."
Tim Berners-Lee

1.1) Research interest

When I first heard about the Wireless Community Network (WCN) "FunkFeuer Wien" on a TV-documentary back in 2013, I immediately decided to visit the organization. Quite quickly the idea formed to make the organization the topic of my bachelor's thesis. Fortunately, the members of FunkFeuer (FF) were open to talking to me and provided great field access and insight into all the processes that are accessible to active members. The main focus of my bachelor's research was to question the motivations and to understand why people join and participate in such an organization. Discussion of the results has shown that nearly all members have very different motivations, but there is still a common denominator: fascination for technology and the fun of "do-it-yourself." After spending more than four months within the organization, I not only had many new and unanswered questions, but also an abundance of collected data. This led me to write my master's thesis on FF. I continued to read literature and news on topics related to Media Anthropology, Internet and technology in general. The popularity of Internet related topics has continuously grown over the course of my studies, especially due to revelations by Edward Snowden in 2013. Some Information and Communication Technology (ICT) experts have stated that only by creating one's own infrastructure is it possible to avoid surveillance or become at least independent from commercial Internet Service Providers (ISP). The popularity of dystopian scenarios in books, films, discussions, documentaries, etc. in today's world has continued to grow. In 2014, the topic was even at the center of Hollywood when *Citizenfour*, a documentary on Edward Snowden's life, his revelations and the consequences, received the honor of an Oscar award. I also noticed that people were trying to find alternatives such as using Free Software (FS), going to so-called CryptoParties, joining events on Internet politics, or trying to participate in the FF network.

All these developments led me to rethink my impressions of FF, to look at previous held opinions in a new way, and to raise new questions. Is FF really an alternative? Is the organization's popularity growing? What do FF members think of these developments? Have members noticed any differences since popularity has grown? In order to be able to answer these questions I have stayed up-to-date on all news concerning FF. I read articles in newspapers, and followed mailing lists, Twitter and Facebook accounts with the aim of not

losing my already gained field access.

To study FF meant not only talking with members, but also informing oneself of all ongoing debates related to net politics. I had been aware of the importance of being up-to-date already when doing ethnographic fieldwork for my bachelor's thesis. It is much easier to start a conversation when one is informed of topic related technological aspects. As a result, I attended many events, meetings and parties, which gave me not only a more profound understanding of WCN, but also hacker culture in general. I have realized that I could not conduct research on FF separately or without mentioning all the compelling aspects of hacker culture. Hence, I see my research topic not only as WCN and/or FF, but also all the diverse facets of hacker culture.

1.2) Research question(s)

All such preparations and thoughts have led to the following main research question:

In which ways are certain media technologies used to manifest personal beliefs and values in the Wireless Community Network "FunkFeuer Wien"?

Further, sub-questions provide the opportunity to look at FF from different angles. These questions are as follows:

What role does the sharing processes of Internet access play in the collective construction of an idea of independence?
In which way is the pursuit of building a nonhierarchical association a central interest to the participants?
How are existing anthropological concepts and discussions of hackers and/or tricksters applicable to FunkFeuer when analyzing the intra-organizational power relations and actions of participants?

FF is a network of very diverse members with many ongoing debates and vivid discussions. Nevertheless, it is extremely important to focus on various principles or ideas followed within the organization in order to discuss members' personal beliefs and values. Such terms as *personal beliefs* and *values* were chosen to avoid any relations to politics or other ambiguous terms.

1.3) Methods

For a long time ethnographic fieldwork used classic media such as scripts, images or numbers for data collection and data analysis. The media technological superiority of the researcher towards his or her informants soon led to academic debates on *media divide.* Anthropologists have debated on topics such as orality and literacy, and reflected their *bias* during fieldwork, e.g. in the highly influential *writing culture* debate. Particularly the connection between writing and power relations has further increased anthropological interest in studying media. Colonization and global spread of writing has however not erased speech. In fact, writing and speech have become more combined even in such areas where literacy seems to be rejected. The growth of new media technologies has further expanded methods for data collection as well as self-representations of informants (Bender & Zillinger 2015: xvii-xviii).

Ethnographic media research is characterized by the scrutinizing of media and media practices in social and cultural contexts. It follows changes of perspectives of media practices in small sections without losing focus on details. It is a step-by-step heuristic approach in order to become familiar with various links of social and technical networks. An ethnographer becomes involved in different media practices and grasps them by following the actors or certain local practices. The relation between local and global becomes clear when localities circulate – in the broadest sense – humans, signs, and things. Methods of media ethnography subsequently allow for the studying of globalization processes by focusing on these intertwined oppositions (Bender & Zillinger 2015: xxviii-xxix). Embedding in local contexts means voluntary or involuntary networking with global contexts. Anthropologists previously believed that local contexts or *foreign* cultures were independent or isolated. This view led to *othering* and *exotization.* Nowadays they strongly emphasize supra-regional aspects of these local contexts (Gingrich 2011: 232). Arjun Appadurai (1990; 1996) has presented concepts such as *global cultural flows* or *scapes* (that includes ethno-, media-, techno, finance-, or ideoscapes) in order to analyze global cultural dynamics from an anthropological perspective.

Furthermore, conducting media ethnography means not simplifying complexities, but presenting and understanding human life or a field of study in these complexities. Situations from everyday lives have shown, e.g. the important role of mass media for its consumers. Media ethnography follows the idea of a thickly contextual mode of detailed description with reflexive discussions of collected data. Observing and recording human actions as they happen opens doors for further critical encounters with people in different mundane situations. By participating in intimate situations and engaging with people at their workplaces, homes, etc. it becomes possible to learn *from* the hosts and not simply about them

(Peterson 2003: 8-9). This fact was especially apparent when I was learning about the various kinds of media technology uses from FF members. I was even able to apply the knowledge I gained to my own life. However, some of these strategies were only possible to apply while performing in the organization.

Thus cell phones, mussels, newspapers or necklets are objects that incorporate a certain meaning among people as well as implied social relationships when using them. When studying mass media, anthropologists should particularly accentuate production, circulation and reception of media in order to investigate its actual effect by applying methods of media ethnography (Shipley 2011: 236-238).

Ethnographic research for the current study began in November 2015 and lasted until May 2016, and was based on the following methods:

Participant observation

The core method of ethnographic fieldwork is participant observation. This method has given me the ability to participate in the many activities of FF. First, FF has weekly Monday meetings starting at 7 pm in the so-called hacker space "metalab." These meetings offer a platform for discussion, the opportunity to solve any problems, and simply create space for hanging out, talking, tinkering, installing, and drinking with each other. It is a great opportunity to stay up-to-date with news and activities of the organization, and the computer world and politics in general. I even bought an old cheap Lenovo Thinkpad T61 in order to participate in the tinkering and/or programming activities that take place during the meetings. I have found it very easy to start chatting with other participants by, e.g. installing diverse Linux distributions.

In addition, I used these weekly meetings to make new acquaintances, and talk in detail about various issues, which I perhaps did not fully understand during other meetings or activities. Furthermore, it was a great chance to conduct and record interviews since the metalab location is rather quiet and participants are not in a hurry. There is no assigned time for closing the hacker space, so it was not unusual for me to talk or conduct an interview with someone late into the night.

Secondly, FF organizes many different activities besides the weekly Monday meetings and I used these additional opportunities to conduct further participant observations. Examples of such activities including installing antennas on rooftops in Vienna, servicing already existing nodes, maintaining the colocation center, repairing broken down Internet connections or simply discovering new areas for network expansion. It was problematic to

record interviews during these activities because it was loud and I also did not want to disturb the working process. Thus I mostly took part in informal talks during these activities. Following H. Russell Bernard's Research Methods in Anthropology, I implemented participant observation during these activities in order to get closer to FF's members and make them feel comfortable enough with my presence so that I could observe and record information about their everyday practices (Bernard 2006: 342). It is a mix between active participation and complete participation (DeWalt & DeWalt 1998: 262-263).

I tried to engage actively in almost everything that FF's people were doing in order to learn the cultural rules of behavior. On the one hand, I was in a way a complete participant in that I registered in the organization as a full member in order to follow the mailing list and attend meetings which are closed to non FF members; yet on the other hand I was not truly a complete participant since I did not use FF's network for Internet access and did not have my own node. I assume this mix of both types of participant observation strategies gave me the perfect opportunity to get as close as possible to members, but still maintain a critical distance to the organization. Another significant reason for not becoming a full member of FF was my time schedule for completing this master's thesis. It took a lot of time to become familiar with diverse routers and specific settings for FF software, to obtain property management's permission to install antennas on the rooftop, etc. Nevertheless, I collected information from the user's perspective in order to understand the nuances of setting up an own FF node and probably even more important, the usage of it afterwards.

Interviews

Interviews were absolutely an essential part of my ethnography. Following Bernard's path from informal to unstructured to semistructured interviews, I have mixed all these strategies in order to reach different goals (Bernard 2006: 221). Whereas I mostly conducted semistructured interviews when talking with experts, I used informal and unstructured formats for connecting with new conversational partners or when I needed to ask "uncomfortable" questions. Moreover, I used informal interviews for uncovering new problems or potentially overlooked topics of interest (Bernard 2006: 211). I documented thoughts and memories as field notes either immediately after a conversation or when I arrived home. Sometimes when I spent a great amount of time in the field and lost distance, I asked for an unstructured interview.

According to Bernard (2006: 212), unstructured interviews are especially suited for cases where the researcher has a lot of time. As I mentioned before, metalab is a place where

hackers and/or FF members hang around and spend a lot of time with each other. By doing unstructured interviews, I followed the idea of having a platform that allows individuals to open up and express themselves on their own terms. This type of ethnographic interviewing has led me to long and productive interviews and group discussions, which in turn brought new thoughts, perceptions and questions to the research process. Lastly, I held semistructured interviews with experts and individuals I probably would not have another chance to interview (Bernard 2006: 212).

This type of interview fit for Aaron Kaplan, the co-founder of FF. Since he was never at FF meetings due to time restrictions, I had to make an extra appointment with him for an interview. This type of interview gave me the possibility to concentrate on the main aspects I wanted to ask about but still offered him free space for new leads. I also held another semistructured interview with Thomas Lohninger, the famous net neutrality activist (in Europe and Austria in particularly). It was even more difficult to find time to interview him because he gives many speeches, talks and presentations in various cities throughout Europe. By using this type of interview, efficiency is gained, and I was able to show the interviewee respect by considering his time capacities and demonstrating reliable preparation for the interview.

Field notes

The aforementioned field notes certainly play a significant role in my research. Not only are such notes the best way to write down thoughts, quotes, memories, etc. without the fear of forgetting something, but it is also extremely useful to afterwards retype, organize and rethink the notes on the computer.

So, by using the term field notes I mostly followed Bernard's four types of notes in fieldwork: jottings, a diary, a log, and field notes (Bernard 2006: 389). The jottings and/or so-called scratch notes are any notes that came to mind throughout the day. Following the popular slogan "if you don't write it down, it's gone", I tried to write as many notes down as possible. From time to time, I had conversational partners do drawings when explaining complex mechanics. I often had to improvise with the jottings in the notebook and sometimes simply wrote down names, recommendations, book or film titles, and specific technological terms or software advice. A log helped me to keep an eye on the time schedule and provided ideas on how to proceed further.

Separately to jottings, the log, and field notes, I kept a field diary, where I wrote personal thoughts and feelings about the conversational partners, observations and the whole

research process in general. During data analysis, the diary helped me to interpret field notes and made me aware of my personal biases (Bernard 2006: 391).

In addition, I documented many activities of FF by taking photos and videos. Photos are an excellent way to demonstrate the process of tinkering on any technological devices, to document the building of nodes and antennas, to record various pranks or simply take pictures of amazing views from the rooftops.

Data Analysis

I began to develop categories of *personal beliefs and values* and *use of media technologies* after spending some time doing ethnographic fieldwork at FF. Members brought up most of these categories during informal conversations, interviews and group discussions. It was an *iterative process* that has mostly taken its steps from grounded theory (Glaser & Strauss 1967; Corbin & Strauss 1998). Transcripts of interviews and field notes were used for identifying upcoming analytic categories and potential themes that arose. It was possible to link certain categories by pulling the data together and comparing afterwards. The close relations between some categories are illustrated in the empirical part of the thesis. Analyzed data is presented under chapters that follow the idea of categories and quotes from interviews. These quotes are called exemplars and are used to highlight the theory.[2] This strategy opened up the possibility to develop new research directions, especially by keeping notes on coding and potential hypotheses (Bernard 2006: 492). When at the beginning of the ethnographic fieldwork the questions were formulated in a quite broad and open way, as time when on the questions became narrow and more specific due to parallel process of data analysis and data collections. I have used the data material to develop new questions and reformulate old ones so as to avoid any misunderstandings during the writing process. The last visits were mostly used to ask extremely quick and specific questions.

Analyzing of field notes included analytic reading, asking questions about such notes as well as coding and memoing. It was a procedure that involved constantly refreshing my take on the field notes as a data set, re-experiencing and re-examining all the information that was written down, and searching for certain themes, patterns and variations. Additionally, the ethnographer obtains new insights and perspectives by reviewing the complete data set, and recognizes the contrast between first impressions and later understanding of various processes. Some initial interpretations of actions, behaviors or talks may even appear naïve

[2] I have translated most of the interviews from German to English, however some interviews e.g. with Thomas Lohninger were conducted in English from the beginning.

and erroneous when analyzing them as a corpus of field notes at the late stages of research (Emerson et al. 1995:144-145).

Questioning of field notes was one of the significant procedures of data analysis in order to develop interpretations or analytic themes, to reflect sensitivity to practical concerns, and to put specific focus on members' descriptions and classifications of themselves, without concentrating too much on aspects that the ethnographer might grasp as meaningful and important (Emerson et al. 1995:147).

1.4) Structure

Division into two parts – the theoretical and empirical – defines the structure of the current study. The thesis starts with a presentation of theoretical perspectives on the research topic, and the main focus is framed by theories of Media Anthropology. This part provides definitions and discussions of fundamental terms of the work such as media technologies, material culture, cyberspace, Internet, virtuality, or reality from different angles. It further provides an introduction and overview of developments in the hacker scene and FS communities, and illustrates the main aspects of anthropological approaches to media technologies. The theoretical part presents several ethnographies, which have been conducted on topics related to media technologies, and connects them to the FF case. Besides that, the background and history of FF is illustrated and the concepts and structures of WCNs in general are introduced.

The empirical part discusses the main research question and the sub-questions by portraying personal beliefs and values of the members and their certain ways of using media technologies. There is a chapter designated to each personal belief and value, which not only shows the complex and multilayered notions of each category, but also specific activities related to them. All six chapters are built upon one another, although none should be prioritized over the other. The same applies for the two categories of the following chapter, which deals with uses of media technologies explicitly in the FF case. The study concludes with a discussion of the results and finally leads to a conclusion.

2) Media technologies and Anthropology

2.1) Media technologies as material culture

For the most part, the following study positions itself in the theoretical perspectives of Media Anthropology, a subfield within Social and Cultural Anthropology. In contrast to other researchers, anthropologists have discovered this terrain of digital media relatively late (Postill 2009: 334). Nevertheless, it has quickly become clear that Anthropology can provide a profound method toolkit from ethnographic fieldwork and theoretical perspectives used to study modern technological developments. In using the term digital media, I am referring to Gabriella Coleman's discussion of this term in her article *Ethnographic Approaches to Digital Media,* and encompassing a wide range of nonanalog technologies, such as cell phones, antennas, routers, the Internet, and software applications that power and run on the Internet (Coleman 2010: 488).

From the very beginning of Anthropology as a subject, anthropologists have been interested in focusing on technology. At this point in time authors such as August Pitt-Rivers or Lewis Henry Morgan ranked levels of evolution by investigating technological sophistications (Morris 2012: 250). From today's point of view, "technology can be defined as the particular domain of human activity immediately aimed at action on matter" (Lemmonier 2002: 818). Thus conducting anthropological research on digital media means "placing attention on the material and ideological functions produced and sustained by digital technologies." (Coleman 2010: 495). To study and understand social and cultural impacts of digital media, one must especially take its materiality into account. The well-functioning infrastructure of digital media enables the circulation of information and makes the working of innumerable Internet services possible (Coleman 2010: 491). This specific perspective emphasizes not only the meaningfulness of physicality for the existence of the Internet and discusses it in the anthropological sense of material culture, but also aims to grasp what people actually do with digital media. Long-term ethnographic fieldwork thereby offers insight into mundane and everyday uses of digital media and helps to spot possible varieties in usage.

Unlike other subjects dealing with media, Media Anthropology is firmly anchored within the aforementioned qualitative methods that are especially helpful to understand everyday behavior. The tremendously fast development of ICT's can often and easily lead to losing oneself in only one question (for example, "How-does-it-work on the technical level?") instead of focusing on the more important part: the feasibility of inserting and adapting media technologies into different environments (Lemmonier 2002: 821). Moreover, Raymond

Williams' illustrations on *the Technology and the Society* demonstrate the significance of asking proper questions during the research process.

> "It is often said that television has altered our world. In the same way, people often speak of a new world, a new society, a new phase of history, (…). Most of us know what is generally implied when such things are said. But this may be the central difficulty: that we have got so used to statements of this general kind, in our most ordinary discussions, that we can fail to realize their specific meanings." (Williams 2002: 27).

The theoretical approach to media technologies as material culture motivates us to rethink these ordinary meanings as well as scrutinize the often forgotten link between on and offline worlds. Mike Morris summarizes the various definitions of material culture as "the artefacts – tools, household items, clothing, through to art, religious objects, and architecture – considered as evidence of the culture that produced them." (Morris 2012: 161). Although Media Anthropology has a close relationship and cooperation with other scientific disciplines, it still uses common anthropological theories and concepts for analyzing modern technologies and phenomena. Some are theories on ritual, ritualization or mythologisation, others focus on the many different approaches to processes of giving and sharing, and several concentrate on thoughts of identity constructions or material culture. Further, Anthropology does not speak of media only in the sense of content or certain messages. On the one hand, it of course attempts to look at various media phenomena; on the other hand, it analyzes the circumstances, contexts, production and distribution of media with a precise view of technical aspects. (Budka 2013: 2). This is why it makes most sense for the following thesis to use the term *media technologies* and not simply *media* and/or even *digital media* in order to emphasize technological aspects that are extremely relevant for discussing the main research question of this work.

> "The 'ethnography of media,' as a category of media studies, involved decentering the textual content of media technologies in favor of analyzing the social context of their reception. Refiguring the ethnography of media necessitates a further expansion by taking into consideration the physical and sensory properties of the technologies themselves and examining the materiality of communication across cultures." (Ginsburg et al. 2002: 19).

However, when speaking of technology as material culture, one should not simply follow the idea of technological determinism. Nowadays, social influences in technology are well accepted (Eglash 2006: 338). Thus instead of concentrating on the so-called "effects" of media technology "on" people, Media Anthropology aims "to expose the agents, aesthetics, politics, and economics behind the technologies." (Askew 2002: 2). Since today's world offers a great variety of countless devices that people are using in everyday life, researchers cannot grasp all in just one single work. Hence anthropologists often place focus on only certain media technologies in order to avoid loosing overview of the particular study.

Whereas FF's main technological components consist of antennas, routers and cables, anthropologists such as Daniel Miller and Heather Horst conducted one of most famous studies on a form of media technology: the cell phone.

In their ethnography titled *The Cell Phone. An Anthropology of Communication*, the authors discuss the appropriation of cell phones in Jamaica. The authors followed the ways in which low-income Jamaicans have integrated cell phones into their lives and how they have become completely ordinary things in people's everyday routines. Those without cell phones are even considered as "deficient" (Horst & Miller 2006: 2). Cell phones still remain something individual and representative of personal style. Even gender diversity can be seen in the decorating and/or wearing of these digital devices.

> "A more feminine practice involved wearing the phone in the back pocket of tight pants, particularly low hip-hugger jeans. (...) Fashion-conscious women generally preferred to have something like a small pink clamshell design that looked feminine or sexy. Other women make more of changeable fascias." (Horst & Miller 2006: 61).

In fact, certain models of cell phones are considered to be more feminine or masculine. This specific anthropological perspective on media technologies as material culture enables my ethnography to not only scrutinize the physical infrastructure as the essential element of FF's network, but also to take a look at how materiality produces virtuality.

> "From the infrastructure behind computers to that behind finance, games, design or museum catalogues, we seem less and less aware of how our environment is materially structured and what creates us as human beings" (Horst & Miller 2012: 28).

FF has a strong online presence and actively uses mailing lists, social media, their website and even their own wiki to communicate ideas. And although the following ethnographic fieldwork is not conducted in so-called virtual worlds or cyberspace, it is still important to briefly discuss the common juxtaposition of reality against virtuality. In short, Anthropology tries to dissolve this common dichotomy. As Tom Boellstorff argues, anthropologists should not privilege the *real* world over the *virtual* because "virtual worlds are places of imagination that encompass practices of play, performance, creativity, and ritual. The social lifeworlds that emerge within them are very real" (Boellstorff 2012: 1). Even the term *material culture* itself shows this complex relationship between the physical and intellectual world since "material" is opposed to "cultural." By studying the material dimension, the researchers aim to understand culture in the same way as if they were to put focus on language, social relations, space, time or the relations on productions, exchange and consumption. (Tilley 2006: 1). In today's world, studies on material culture have become more and more diverse. Since media technologies dominate the everyday life of a great amount of people,

anthropology also tries to discuss modern media phenomena.

When conducting studies in online environments, terms such as cyberspace are becoming an inflationary trend. The author William Gibson created this popular term in his short story "Burning Chrome" written in the cyberpunk genre in 1982. Kolko et al. define cyberspace "as an environment comprised entirely of 0's and 1's: simple binary switches that are either off or on. No on-between. No halfway. No shades of gray." (Kolko et al. 2000: 1). This term is surely very complex and has of course a lot of other definitions and own understandings in diverse scientific disciplines. Perhaps the most common is to consider the expression with all forms of computer-mediated communications or anything associated with the Internet or the diverse Internet culture (Nunes 2006: 46).

However, the "virtuality" aspect is not a creation of our time. It can be seen in cave paintings, the development of writing, the printing press and among Aboriginal cultures throughout the world. Of course such notions "have been further shaped by the rise of electronic mass media, as well as work in cybernetics and computing." (Boellstorff et al. 2012: 22).

One of the first ethnographic approaches to the Internet was Christine Hine's book "Virtual Ethnography". She considers the Internet as culture and a cultural artifact (Hine 2000: 14). Daniel Miller and Heather A. Horst further elaborate on the notion of the Internet and any other media technologies as material culture in their anthology *Digital Anthropology*.

> "The key to digital anthropology, and perhaps to the future of anthropology itself is, in part, the study of how things become rapidly mundane. What we experience is not a technology per. se., but also an immediately a cultural inflected genre of usage." (Miller & Horst 2012: 29).

Besides this social and cultural anthropological theoretical concept for looking at media technologies in the sense of the genre of usage, Tom Boellstorff et al. published in 2012 a handbook of methods for conducting ethnography in virtual worlds. For anthropologists the foremost method for studying virtual worlds remains as ethnographic fieldwork with participant observation (Boellstorff et al. 2012: 65). Core focus is again directed to everyday and mundane activities. Although Boellstorff advances a view that "actual-world sociality cannot explain virtual-world sociality" (Boellstorff 2008: 63) one should not forget that there is no need to think in dichotomies. One of the main principles of Digital Anthropology

> "suggests that humanity is not one iota more mediated by the rise of the digital. Rather, we suggest that digital anthropology will progress to the degree that the digital enables us to understand and exposes the framed nature of analogue or pre-digital life as culture and fails when we fall victim to a broader and romanticized discourse that presupposes a greater authenticity or reality to the pre-digital." (Miller & Horst: 2012: 4).

This principle is extremely important for discussing media technologies as material culture since it allows researchers not only the opportunity to "understand what it means to be human" (Horst & Miller 2012: 4), but also to deconstruct the common idea that the analogue-way of life is more real and/or even authentic than the pre-digital. Thus, today humanity can be described as differently mediated, but by no account more mediated. The disbelief in "the Internet" is what distinguishes anthropologists from other scholars who study online environments. Daniel Miller calls the ethnographic approach to media technologies as holistic contextualization. To look at a population's online activities in combination with *who they are* and *what they do* is the crucial aspect for emphasizing the actual world. Since no one lives just online, there is always a connection to the offline. Without fetishizing the Internet, online today is simply one place in which people live and conduct relationships with others. To exemplify this fact, one does not ask "what is your relationship in the real world" after a telephone conversation. Further, the notion of the Internet varies throughout time. While at the beginning the debate focused on how a user's identity on the Internet had no way of being verified, resulting in an extremely anonymous space, current debates are by contrast all about a lack of privacy and transparency. Thus, the same platform can easily be changed by different beliefs, values or genre of usage.

> "I don't suppose that this perspective is hugely provocative to anthropologists. (…) Step outside anthropology for a while, and you soon see how unwelcome and disputed our anthropological perspective has become in a world seemingly sure that, eventually, a natural science model will predict the interactions between humanity and technology. Consider, here, the fashion for big data. Anthropology's main need right now is to shout louder and to insist on being heard. Believe me, we are provocative." (Miller 2016).

George Marcus further agrees that virtual worlds are nowadays no longer virtual in the sense of imaginations, and instead are now accessible to us as actual "real" life for ethnographic studies. The handbook of methods makes these virtual worlds as accessible as physical worlds to the application of ethnographic methods (Marcus 2012: xvii).

The link between actual and virtual can further be demonstrated with the case study of the Moluccan conflict, which was conducted by the anthropologist Birgit Bräuchler between 1999 and 2002. Besides other spaces, Christians and Muslims were intensely using cyberspace to spread and/or defend religious views. By doing this it was possible for both camps to attack their opponent not only verbally, but also physically without putting oneself in danger. Some possible techniques of so-called cyberwars include various virus attacks, email bombs, spamming, DDoS attacks, crossposting and many others (Bräuchler 2005: 264). In the end, cyberwar is "the use of computer technology to disrupt the activities of a state or organization, especially the deliberate attacking of information systems for strategic or

military purposes." (URL 1). Since in this sense cyberspace becomes a resource, the classical geopolitical relationship between space and power is obvious and applicable. Thus the bisection in "our" space versus "their" space or the idea of "space matters" can still be relevant in the mediated world today (Nissel 2014: 20). During the Moluccan conflict each side implemented diverse strategies for expanding one's own "space" in cyberspace by controlling it and propagating one's own ideas within it. The vulnerability of the Internet is the material components the network is built of. Physical attacks on hardware, cables, computers, etc. not only destroy access to the Internet, but also manipulate or erase an opponent's information. By taking a look at maps depicting, e.g. submarine fiberoptic telecommunication cables, the actual palpability of created online environments becomes even clearer.

In addition, by looking at the hotly debated issues linked to digital divide, one can again see the importance of considering media technologies as material culture. Jan van Dijk gives the common definition of this term

> "as the gap between those who do and those who do not have access to computers and the Internet. Access first of all meant physical access: having a personal computer and Internet connection" (Van Dijk 2005: 1).

Hence one cannot participate in online environments without physical access to the necessary technologies. Is it the privilege of the rich or "developed" part of the world and the discrimination of poor or "underdeveloped"? Assuming that communication media transfers certain ideology, it could consequently mean that more quantitative data equals more knowledge. Thus a digital divide could only be a problem from the Eurocentric point of view because a Western-centered perspective is seen as trying to colonize other cultures through ICTs (Scheule 2004: 102). This criticism gives not only a new perspective on topics related to digital divide, but raises questions such as *are media technologies really necessary so as to not be discriminated from "normal" everyday life,* or even provokes more abstract questions such as *is the notion of discrimination socially and culturally constructed.* These theoretical questions are extremely useful since FF supports refugees with free Internet access and looks at it as a natural resource (which I will illustrate in detail later in the empirical part of this thesis).

Speaking of digital divide, many anthropologists have studied how indigenous or marginalized people use media technologies to be heard, build new networks, distribute information or even raise political issues. Various media practices provide a platform for indigenous activism or the production of films, websites, etc. The goal of these marginalized people is to use media technologies to give information that differs from content of mass or

common mainstream media. Hence indigenous groups are using media technologies not only as tools for participating in the globalized world, but also as a way to attempt to change it or at least raise a voice in opposition. Although it is not possible to become completely independent from governmental policies, it still means that having control over infrastructure provides the possibility to produce and distribute ideas according to one's own politics and policies, though it definitely requires certain know-how and technological knowledge for realizing such huge projects. For marginalized groups, a lack of such skills can mean remaining unheard (Budka 2015).

Furthermore, according to Horst and Miller it is firstly extremely advisable for anthropologists to look at the infrastructure and/or the process of obtaining access to a particular technology in order to begin the discussion of the integration of media technologies in someone's life. Even costs can play an important role in detecting certain differences when it comes to making a buying decision (Horst & Miller 2006: 19-29). The materiality of the Internet can consequently be seen by the fact that, e.g. FF's Internet access, antennas, servers, computers, hardware, etc. sometimes break down and need to be repaired by participants.
Materiality is thus the foundation of approaching media technologies from an anthropological perspective. "First, there is the materiality of digital infrastructure and technology. Second, there is the materiality of digital content, and, third, there is the materiality of digital context." (Horst & Miller 2012: 25). Or to put it another way, this approach demonstrates "how what has been termed the virtual is more a new kind of place rather than a form of placelessness." (Horst & Miller 2012: 27). Further, according to the authors, when modern technologies are producing more and more illusions of immateriality, the accentuation of the material culture perspective should play a significant role in anthropological studies. One should avoid the construction of illusion of immateriality when doing ethnographic fieldwork on media technologies. Even some activities, such as sharing – which is one of the most essential elements in hacker culture – have relations to materiality.

On the one hand, source code is an expressive medium such as writing or giving a speech, yet on the other hand it could be seen as a tool capable of performing concrete actions.

> "It is mnemonic that translates between the illegible electron-speed doings of our machines and our lingering ability to partially understand and control them as human agents." (Kelty 2008a: 118).

This specific anthropological view of digital media and/or the Internet has made an important contribution for scientists who study various technologies in general. David Hakken (1999) for instance criticizes the well-known notion "that computing has changed/is changing our

lives profoundly" (Hakken 1999: 15). Thus Social and Cultural Anthropology truly needs more empirical studies to investigate what actually happens. As Heather Horst exemplifies with the help of three case studies in her article *New Media Technologies in Everyday Life,* Anthropology has been concentrating on home and domestic spaces for a long time. By upholding this tradition, anthropologists can now examine upcoming modern digital media technologies in private households and discuss not only the contexts, but also the fact of how they become rapidly mundane. The classic anthropological ways of knowing include such concepts as "the attention to change over time, relationships and relationality and a broad sense of commitment to a site, place, people or practice." (Horst 2012: 72). Using time-tested anthropological methods like participant observation in such environments offers new insights and perspectives on modern developments without searching for completely new approaches. Media Anthropology puts research on media forward by emphasizing the mediation of communication with it social and culture or historical processes and contexts. In doing so, the analyzing of political and economical circumstances plays a crucial role in looking beyond contents and messages of media.

> "The key questions for the anthropologist are how these technologies operate to mediate human communication, and how such mediation is embedded in broader social and historical processes" (Peterson 2003: 5).

Today, Media Anthropology occupies a solid position within other subjects, and more and more studies are being conducted on these highly compelling topics. As Boellstorff argues in an interview, anthropologist should as a matter of course go where people are and yet not forget to cultivate imagination (URL 2).

> "Despite our best intentions, we often fall back on folk theories and preconceived notions from our own cultural backgrounds. This is particularly the case when speaking about the future. The problem with the future is that there is no way to research it." (Boellstorff 2012: 56).

2.2) Gabriella Coleman and hacker culture

The anthropologist Gabriella Coleman has not only published many articles related to hacker culture topics, but also two major monographs that can be used to analyze hacker movements. Her books have become relevant not only for anthropologists, but also for other disciplines who study hacker cultures in general and/or even readers without a scientific background. The Australian hacker and founder of WikiLeaks Julian Assange himself calls her *Hacker, Hoaxer, Whistleblower, Spy: The Many Faces of Anonymous* "easily the best book on Anonymous" (URL 3).

As the title of her book already suggests, digital collectives such as Anonymous have many faces and hence are not necessarily unanimous. Yet, Coleman's task was beyond motivating the field of activism. Although activists like Anonymous are far from perfect, she still thinks it is extremely useful for democracy to join imperfect activism as opposed to doing nothing or masquerading a democratic process by political inaction (Coleman 2015: 402). Nevertheless, in the very early stages of the development of hacker culture, activism was not the first priority, yet hacker humor was always present. "The targeting of people and organizations, the desecration of reputations, and the spreading of humiliating information" (Coleman 2014: 19), or so-called "trolling" was quite common in the hacker underground. The fascination in the thrill of transgression and the fun of playing with technology led underground hackers to conduct various pranks, such as phreaking, the manipulation of telephone call routing. At the same time they "acquired, circulated, and produced technical knowledge – scouting for security vulnerabilities and edifying technical curiosities." (Coleman 2014: 26). Coleman describes these activities as tricksterdom on the Internet. Since burning curiosity drives tricksters, they often ignore certain rules, norms or laws. One of the main characteristics for tricksters is not only being spontaneous and provocative, but also unpredictability or speaking in an ignorant way (Coleman 2014: 34). According to Coleman all these attributes are applicable to Anonymous, too. Yet since hackers do not have supernatural powers, they use various techniques, which she summarizes as the weapons of the geek. One of the main motivations for using such methods is dark humor or the so-called lulz, "a deviant style of humor and a quasi-mystical state of being." (Coleman 2014: 2).

Humor has a special position in the everyday life of hackers. Since all groups and cultures share various senses of humor, it is interesting to take a look at the specificities of this kind of humor. Coleman regards the characteristics of hacker humor as subtle and ironic. Moreover, "Hackers discretely embed nuanced, clever and frequently nonfunctional jokes within what are otherwise completely rational, conventional statements of function." (Coleman 2013: 103). There are though limits for making fun or jokes, especially when technical artifacts come into play, or the jokes harm the functionality or trustworthiness of the code or documentation.

> "Among hackers, humor is a distilled and parsimonious instantiation of the adoration of cleverness. It is an especially effective way of enacting hackers' commitment to wittiness precisely because, unlike the objects of hacker technical production, joking has no strict functional utility, and speaks to the inherent appeal of creativity and cleverness for their own sake. Joking is a self-referential exercise that designates the joker as an intelligent person and cleverness as autonomously valuable." (Coleman 2013: 104).

Thus *Hacker, Hoaxer, Whistleblower, Spy* provides essential information on the history of

Anonymous from its beginnings to present day with humoristic activities, puns, pranks, etc., and illustrates highly political statements and acts of the group. It also raises a crucial notion of anonymity that plays a significant role in FF. What role does anonymity play in FF? Is it possible to stay anonymous when using FF's network? Tom Boellstorff further addresses the important relationship between anonymity and pseudonymity in the book symposium. Since Anonymous use pseudonyms with varying reputations, would it not mean that pseudonymity is more central to Anonymous than anonymity? (Boellstorff 2015: 396).

Yet, to avoid any misunderstandings, it is extremely important to understand my concern in emphasizing the fact that there is nothing illegal about being a hacker and/or FF member. Although the term hacker is mostly used in a negative sense in the mass media, hackers themselves do not use this term to describe cybercriminals. To describea person who breaks a system's security, hackers have created the term *cracker* in defense against journalistic misuse (URL 4).

The Hacker's Dictionary (URL 5) defines hacker as (1) a person who enjoys learning the details of computer systems and how to stretch their capabilities – as opposed to most users of computers, who prefer to learn only the minimum amount necessary; (2) one who programs enthusiastically, or who enjoys programming rather than just theorizing about programming; (3) a person capable of appreciating hack value; (4) a person who is good at programming quickly; (5) an expert on a particular program, or one who frequently does work using it or on it; (6) an expert of any kind (one might be an astronomy hacker, for example); and finally the most common use of the term by journalists, but deprecated among hackers, (7) a malicious or inquisitive meddler who tries to discover information by poking around.

The Oxford English Dictionary (URL 6) has solved this controversy in a diplomatic way. It defines the term as "a person who uses computers to gain unauthorized access to data" while also providing the informal definition in the sub item in which hacker is just "an enthusiastic and skillful computer programmer or user."

In probably the most popular book on hackers, the journalist Steven Levy praises them as *Heroes of the Computer Revolution.* He depicts them as visionaries, risk-takers and even artists. He starts his historical journey on hackers in the 1950s and is still amazed by the fact that they anticipated the computer as a revolutionary tool. He was fascinated by hacker ethics, and especially by the utopian idea of improving the world. He further considers the philosophy of sharing, openness, and decentralization as a gift to us, even to those who do not use a computer (Levy 2010: ix).

Figure 1: Hacker humor at metalab. Redesigned cigarette machine

Hacker ethics have basically not changed since Steven Levy's book

(1) Access to computers – and anything that might teach you something about the way the world works – should be unlimited and total. Always yield to the Hands-On Imperative; (2) All information should be free; (3) Mistrust Authority – Promote Decentralization; (4)

Hackers should be judged by their hacking, not bogus criteria such as degrees, age, race, or position; (5) You can create art and beauty on a computer; and (6) Computers can change your life for the better (Levy 2010: 27-38). The Chaos Computer Club (CCC) extends these ethics by two more: (7) Do not produce waste in other's people data (Ger.: Mülle nicht in den Daten anderer Leute), and finally the aforementioned ethic (8) Use public data, protect private data (URL 7).

In contrast to Levy's book, Gabriella Coleman conducted ethnographic fieldwork among hackers and presented her results in the monograph *Coding Freedom: The Ethics and Aesthetics of Hacking* from an anthropological point of view.

> "While most of this ethnography illustrates how free software hacking critiques neoliberal trends and reinvents liberal ideals by asserting a strong conception of productive freedom in the face of intellectual property restrictions, it also addresses the material, affective, and aesthetic dimensions of hacking." (Coleman 2013: 4).

Although hacker culture is very complex and diverse, Coleman still finds a way to portray the culture's essential attributes and way of thinking. Some of these attributes are cleverness, ingenuity and wit. One can easily garner appreciation by, e.g. writing a clever code (Coleman 2013: 93). This specific kind of acceptance leads often to the well-known stereotype of the hacker as the clever nerdy guy. Even the creator of the Linux kernel Linus Torvalds jokes about himself as the typical prime example of this kind of a person. The programmer who does not go out too much and prefers to stay at home with closed curtains and no daylight; the MathGuy at school and the successful student at university who did what he wanted to do: explore the wide world of computer programming.

Nevertheless, Torvalds tries to avoid the term "hacker" because from his point of view it has changed its original meaning. He might though call himself a hacker in personal conversations with technical people, but using this term publicly means nowadays putting oneself on the same level as kids who break into data centers (Torvalds & Diamond 2001: 122). Moreover, he illustrates the classic fun factor of tinkering on computers and especially the beauty of programming. Although it might look boring from the outside, it is in fact extremely exiting, since you can make up your own rules and have the freedom to manipulate the results.

> "Part of the initial excitement in programming is easy to explain: just the fact that when you tell the computer to do something, it will do it. Unerringly. Forever. Without a complaint. (…) The difference, of course, is that while in physics you're supposed to figure out how the world is made up, in computer science you *create* the world. Within the confines of the computer, you're the creator. You get to ultimately control everything that happens. If you're good enough, you can be God. On a small scale." (Torvalds & Diamond 2001: 73).

Although some hackers differentiate between *hackers* and *crackers*, others do not define these terms in such a strict sense. The techniques of illegal and legal kinds of hackers are often very similar. Thus the more important part for Coleman is to grasp similarities, instead of emphasizing the differences. The common denominator for hackers could be the tendency to value some basic liberal principles, such as freedom, privacy, and access, in combination with adoration for computers.

> "Foremost, hacking, in its different forms and dimensions, embodies an aesthetic where craft and craftiness tightly converge. Hackers thus tend to value playfulness, pranking, and cleverness, and will frequently perform their wit through source code, humor, or both: humorous code." (Coleman 2013: 17).

However hacker culture is a dynamic process and constant debating among hackers on the meaning of the word *hack* is nothing unusual. Coleman further uses Marshall Sahlin's "contemporary culturalism" as a form of "cultural self-awareness" to describe the reflexivity among hackers and especially their reference to their culture and ethics (Coleman 2013: 17). The presence of the researcher or journalist often evokes a reflexive process among the group being studied. In the same way that Steven Levy started the process of reflexivity among hackers during work on the book, I, too, was often a key catalyst for FF to reflect on their own philosophy and goals. Sometimes I even switched to the role of providing consultative support during our meetings. Searching for causes behind the low participation of women in the organization was, e.g. one of the frequently mentioned topics in such discussions.

Although Ada Lovelace is often considered as the first computer programmer in the 19th century, participation of women in the FS movement and/or hacker culture in general is still very low. The huge contribution of women is extremely under-represented in computer history in general. Only recently the topic of gender and technology has stared to interest mass media, filmmakers and conference organizers, with one such event being initiated in 2009: Ada Lovelace Day. This day is an international celebration of the achievements of women in science, technology, engineering and math (URL 8). Projects such as Debian Women or LinuxChix were founded in order to raise women's voices in the hacker community. Other projects, like the platform copinedegeek.com, were created by a team of six women as "foremost a result of years of experience of living with a free software geek" (Karanovic 2012: 194). The idea behind this platform was creation of a funny website made by women for women. The turning point in the history of the website though was when the majority of visitors became male. They wanted to understand the female perception of them, i.e. geeks from a women's point of view.

As one can already recognize, the terms *hacker*, *geek* or *nerd* are very intertwined.

And in fact, the line between these terms is quite blurred. Probably the most important difference between these three terms is that *geek* and *nerd* do not have any criminal connotations. *Geek* is usually "a digital-technology expert or enthusiast (a term of pride as self-reference, but often used disparagingly by others)" or just "a person who has excessive enthusiasm for and some expertise about a specialized subject or activity." (URL 9). When using the term *nerd,* people often want to emphasize even more the socially awkwardness, boringness, or lack of style. Nevertheless, this person is usually perceived as intelligent, but single-minded "with a nonsocial hobby or pursuit." (URL 10). Linus Torvalds refer to himself both as a *nerd* and *geek*, but notes that it was a time where it was not cool, sexy or hip (Torvalds & Diamond 2001: 26). The trend for perceiving nerdy and geeky persons or hackers as intelligent, funny or even cool can be seen, e.g. in highly popular and commercially successful TV Series such as *The IT Crowd (2006-2013), The Big Bang Theory (2007-), Mr.Robot (2015-)* or the films *Hackers (1995), The Matrix (1999), The Fifth Estate (2013)* and in the videos of extremely famous YouTubers, such as *Angry Video Game Nerd (AVGN),* etc. Although the depiction of hackers as cybercriminals is still present, one can notice a small shift towards more positive representations and blur the line between hackers, nerd and geeks in general.

Not only is the media's interest in hacker culture very clear, hacker conferences are also noticing more and more participants every year. During my fieldwork, the CCC, Europe's largest association of hackers, reactivated the "CCC Wien" in metalab in Vienna. For more than thirty years the CCC has provided

> "information about technical and societal issues, such as surveillance, privacy, freedom of information, hacktivism, data security and many other interesting things around technology and hacking issues." (URL 11).

According to Coleman, hacker conferences are ritual-like affairs with a reinforcement of group solidarity and reconfiguration of the relationship between time, space, and persons. They are

> "rituals of confirmation, liberation, celebration, and especially reenchantment, where the quotidian affairs of life, work, labor, and social interactions are ritualized, and thus experienced on fundamentally different terms. (…) A little bit like a summer camp but without the rules, curfews, and annoying counselors, many hacker cons are the quintessential hacker vacation – one that often involves furiously exhausting work, a lack of sleep, and the need to take a real break afterwards." (Coleman 2013: 48).

Many FF members also attend the CCC every year. Since the amount and diversity of participants is continually expanding, it is a great opportunity not only to meet or talk with other hackers in person, but also to gain the opportunity to discuss hot topics with people with

whom FF members usually do not interact. These discussions vary from topics concerning legal situations, debates on copyrights or net neutrality to topics related to the future of Internet politics. One should not think though that hackers have become public figures or are using public spaces for social and technical production. Most are still seeing domestic and private spaces as their major residence. The still tinker and build technology as they have done in the past, but now they have more technical know-how and much faster computers. The used specific language, lingo and/or terminology continue to be lively and creative in the present time (Coleman 2013: 59).

In contrast to other classical literature on hackers, Coleman has conducted field research and presented an ethnography – which provides definitions, experiences and views of/with/on hackers, crackers, liberty, freedom, ethics, etc. – from an anthropological point of view. The benefit of an ethnography remains in the development of critical distance to the field of study without idealizing or romanticizing someone's beliefs or worldviews. One such difference between popular literature on hackers and Coleman's ethnography could be the following example: Richard Stallman, the founder of Free Software Foundation or as Torvalds depicts him, "the God of Free Software" (Torvalds & Diamond 2001: 58), among many other famous activists, speaks of his visions, convictions or thoughts on how the FS community should look or how it looks from the inside FS philosophy usually emphasizes "free" as in "freedom of speech" and not in "free beer" (this is a point to be discussed at length in the next chapter). But only by doing an ethnography did Coleman notice an ironic fact that at first hackers actually saw FS as equivalent to free beer:

> "In fact, the very expression 'free as in speech' was nearly nonexistent or at best uncommon until at least the mid-1990s. Although the message of freedom was circulating along with free software, many hackers initially grasped this new technological wonder and its moral qualities using the language of money and consumerism." (Coleman 2013: 38).

That example offers not only new theoretical perspectives for my work, but proves the huge efficiency of participant observation as a methodology in general. One does not simply listen to informants, but can actually observe explicitly their behavior in everyday life or even recognize any discrepancies. Thus both Coleman's books provide the reader with new solutions, inspirations, and approaches on how to continue with field research, what to look at, and how to determine what specific situations mean (e.g. the aforementioned hacker humor).

Gabriella Coleman further discovers the discrepancy between the in- and outside of how hackers approach each other. While the well-known opinion is that they treat everyone

equally, from the internal perspective, they "construct themselves as high-tech cognoscenti creating the bleeding edge of technology" (Coleman 2013: 120). Judging a person only by his/her performance or individual abilities in a way leads to a meritocratic ideal and elitism. And although hackers have not created an ideal working meritocracy, they still keep the rules for entering their environments very simple. "As part of the equalization process, one must endow the community of hackers with resources like documentation and the fruits of one's labor: source code." (Coleman 2013: 121). In this context the fourth hacker ethic of judging a hacker only by their hacking and nothing else, makes even more sense. This kind of thinking enables the organization and performance of various intellectually challenging tasks and projects, such as bypassing user restrictions.

According to Stallman, searching for clever ways to solve a problem, bypassing security to gain more freedom or simply adapting certain technology for one's requirement, is the true meaning of hacking. Hacking though does not always have to have a clear aim, specific meaning, or usefulness. It can happen simply out of curiosity or playful cleverness in order to test the limits and possibilities of a particular technology. The utopian world of hackers however does not know security breaking, since there will be no security to break. In short, "playfully doing something difficult, whether useful or not, that is hacking." (URL 11). The misunderstanding of hackers as cybercriminals and security breakers is obvious. By concentrating on just the illegal aspect of hacking, the term has obtained a negative perception. From the inside, acts such as bypassing security do not necessarily go hand in hand with the purpose of stealing money or a similar negative intention; from the outside these are criminal acts. Nevertheless, it is necessarily to understand that FF members are sharing the hacker culture without illegal aspects. By depicting the personal beliefs and values of the members in the empirical part, I will try to show the hacker culture of FF.

This is why several authors, including Gabriella Coleman's research on Anonymous, differentiate between the three hacker types: the so-called white hat, black hat, and grey hat. Although you will find many other categorizations such as blue hat, script kiddie, etc., these are the three main classifications. According to *The New Hacker's Dictionary* the cracker or black hat is

> "someone bent on breaking into the system you are protecting. Oppose the less common 'white hat' for an ally or friendly security specialist; the term 'gray hat' is in occasional use for people with cracker skills operating within the law, e.g. in doing security evaluations. All three terms derive from the dress code of formulaic Westerns, in which bad guys wore black hats and good guys white ones." (Raymond 1996: 98).

For the purpose of my field research, I will not use the many differences of hackers, which are

nowadays present. On the contrary, I assume that is it highly important to operate with the term *hacker* in the sense of hackers themselves. Moreover, without switching too much in the empirical part of the thesis, one does not simply call himself hacker (according to my interview with the Austrian net neutrality activist Thomas Lohninger). You may share the same ethics or values, but do not speak of yourself as a hacker all the time. This task is for those who surround you.

2.3) Christopher Kelty and Free Software

"When we think about free software…we need to think about software as a means of expressing our freedom, but also defending our freedom."
Edward Snowden at HOPE X

What is free in FS? I suppose this question is probably the most essential for this chapter, since FF underlines the freedom and openness of the organization and describes itself as a free network (Ger.: Freies Netzwerk). In his book and TED talk (URL 12), the already mentioned father of FS, Richard Stallman, sets up a link between FS and free society. This link might be surprising at first, but makes sense when one looks at the history, ideas, and philosophy behind FS.

From Stallman's point of view, software should fulfill four essential freedoms in order to be credited as free. *Freedom 0*: The freedom to run the program, for any purpose. *Freedom 1*: The freedom to study how the program works, and change it to make it do what you wish. Access to the source code is a precondition for this. *Freedom 2*: The freedom to redistribute copies so you can help your neighbor. *Freedom 3*: The freedom to distribute copies of your modified versions to others. By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition here (Stallman 2010: 3).

Although the principles and ideas of FS might seem initially too idealistic, it is nevertheless extremely important to highlight them in order to give a full portrait of at least the basis way of thinking in the FS community. Stallman's background extends to his working experience at the MIT Artificial Intelligence Lab in 1971, where he became part of a software-sharing community. However, when the community collapsed in the 80s, he quit his job at MIT and decided to start the GNU Project, a project based on the aforementioned principles (Stallman 2010: 7-10). The name GNU is one of the examples of hacker humor. This recursive acronym stands for "GNU is Not Unix", thus the letters stands for the acronym itself. Torvalds asks himself ironically, though, if anyone other than geeks would actually

comprehend this computer science in-joke (Torvalds & Diamond 2001: 58). He further wrote the FS Manifesto, the General Public License (GPL), and the FS copyright license. His so-called copyleft method protects GNU software from becoming proprietary software. By using the copyright law, copyleft puts the usual intention upside down. The user obtains permission to run the program, copy it, modify, and even distribute modified versions without any restrictions on the program, but also has the safety of keeping it free. This is why no user is allowed to add any restrictions to the software or any changes which could further cause harm to its essential freedoms (Stallman 2010: 12-13).

In fact, the idea behind copyright is relatively new. Under widespread mass literacy and use of the printing press in England and Germany in the 18th century, writers and publishers searched for different ways to defend themselves from illegal distributions of their works. To capture immaterial creativity with a printed page and to give the author rights during uncontrolled circulation was the central goal behind the copyright law. Further, the unique subjectivity of artists or creators expresses a deep part of themselves. In other words, the separation between the body and the actual artifact does not matter; what counts is the result of one's creative work, be it a poem or a statue (Golub 2004: 524-525).

Nevertheless, Stallman regards these rules as outdated under current circumstances and technological developments. The rules of the pre-digital centralized press are not applicable to the decentralized concept of the World Wide Web (WWW). Taking this into account, the rules should be changed and adapted to current online decentralized environment. He is using the example of the high necessity of open access in science and scientific literature to explain the current inefficiency of the copyright law for promoting the progress of science. According to Stallman, articles should therefore be distributed in nonproprietary formats as well as in a way that provides open access for all (Stallman 2010: 121-122). The initial link between FS and free society is now more than clear. In his idealistic philosophy FS is more than just a concept for providing various freedoms to the software user. Stallman is convinced that a society that wants to be free needs freedom as a foundation. In his view, when someone wants to help, e.g. the neighbor, it should not be called piracy. Thus, by transforming society offline, FS has the ability to also transform it in online environments. In the same way that governmental laws are not closed or belonging to a person, FS should be open and free for all (Stallman 2010: 40).

Although FS and Open Source (OS) are often treated as the same, Stallman distances himself from the main ideas of OS. From Stallman's point of view, OS misleads the freedoms of FS, since it places profit above freedom, community or the principles. The more crucial

goal of OS is to make high-quality and powerful software with the support of business models. Thus FS and OS are speaking more or less about the same software, but do not share the same beliefs or values. For Stallman, this is the important link between FS and free society. As a FS advocate one should praise the idea of freedom and not only in combination with technology. "Free" should be related to freedom and not to price. In fact, freedom should be the core and primary goal of FS everywhere (Stallman 2010: 22-23). Gabriella Coleman sees this disagreement between Stallman and FS in one way while Eric Raymond has a different opinion. While Stallman fears the ruin of values of hacker culture by OS, Raymond for his part wants to align hacking with capitalist thinking in order to raise the social status of hackers.

> "(…) Raymond wanted to bring open source to the market to improve the hacker cultural experience. If hackers could gain a respectable foothold among 500 companies, he argued, it would allow them to reap enough social capital so that they could escape a cultural ghetto of marginalized nerdiness." (Coleman 2013: 79).

And it truly was an enormous success. Not only has OS received huge media recognition and attention as a Silicon Valley miracle, but geeks were also amazed by the fact that they could finally show their secret work life publicly or clarify to employers why FS without any warranty or technical support was much better than it's closed source counterparts (Coleman 2013: 80). Raymond theorizes the concept of the commercial world as the cathedral model, and the Linux world as the bazaar. Hence Torvald's style reminded him of a babbling bazaar with early and often releases or diverse approaches and agendas. Surprisingly, this working style showed great success and was in a way even better than the classic cathedral model with strict regulations. Although the possibility to modify Linux archives without censorship by clear leaders was available to all, such openness did not result in chaos. Instead this system has presented time-proven stability and coherence (Raymond 2001: 21-22). However, since I will mostly concentrate on the original ideas and philosophy of FS, I have decided to use the term FS only and not OS in my work.

Nevertheless, Christopher Kelty states that these two terms refer to identical practices, licenses, tools, or organizations. In fact, according to him both terms differ only in verbal statements, but not in the sharing processes. Although Stallman was seen as holding back the success of OS in the commercial world by propagating his dogmatic beliefs, and was often depicted as a crazy person with communistic and idealist worldviews, he had very much in common with Raymond. The latter for his part was seen as a traitor to FS, since he was trying to sell its principles, promises, and ideals. The common element for both though was the creating of objects in the form of software with identical concepts, such as openness, licenses,

and organizational schemes. They both give hackers the opportunity to be away from the mainstream and to look beyond the horizon of proprietary software development (Kelty 2008a: 116).

In contrast to other software developers, FS is often not only considered a philosophy, but also a social movement, a way of life, a critique or even a revolution (Kelty 2004: 499). Christopher Kelty is an anthropologist who wrote among many articles, *Two Bits: The Cultural Significance of Free Software.* He speaks of a recursive public in order to analyze and illustrate FS's cultural significance and its consequences. It

> "is a public that is vitally concerned with the material and practical maintenance and modification of the technical, legal, practical, and conceptual means of its own existence as a public; it is a collective independent of other forms of constituted power and is capable of speaking to existing forms of power through the production of actually existing alternatives." (Kelty 2008a: 3).

Applicability of this concept to FF is obvious. As for recursive publics, the focus of FF is on the radical technological modifiability of their own terms of existence. Moreover,

> "in any public there inevitably arises a moment when the question of how things are said, who controls the means of communication, or whether each and everyone is being properly heard becomes an issue. A legitimate public sphere is one that gives outsiders a way in: they may or may not be heard, but they do not have to appeal to any authority (inside or outside the organization) in order to have a voice." (Kelty 2008a: 3).

The first reason why Kelty operates with the term *recursive* is to emphasize "the activities of making, maintaining, and modifying software and networks" (Kelty 2008b: 3). All these activities are the core elements of WCNs and FF. In addition, the second reason is the task of showing

> "the recursive 'depth' of the public, the series of technical and legal layers—from applications to protocols to the physical infrastructures of waves and wires—that are the subject of this making, maintaining, and modifying." (Kelty 2008b: 3).

Both reasons represent not only the philosophy and ideology of FF, but also speaks of the main reason why the network actually works: physical infrastructure. In this sense, FF is a very unique form of WCNs. The organization not only provides free access to the Internet, but also attempts to build own physical infrastructure. In his provocative claim that FS does not exist, he puts forth the proposition that "Free Software – and its doppelganger open source – is constantly becoming." (Kelty 2013). It is extremely important to highlight the dynamic of hacker culture and FS. Since FS is changing at a very fast rate and in an often unpredicted way, one should try to grasp the continuities. But that is what FS can offer to the user, a participation in a dynamic and creative atmosphere and process. Every day FS comes up with new projects, ideas, goals and tools such as open educational resources, open movies, open

access and other services, which are platforms for putting one's ideas into practice. Kelty though advises being very critical to claims and promises of open, free, public, democratic etc. because nearly everyone, including defense intelligence agencies, adapts these claims. Furthermore, one should not only focus on these statements and promises, but also look behind the emergent processes. The most powerful characteristics of FS are still responsiveness and public aspects. Thus, by giving a clear definition of FS, these characteristics would probably disappear. These characteristics are even inspiring other domains and commercially oriented companies such as the so-called social music projects or collaborative rating, sharing of videos and music and so forth. Yet since most of these projects have commercial interests, Kelty does not identify them as recursive publics. The lack of open access to structure and technical specifications and the possibility for modification makes these projects anything but recursive publics. This small detail at first makes a huge difference when taking a closer look. Although they are enthused over providing the consumers a platform with the possibility for media sharing or allocating information and knowledge, they do not necessarily want free access to the infrastructure, which is the foundation for producing such information and knowledge (Kelty 2008a: 301-303).

This example makes it clear that FS developers and advocates are more than just people whom Internet simply brings together. They also cannot be merely restricted to activities of writing, speaking, arguing, or protesting. They rather share moral and technical understandings of order and are an independent public, which can build, maintain, and modify itself.

> "Two things make recursive publics distinctive: the ability to include the practice of creating this infrastructure as part of the activity of being public or contesting control; and the ability to "recurse" through the layers of that infrastructure, maintaining its publicness at each level without making it into an unchanging, static, unmodifiable thing." (Kelty 2008b: 15).

Hence the Internet represents a radicalization of flexibility. Programmers from all over the world are not only using the infrastructure for creating diverse applications that are taking advantage of this network, but they are also rewriting, adapting or creating new versions of such applications with new ideas and goals (Kelty 2008b: 16). And since FS is not an outgrowth of a 100-year-old organization, it is easy to change any rules and/or adapt various structures (Kelty 2008c: 562). According to Kelty this is essentially the core concern of FS. FS uses systems and structures of the modern world to circulate knowledge in an alternative way. Although the people creating FS are standing for certain ideals in public, they do not

follow them strictly in the sense of a social movement. Thus he considers them rather as a "loose affiliation of people focused on the technical and legal basis of public discourse" (Kelty 2008c: 561).

But how is it possible to program software without a strict working schedule or classic step-by-step guide. In other words, many people ask themselves how FS as a loose affiliation of geeks manages coordination. Coordination though is one of the foremost key elements of FS. Christopher Kelty (2008b: 239) describes the coordination as a "complex story of experimentation and construction." It is therefore an experimental system with ongoing changes, which constantly seeks new results and adaptations. FS is "the best example of an attempt to make transformation public, to ensure that it uses the advantages of adaptability as critique to counter the power of planning as control." FS geeks value the proposal of criticism and offering of alternatives. As soon as they give up this function as a recursive public and stop criticizing, experimenting or modifying any agreements, they will become private employees.

Thus, terms with usually positive connotations, such as stability, permanence or persistence, are not applicable to FS. In fact, the power of FS is in the lack of these characteristics; it is "principle made material." (Kelty 2013). Without fetishizing or hypostasizing, FS is a recursive public providing enormous critical power. It allows use of material objects with specific values and principles in mind. The duality of FS is constructed by contradictory aspects, which are however logical and comprehensible at second glance. Being material and moldable at the same time or rigid and reconstructable demonstrates not only the constant motion of FS, but also the power to "leave the materialism radically open to change." (Kelty 2013). This is why Christopher Kelty was surely thinking in a forward manner in proposing his provocative statement that there is no FS. I, too, would suggest that it is truly easier to answer what FS is not, rather than what FS really is. It is absolutely not proprietary software or a cathedral in the terms of Raymond. It is absolutely not static or predictable. And it is unsurprisingly not tedious either. As in the case of Coleman, you can easily find yourself researching Anonymous immediately after finishing a book on hackers and FS.

Hacker culture is as complex as a labyrinth with different dissecting and divergent paths. Nevertheless, Kelty and Coleman, chose the "right" paths when they wrote their respective ethnographies, i.e. they were able to find treasures and exits. Many paths though have remained untouched and hidden. However, their books are a great success in that they have reached the desired destination and presented prolific results.

3) "FunkFeuer Wien" and Wireless Community Networks

The movement behind so-called *free networks* and WCNs has become more and more popular in past years. Free network does not mean free Wi-Fi and/or gratis Wi-Fi: The main idea of these networks is to have all tasks and duties of ISPs performed by the users themselves, including building of own physical infrastructure. Own communication structures should further be free of commercial or governmental control. The network should have the possibility to function only by its own infrastructure and without any links to other infrastructures or commercial ISPs. Participants develop the network by using the technology of Wireless Local Area Networks (WLAN). Instead of building isolated single hotspots where only a small amount of people can access the Internet, WCNs try to connect their hotspots in order to cover greater areas and perform with more speed. Since the network is not bound to any commercial ISPs, its users perform infrastructure maintenance, saving many costs for all members. Thus participants should collaboratively determine the building process, service provision, and ruling structure (Medosch 2004: 7-8).

Although engineers and hackers were experimenting with computers as communication devices in the 1970s and 1980s, the creation of the World Wide Web (WWW) started the real boom of Internet use. Since the very beginning of the development of communication technologies, the conflict between centralization and decentralization has always been present. Internet access started as a successful story, when the market was booming and, due to high competition, companies began to build their own network infrastructure, leading to many new innovations. However, the story has evolved into oligopolies in national and regional markets with frequent abuses of dominant positions by network operators. Further, operators have started to violate the principles of net neutrality (see chapter 4.6), and are making diverse regulations, controls and even surveillance programs. On the contrary, WCNs are based on the principle of decentralization and are experiencing a huge revival because they offer an alternative that allows for avoidance of highly capitalized ISPs, and additionally facilitate self-management of one's own network (De Filippi & Tréguer 2016: 261-263).

In a given city is not unusual to find many points of gratis WLAN access offered by, e.g. cafés, restaurants, or even private persons. Thus the idea of free networks would involve connecting all these nodes together in order to create one local network. Benefits not only include greater speed – because people usually do not use their whole bandwidth – but also the development of own services. *Athens Wireless Metropolitan Network* for example provides not only the possibility for Internet telephony or video streaming, but also local

search engines called *Woogle* and *Wahoo*. The vision is to create a network without censorship or commercial interests, and that is accessible to all and belongs to the community (Medienanstalt Berlin-Brandenburg 2014: 8-9). The first WCN was created in London around 2000 and even then already aimed to build a free network capable of providing independent exchange of data without governmental control or censorship, and with full optimal use of Internet bandwidth. It is not important though if the communities are organized as private user initiatives or official organizations.

What counts is the right to have the possibility to simply give another person his or her own Internet access. As a matter of course, the sharing of one's access leads to creation of new nodes with further possibilities for sharing. As soon as the network is stable enough to provide some participants with Internet access, it can function without commercial ISPs. As in the case of FF, people create a meeting point or found an organization in order to deal with many participants or people interested in WCN or FF (Hiesmair & Dobusch 2009: 21-22).

Additionally, one of the first English WCN projects called *Consume* has immensely reduced costs while establishing a self-governing network independent from British Telecom. WLAN made it possible to renounce cost-intensive electrical wiring by operating wirelessly. The so-called *Consume script* written in summer 2000 has further allowed for the copying and transferring of *Consume's* ideas, basics and structures. It was certainly a defining moment for other parties interested in having the freedom to use the script, its concepts and suggestions, and to further develop, create and adapt it to their own networks. On this account other projects have followed not only in London, Bristol, Cardiff, Manchester and other regions of Great Britain and Europe, but also in the United States. The openness principle of the concept influenced many people to develop further alike initiatives and projects (Medosch 2004: 58-59). Bridging the digital divide was another goal that WCN followed. The divide was not between the so-called technically developed word and other lesser-developed areas; at the beginning, even such metropolitan areas as London did not have Internet access throughout the city. For example, the principle of WCNs allowed for the connecting of parts of East London to the Internet, and also many other smaller towns (Mackenzie 2010: 48).

> "They entailed a different sociality since they were often put together and maintained by groups of volunteers who helped their neighbors join or access a wireless node that itself was connected to a commercial broadband Internet connection. These attempts to build suburb, town, or citywide infrastructures were fragile, sometimes temporary accomplishments. To get information to flow across the network along many different paths, rather than just to and from periphery to center, community wireless groups experimented with different topologies such as meshes and grids. Free networks envisaged a different topology because they sought to do more than connect people to the Internet." (Mackenzie 2010: 48).

Besides this *more* aspect (to be illustrated in the empirical part in detail), one of the best ways to avoid centralization is to develop a so-called mesh network. Using the peer-to-peer principle allows for communication without a certain *master* at the top of the hierarchy, i.e. a mobile telephony or any other WLAN networks. It is, e.g. impossible to telephone without a provider base station. Thus clients could communicate only through the *master* or base station, but certainly not among each other. This centralized principle indeed allows control and easy coordination, but is inefficient for the goal of WCNs. However, all nodes help to transfer data in the peer-to-peer structure without one single centralized node, and offer the ability for the network to heal itself, which engineers call *wireless ad-hoc network* (Aichele 2014: 20-21). By using this scenario, even remote areas can gain Internet access because nodes can simply communicate with each other. A mobile phone on the other hand is pretty much useless, since it needs a base station that may be too far away; in fact, it needs a base station even if one were to call a person sitting only a few inches away (Butler 2013: 135).

Tech activists have often taken the position that commercial motivations and ideas are not at all compatible with the honest ideas of a democratic public sphere of the Internet. In fact, the Internet should be an ownerless public space with the ability for small firms and individuals to compete with each other and promote innovation. In the early 2000s the spirit of emancipation further declined when it became clear that regulations and increasing oligopolistic prospects were irreversible (De Filippi & Tréguer 2015: 6-7).

The beginning of FF infrastructure also initially had commercial interests. At a time when FF was not a WCN and labeled under a different name(s), Franz Xaver and Roland Jankowski – heads of the company – were trying to save the network from failure by turning the network into a decentralized structure. There lie the origins of today's FF network as a WCN. When the network seemed to be in a hopeless situation, a change took place in favor of a shared network, and this shift still exists today. At the time, around 2003, the founders of FF – Aaron Kaplan, Michael Bauer, and Markus Sulzbacher – were searching for a possibility that would allow for creation of a network that would belong to its users.

> "I was at that time in Amsterdam at a hacker space, which was not as popular as hacker spaces are now. And there was one guy, who was working with software called mobile mesh. Coincidentally I have visited a computer science lecture at the university before, which was about distributional systems. And I was fascinated by this topic and I have tried it out. Basically, they are simply communication protocols where one communication nodes says 'Hey, I'm here. That is my IP address. You can reach me here. And by the way I can reach other nodes and have contact to them.'" (Aaron, 29.12.2016)

The next step was to find a way to provide organization, technical assistance, and establish communication within the participants of the network. It was possible to make further

progress by making the decision to register FF as an organization. That is what differentiates FF from other forms of WCNs, for example *Freifunk* in Germany. FF is an organization with members and a board that can be elected by these members. Various modifications and replacements with cheaper hardware or building processes of course consumed a great deal of time and energy, especially at the very beginning of the foundation of the organization. As soon as the nodes were ready to use the mesh principle, the network became what it is today. However, FF has made a big contribution to the development of the mesh routing protocol OLSR and has since then built many new nodes (approx. 300). Besides Vienna, FF has its equivalents in many other regions of Upper and Lower Austria, Graz, Linz, Salzburg, etc. (URL 13).

4) Personal beliefs and values

FF members consciously distance themselves from any relation to politics, though admittedly such a decision could be interpreted as political. Nevertheless, politics are usually associated with party political processes, which FF has no desire of being associated with. In addition, FF tries to avoid any relations to political parties because such entities contradict the organization's basic vision and philosophy, both of which are based on egalitarian principles. Even such terms as *moral* or *moral-ethical* are not experienced as positive. Some FF members understand morality with a strong connection to indoctrination. The differentiation between good and bad or black and white is very often not that obvious. Moreover, the hacker scene including hacker humor does not accept politically correctness in some cases. Although most FF members and/or hackers are certainly against any forms of discrimination, they do see some rules of conduct as restrictions and attacks on privacy. Thus *morality* is not only a blurred and difficult term to grasp, but also a term that has a specific societal meaning, which attempts to describe *right* actions. Expressions such as *moralizer* or *upholder of moral standards* show the strong teaching aspects of depicting someone as acting according to his or her morality. In fact, FF members would not interfere in the behavior of someone they do not know or attempt to teach him or her how to behave in a proper way.

However, personal beliefs and values represent the very specific notions of FF members without putting them in a specific political sphere. The choosing of this expression allows one to depict the internal perspective of the organization and personalize the statements of the interviewees and many other conversational partners. This formulation was an attempt to find a neutral way of describing all six categories from FF's perspective. Since neutrality is a concept of particular importance to FF members, personal beliefs and values should only show participants' ways of thinking without exaggeration. Thus personal beliefs and values represent reasons for a particular course of action. They are the aspects that motivate every member into a certain personal way of thinking and way of usage in further steps. Both the expression *personal moral reasons* and the expression *personal convictions* are highly appropriate to describe these processes. Furthermore, it is important to speak of beliefs and values in FF's case, and not pick one single term from both because understanding of all facets demonstrates the variety and dynamism that occurs when members are thinking about a particular notion of categories such as outlined below. Time and again since the beginning of ethnographic fieldwork, participants have spoken using expressions such as *I firmly believe.* The logical consequence was to select an expression that reproduces FF members' words as well as justifies this decision by delineating the categories in the most comprehensive way.

4.1) Freedom

> "At the beginning, a lot of people participated because it was cool, something like amateur radio. But after that they immediately thought: hey, it's free!" (I8, 18.01.2016).

Although there are the aforementioned difficulties in using the term *freedom*, I think it is still one of the most important philosophies for the FF movement. Richard Stallman's notion of *free* as in "freedom of speech" and not as in "free beer" mostly represents FF's notion of freedom. The best way to describe the notion of freedom is certainly to say "the infrastructure belongs to us." (I1, 25.01.2016). In having the ability to change antennas, create new nodes, vary different settings on routers or obtain own servers, members of FF follow the idea of freedom in the sense of controlling themselves and not other people or companies. According to Stallman, digital technologies can give freedom, on the one hand, and, on the other hand, take freedom away (Stallman 2010: 209).

This simple formula fits perfectly to FF's idea. If one does not have the ability to control one's own internet, someone else will take control. By using commercial ISPs, one gives up the right to freedom and acts only as a passive user or consumer. Participating in FF hence not only provides more rights in being an active user, but also goes hand in hand with such terms as owning and/or responsibility, the latter of which I will depict further below.

However, it is not surprising that the notion of freedom is interwoven with a great number of complexities; yet nearly all members of FF share a very simple and at the same time similar understanding when speaking of expressing freedom. To break down the diverse complex perceptions, freedom is expressed by the ability to not only make one's own decisions, but also to allow one's creative mind the freedom to express itself. Looking behind the curtains of technology and "throwing away the instruction manual" (Clemens, 08.02.2016) characterizes the perception of freedom and creativity. The liberating feeling of breaking the given framework of a prescribed way of using media technologies by manufacturing companies, leads to new motivations to translate one's own creative ideas into action. It is a tightrope walk between breaking the rules (not in the illegal sense) and simply following the urge for discovery. The enthusiastic will for experimenting with technology encompasses the dynamic processes of the FF network.

Thus, original motivations to become a member of FF were not at all political, philosophical, or ideological. Nevertheless, the majority of FF is impressed by philosophy as well as by the ability for DIY, tinkering and/or the fascination for exploring technology in general. The often-addressed identity crisis during meetings came much later, when the network started expanding, and more and more people began searching for ideas or goals of

the organization. On the one hand, FF escapes the strict definition of the term freedom by simply experimenting with the network. Members of FS communities are fascinated by free access to the infrastructure, however in this case with the bonus of actually physically modifying or changing it themselves.

> "I gained a lot of freedom at FunkFeuer. Technology on rooftops was just one thing. The other thing was that it was possible to work in the area of networks that you usually were not able to do outside of companies. Of course you could build a small lab at home, but it is much cooler to build something that many people are using and that actually works. The Internet was quite easy accessible in the mid-2000s. We had many contacts to different providers and they gave us the opportunity to make really cool things." (I9, 21.03.2016).

Ironically, the absence of a clear definition of freedom gives FF the opportunity to reinvent, rethink or express itself in very different ways. The lack of strict frames allows the participants to act independently and implement one's own ideas. Is this the loose affiliation of people Christopher Kelty (2008c: 561) was talking about? But what keeps them together? A platform for realizing personal visions, ideas, and goals is truly a unique facility.

Although FF has permuted many projects, it does not mean that all of them were conducted unanimously. As in Gabrielle Coleman's book title *Many Faces of Anonymous,* FF has a lot faces as well as facets. Thus, could that mean that FF's notion of freedom places personal desires and consequently expressions of freedom more in the foreground than that of the whole organization? The aforementioned structure as a "loose affiliation of people" enables FF to not only avoid discrimination of other participants or the breaking of any rules of the organization, but paradoxically also focuses on the main interests of the majority: experimenting and/or expanding of the FF network. It is enough to find similar-minded people in order to realize a project or put an idea into practice. The support of refugees with free Internet access, for example, came into existence not because of majority enthusiasm. Since some members work in a humanitarian field, it was possible to coordinate themselves and use various personal acquaintances and volunteers to install a new node. However, volunteers often do not share the same thoughts as "project leaders." Usually each has different motivations for participating and helping in a project.

Thus, when FF provides refugee houses or events like the Life Ball with Internet, it does not automatically lead to the conclusion that all helpers are in agreement with the political views of the organizers. In fact, the motivation for helping can initially be quite surprising. Some members are, for instance, simply fascinated by the ability to climb on rooftops. It is not only an extreme surge of adrenaline, but also a feeling of being free in a bureaucratic city led by strict rules, norms and regimentations. It is a change of scenery from

tedious tasks in the mundane working life. Since FF is a non-profit organization and one cannot ensure secure and sustainable livelihoods by volunteering, many committed members consider all such activities to be a hobby. Nevertheless, it is a hobby with serious duties, discussions, disputes, and compromises. FF exists because of openness, which members are missing in the "outside world" or the cathedral model in terms of Raymond. The unbelievable advantage of participating in such an organization is the ability to establish contacts, friendships, and new acquaintances, which in turn can be helpful in the "outside world." Be it providing help for repairing diverse devices, programming software, or simply discussing current Internet politics, all such activities have social value. Here people with completely various backgrounds are meeting on equal terms. The usual requirements of professionalism, rules of etiquette, and obligations as an employee, spouse, parent and so forth, which most people are confronted with in their daily business, are irrelevant. The feeling of being in a community with similar-minded people, but without the confines of a contract, motivates the cultivation of social contacts and develops new strategies for network expansion.

Figure 2: Setting up and attachment of antennas

It should be noted though that among participants all these disputes and conflicts sometimes lead to a withdrawal of any motivation to help and volunteer. Since every member brings one's own ideas and images of how the network should or could look, it is sometimes problematic to set a new course for the whole organization. Some active members even sharply criticize the lack of a clearly formulated mission of FF. As a result, the number of

participants has stagnated over the course of the years. Thus, the most important task should be to make FF attractive not only to techies, but also to newcomers, women and especially for non-technically minded people. That is why the main purpose of FF should be the creation of a so-called "citizen's network." Hence, FF's network should be more than a project for techies, geeks and hackers. By developing a clear message and/or mission, it should provide all citizens with free and/or libre Internet, which relies on grass-roots democracy principles. One possible step in this direction could be the offering of training opportunities or even the generating of jobs with specific profiles to make FF more successful. In the eyes of these critics, people without a technical background are not able to benefit from the freedom this organization offers. How much can a person without this specific techie knowledge modify, change, or create? The answer is barely anything. Thus, the main task for FF should be to motivate people to acquire basic technical know-how and also to shape the network in the simplest way possible. Otherwise it will remain an experimental project for geeks similar to amateur radio.

> "The present situation is that people who are representing FunkFeuer are more and more engaged. But only for themselves, that is, for a narrow circle. I often say that if FunkFeuer does not expand or establish new user groups, then it will turn into an amateur radio club. That does not mean that amateur radio is bad, but they have a very narrow user group as well. They have a problem finding young people. If you go to an amateur radio meeting, you will barely see any young people. (…) It could be a very similar problem with FunkFuer." (I9, 21.03.2016).

The "hacker spirit" (Aaron, 29.12.2015) brought people together who had similar interests in tinkering and taking things apart, and who felt the urge to actually profit from this freedom.
The philosophy of FF as a non-profit organization again provides the possibility to concentrate on these central interests and not lose oneself in contractual clauses of commercial oriented companies. Of course, one needs to invest money in his/her own antenna or router to join the network, but that again gives participants the freedom to install software or buy one's own specific model. Paradoxically, one can find people in FF with completely different views, from very conservative to far left-wing assumptions. Yet, they all still find consensus in creating a network and advocating the benefits of FF's freedom notion.

It is not easy though to initially recognize these benefits. Only a closer look shows the many differences between usual ISPs and FF. Nearly all members think they would miss out on a lot if they were to be simply passive consumers of the Internet and not active users with the ability to control. In many cases people with a technical background detect the benefits immediately, whereas non-techies take much more time to internalize the ideas of the organization. Although the latter often sympathize with freedom issues and the notion of FF

as an alternative, they do not become actual members. The lack of specific technical knowledge prevents them from joining the network. The more technical knowledge you bring, the greater your influence. Being that the fourth hacker ethic rule is to judge hackers only by their hacking ability and not by age, race, etc., FF usually judges its members by their proficiency and craft. Even if it probably happens unconsciously, the majority of FF believe that one should have particular technical knowledge or at least the will and ambition to start the learning process.

FF is an extremely time-consuming organization, though this is not a negative characteristic per se. Many members are pleased with the activities that FF offers. In the same way that hacking does not necessarily need a clear aim or usefulness, FF's activities or discussions can often be aimless. Of central interest for participants are creative and witty projects that are conducted in a playful way. Not only does the fun of learning-by-doing inspire people to spend a great deal of time and resources on FF, but also participation in extremely unusual activities and the exchange of knowledge in a very unconventional manner are motivating factors. Weekly meetings play a highly important role in the collection and distribution of information. There is a fundamental consensus among participants to be helpful, cooperative and show a willingness to share. Heated debates have become very frequent during meetings. Be it fundamental discussions, exchange of views on current politics, or very specific technical disagreements. The unofficial atmosphere thereby encourages even shy and reserved persons to join conversations and discuss various topics. Since there are no sanctions or consequences for showing dissent opinions, people enjoy the freedom of speech and the openness of participants. Although some members complain about numerous conflicts and disagreements, they still appreciate the down-to-earth mode of communication in the group.

Every active member has his or her own strategies for communicating with people who are interested in joining FF. Some show a great deal of patience, take time to explain all the special features of the organization in detail, and illustrate many other questions in a simple manner. They even attempt to give a kind of introductory course for newcomers, people who are struggling with their nodes, or those searching for help. However, a striking feature during the meeting and introductory courses is the fact that some regular guests do not participate or actively help in the organization. The intellectually challenging discussions concerning technical issues are one of many motivating reasons for people to participate in FF without actually being official members. Further, many interested persons are following the development of FF with great excitement. They are fascinated by their engagement and at the

same time deterred by it. The offered freedom of expressing oneself is hence strongly committed to time investment. In this context, FF's slogan makes even more sense: "Our network is free, but not for nothing." So what does it mean to be free? To simplify the answer, it is the ability to take responsibility for one's own actions. Freedom is lost when someone is responsible for you, speaks for you or even acts for you. I will depict the category *responsibility* in detail in the next chapter.

Further, the notion of freedom is not used in relation to hippies. That is to say, from FF's perspective, while the hippie culture defines freedom in terms of being free from any responsibilities, FF distances itself from this meaning. Freedom is expressed for FF through work. However, such work should not be seen as a job or unwanted employment; work means having the freedom to take control of the diverse processes in everyday life. In this sense, FF again follows the ideas of Stallman who propagates that either the user is controlling the software, or the software is controlling the user (URL 12). Besides the software, FF is also controlling the hardware. Physical access to infrastructure offers as much freedom as possible for modification and control.

> "The idea between hacker culture, free software and free networks is in fact the same. It is comparable to inventions, which sometimes come into being at two different places, independent from each other. It has happened many times in the past. But that is a logical step. It is the same idea without the same cause and effect. Instead, people have different ideas with the same fundamental idea. (…) But free networks could probably not exist without free software." (Clemens, 09.02.2016)

As seen in the previous quote, FF treats FS not only with respect, but recognizes the high significance of it for the network's survival. Moreover, the principles of FS allow FF members to play the role of software developers because they are also working on their own software. The enormous advantage of Stallman's freedoms is thereby visible. It is possible for members to adjust routers precisely in line with their ideas and specifications only as a result of having the opportunity to write their own software. As a matter of course, the writing and working process recalls the ethnographies on FS by Christopher Kelty and Gabriella Coleman. It is a dynamic process of experimenting, changing, maintaining and modifying. The existence of own software further increases the control level of the infrastructure as well as the feeling of solidarity and togetherness among participants. FF's notion of freedom is thus strongly connected to property issues. As soon as you are the owner of something, you have the freedom to decide what you want to do with it. In this sense freedom does not mean detaching oneself from all possessions. Instead, FF is trying to acquire as much control over the infrastructure as possible. Nevertheless, it is not a commercial project aiming to buy property, but a community trying to gain as much freedom as achievable by having access to

the physical infrastructure. The idea behind owning infrastructure is not in terms of doing what you want to do with your own property. Rather, despite many conflicts and differences of opinions, the organization follows a clear simple goal: provide free access to the Internet for everyone who is apart of or wants to join the network. Since it is impossible to create a one-person-network, people are accepting compromises in order to stay in the network and reap the already mentioned benefits. Hence, the infrastructure belongs to just one person, but equally to all participants of the organization. And although some people own nodes, they do not understand them as their private property; they are only tools used to join the network.

> "It does not work without communication. Basically, if you have the opportunity to participate, you can do it. If you are living in the center of the city, on the first floor, and without access to a rooftop, it may be difficult. Otherwise, everyone who has the opportunity can participate and contribute to the stability of the network." (I2, 01.02.2016).

One of the main reasons for FF to expand the network is the above-mentioned stability. Beyond this, the network consists of routers and antennas, and also primarily consists of people. Since access to a rooftop is the key element for using the Internet through FF, people need permission from property management. Actually, every lessee has the right to access the rooftop in order to install, e.g. a satellite dish. The property management, however, can be stubborn and prohibit this option. FF members do not involve lawyers in order to solve such conflicts, but search for other people who are thrilled by their philosophy and hope that they will join. It must be noticed though that while they are not actively searching for new members, they are rather open to them.

One can easily recognize the main obstacles of FF's freedom. Firstly, those with a good house location are in a better position. Sometimes house owners with good locations are so fascinated by FF's beliefs and values that they make their rooftops available for node installation. In other cases, people are skeptical about the organization and want to ensure themselves with a warranty, service or usual contract. The funny fact is that FF repairs connection problems for the most part even faster than usual ISP's. The lack of fixed working hours and the feeling that the infrastructure belongs to them, make people more flexible and committed to quickly repair the connection or help with other technical problems. Many people simply want to join FF because of the great Internet speed and connection. One possible balance between a full member and a non member of FF is use of another ISP for tunneling to FF. The first address to report any malfunctions to is the mailing list. The mailing list is certainly the most used tool for communicating with other participants. It is a tool for sharing news, discussing various topics or simply asking for help. In some cases

disagreements via the mailing list can even lead to flame wars: “a heated argument between two individuals that results in those involved posting personal attacks on each other during or instead of debating the topic at hand.” (URL 13). FF’s members usually accept flame wars with humor and entertainment, and do not look at discrepancies as negative because the organization eventually profits from such debates and exchanges of views and ideas.

A second obstacle that holds people back from joining FF is a lack of the readiness to invest a lot of time in the organization. Unfortunately for these people, joining FF is not a one-time thing. Even when one already has a functional node and has taken steps to set up a router in the proper way, one will need to follow the mailing list, communicate with other participants, or attend different meetings in order to be up to date. Thus, while for one group of people this obstacle expresses freedom and is the primary reason for joining FF, for the other group this as an incredible disadvantage. The same applies for the first obstacle. On the one hand, some people consider the requirement of access to a rooftop as a huge disadvantage of the network because one has to take responsibility for the rooftop node or find a way to obtain rooftop access. The other group of people is fascinated by the fact that you have the freedom to physically build the network, despite problems with property management. In their view, it is one’s legal right to install a node on a rooftop, thus there will always be a solution to finding a way to do so.

> “Only very few people can make the first node. I think you need about a half or three-quarters of a year to understand the basics of how to build and operate the node. It is very time-consuming. (…) FunkFeuer is not a single person; FunkFeuer is a bunch of people with different interests. I would say that only the wireless network binds us, nothing else. We share neither the same ideology, nor technology. Only the wireless network. Very few people have fun playing with technology, but I don’t think they are the majority.” (Christian, 14.03.2016).

Despite some disillusioned voices among participants, many still place great hopes in FF and characterize such opinions as cynical. Nevertheless, one has to admit that FF as a matter of fact often fails to motivate newcomers for active participation. A lot of new people are deterred by FF’s conversation manners. In the same way that Coleman depicted hackers as ruled by meritocratic worldviews, FF members do not help beginners by offering a person of contact. In other words, they judge members by their skills and are not trying to integrate or present someone in the group in the classic sense. Discussions do not follow the common structure of introduction, main part, and conclusion. Rather, they are confused, jump from one topic to another, and at the same time aim and avoid head-on collisions and conclusions. It is a process of unstructured productivity. People who want to join discussions raise their voices in order to be heard. The rest of the group though understands this fact as personal freedom

and enjoys not being forced to speak if one does not want to.

Of course, at weekly meetings there is a person to answer questions and give advice, but it is not a person comparable to a professional consultant in a company whose job is to accompany client from the very beginning to the closing of the contract. Thus some beginners are irritated by the disconcerting way of communication among FF members, and cannot identify who is in charge or available to provide advice.

As already illustrated above, FF's notion of freedom is very closely connected to responsibility. Thus, if beginners want to install a node, they should be aware that they must then take responsibility for it. In short, one central motivation for joining the network is the freedom of self-responsibility. There is no need to search for a person in charge; one is in charge of oneself.

4.2) Responsibility

"Emancipate yourselves from mental slavery,
none but ourselves can free our minds!"
Redemption Song, Bob Marley

Freedom and responsibility are intertwined at many points, and it is these points of contact that have led me to make the latter the second category for describing the beliefs and values of FF.

> "I personally can determine how the network will be expanded (...) As an Internet client I do not have the freedom to influence the speed of my connection. I'm completely dependent on what the ISPs are offering me." (Clemens, 08.02.2016).

Since one is personally responsible for his or her own node, there is nobody to blame if it is not working or breaks down. This is why responsibility is actually one of the greatest attractions for those looking to join FF. To live without any contractual clauses, typical restrictions or limitations gives FF's members not only the feeling of freedom, but profound human rights, which in fact everyone should have. The simple non-comprehension of being allowed to change any setting in our home such as the water temperature, but being strictly prohibited from changing any setting relating to the Internet or closed systems in general, has driven FF to establish their own network.

Another factor that is an outgrowth of responsibility is the enjoyment of do-it-yourself (DIY). Most of the time FF's members are not thinking about any ideological or philosophical backgrounds when conducting their activities; they simply enjoy the tinkering processes and the possibility of DIYs. It is probably comparable to musicians who do not want to follow

instructions when playing music. Very popular musicians such as Paul McCartney, John Lennon, Jim Morrison, etc. have written masterpieces without taking musical classes or visiting professional music schools. Today's autodidact or DIY methods are even easier to adapt, since one can find innumerable tutorials, forums or support on the Internet. FF profits from these technological developments immensely. They use not only the mailing list to discuss any questions considering settings, but also use videos, photos, forums and even their own FF Wiki to help each other. Especially the FF Wiki provides interested people or newcomers with information on how to take the first steps into the organization or how to orient themselves in network strategies. FF members often even point out that it is very important to study the FF Wiki before joining the network because newcomers' questions tend to always be the same and are quite repetitive.

Furthermore, acting in a community brings other benefits to everyday life. By having various IT specialists and experts, one always knows whom to approach. So the responsibility aspect should not be looked at from the egocentric perspective; it is rather spread among different community members. Thus FF has created various working groups to discuss specific issues, e.g. IPv6. During these meetings, members try to not harm fellow members who are absent from these working groups: Any new developed software specifications are communicated with other participants either via the mailing list or personally in upcoming meetings.

Nearly all FF members whom I interviewed were fascinated by the idea of having such a large amount of opportunities with an own physical infrastructure, and the privilege of taking responsibility for it. In certain exceptional cases, when someone's behavior does not conform to FF's philosophy, they again try to pacify the conflict without harming the network.

The paradox of the responsibility aspect is that every participant who owns a node takes personal responsibility for it, yet the whole infrastructure belongs to all participants of FF. As one member confirmed in an informal interview (25.01.2016), many activities of FF are based on implied and unexpressed opinions that members of FF blindly share. My questions and presence in the field even bring up issues to reflect on and thoughts, which have not yet been vocalized. By creating all the categories, I attempt to grasp these unuttered understandings among fellow members.

> "Do it yourself. That is the reason that has been motivating people for nearly 30 years to make things different and free in order to free oneself from, e.g. Microsoft Windows. 'We do not want to be controlled by them, let us make Linux!' I hope there will be a time where people start to free themselves from simple online services or mobile communications. (…) I would like to obtain a device or cell phone that is free, but I understand it is a long, long way off. At the moment, we are voluntarily carrying around with us a wiretap of intelligence services." (I6, 18.03.2016).

Responsibility for FF means more than simply a lot of work. It means exercising the right to protest against big corporations or current unfair circumstances. Although FF does not hold visible demonstrations, they do make a "political statement" (Clemens, 07.12.2015) by building infrastructure and expanding the network. Thus, the statement characterizes the unwillingness to be just passive consumers. It further sends the message of capability in that members can do complex technological work without the help of professional companies or services. It clearly indicates the wish to deconstruct common worldviews or to put the initial quote of this chapter by Bob Marley into practice. The simple message though turns out to be highly demanding and compounding. In this case, *mental slavery* to FF means accepting the fact of being impotent to change something or that all people act irresponsible. Since the network consists of actual living human beings, one cannot behave in a selfish and impersonal manner. Existence of the network hence proves to members that social conscience is not a myth, and people can truly act in a responsible way without overseers. That is why one should not understand FF's freedom in the sense of simply doing what he or she wants. Freedom ends when it starts to harm the network or participants. Since the network is based on trust and respect, every node theoretically has the ability to claim more speed, and subsequently harm other connections.

On the technical level, participants often give an example of a crowded room where everyone is speaking with each other. If someone raises his or her voice, other people need to adapt their volume in order to be heard. When everyone raises the volume in such a way that no one can understand each other, the network breaks down. Thus, solidarity with other people not only plays a significant role on an ideological level, but also on a technical level as well. To use more speed or bandwidth than the rest of the organization means to act against social solidarity and against the principles of the network.

> "The mesh network protocol always finds the fastest and the most efficient way. If one node no longer exists, the protocol learns automatically how to create a new way by itself. And that is how Internet works. It's just a single mesh. (…) In the FF case, all nodes are not radio nodes, but self-contained ISPs. So every FF member is a mini ISP and can do whatever he wants. He can give his grandma Internet access. They all communicate trough mesh. (…) As an ISP you gain responsibility." (Aaron, 29.12.2016).

The decentralized principle of the mesh network allows the FF network to in a way be

indestructible. It does not recognize or know national borders and does not have one central place of distribution. If one of the nodes breaks down, the whole network continues to work. Thus, the decentralized principle matches with FF's concept of decentralization and gives further stability to the network on the technical level.

When FF members interpret the first category *freedom* as personal beliefs and values on the abstract level, responsibility has a clear reference to material aspects. It hence regulates visible processes with a very precise goal in mind. It starts with the adjustment of the router in a way that does not harm the stability of the network and ends with avoiding exploitation of the network for selfish purposes. That means one does not use the network for spamming, illegal activities, or commercial interests. In partaking in such activities, one harms their own node and brings the whole FF organization in disrepute. Despite all of illustrated freedom, FF must maintain a good reputation, especially because of the negative representation of the ambiguous definition of hacking in mass media. Responsibility is a multilayered notion that includes thoughtfulness, conscientiousness, respectfulness and most of all self-control. Many mutual understandings among participants are formulated in the so-called FF uses, i.e. the so-called *Pico Peering Agreement* (PPA), to provide smooth collaboration. Agreements such as (1) Free Transit, (2) Open Communication, (3) No Warranty, (4) Terms of Use, and (5) Local Amendments express

> "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" (URL 14).

Nevertheless, the PPA should not be considered as a bureaucratic procedure with many obstacles and provocations. Rather, it is a tool for registering mute and implicit basics on which everyone is in agreement or should necessarily be at least acquainted with. In addition, this measurement is certainly needed to legally secure the organization and to solve conflicts in a forward-thinking way. This agreement, though, should not regiment in any form the freedom of WCNs.

> "We want routers to function in the same good way as others, but you should have the freedom to configure it how YOU want it. And not just two ticks with on and off. But you should have the ability to install your software, to do your settings, especially if you know what you want to do or want to experiment. That does not mean you have to do it, but if you have a desire you should be able to do it. You have, though, no warranty. If you break something, you will need to search for help." (Clemens, 08.02.2016)

However, the dilemma between freedom and responsibility is particularly strong for realizing personal wishes and projects. Many members are expecting to express personal wishes by modifying settings, choosing hardware and adapting the network for personal visions. Then

again, many already mentioned restrictions keep them from focusing on certain schemes and ideas to mortgage FF's future. FF acts as an official organization and is bound by its own statutes. Work in the executive board obligates some members to take part in public relations tasks and to represent the organization to the outside world. In addition, this privilege brings with it extra responsibilities and expectations from users. According to this situation, many members would like to commercialize the FF project with contributions to a common community fund. The creation of FF as the so-called *citizen's network* would mean providing equal pay for equal work. In such moments, concern about the clear ideology of FF becomes a hot issue. Would that mean that FF should become a commercially oriented project with benefits similar to the OS movement? Opinions differ strongly here. On the one side, people are expecting public relations work and a broadening of the network, and on the other side, people are skeptical of such a development. This debate is strongly reminiscent of the disagreement between Stallman and Raymond. Thus, free and/or libre Internet should remain free, but there is no one-size fits all solution.

> "People want to have a free and fast network. Then we need to have many closely linked nodes. That could only work if everybody takes part. That would mean having a free network. If we want to be perceived only as a gratis network without stringent guidelines, then we will not gain many members. If we make ambitious targets to stay free, then we have to build many fast nodes. I do not believe that access should be gratis. I think a free network should be supported with money." (I6, 18.01.2016).

As a matter of course, the skeptics do not share such notions. Expanding the network surely means more speed and stability. But then, concerns arise about actual freedom when participating in the organization. First, FF does not compete with commercially oriented ISPs. That is to say, the relatively small size of the organization based on trust, allows for exploring of different directions and hence provides a strong feeling of flexibility. As soon as FF starts to compete with huge companies, user fear of loosing control over the process increases. Second, openness among participants could disappear and the question of who will acquire responsibility would follow. Reorganization of hierarchies and financial management can further lead to new problems to solve.

By taking into account this ambivalent relation to the 'exempt from charge' access to the network, FF is witnessing the threshold of many future directions the organization could take. Kelty's (2013) provocative statement on the non existence of FS because "Free Software – and its doppelganger open source – is constantly becoming" may also apply to FF and probably even to WCNs as well. Hence, the job is to grasp continuities such as the many dynamic disputes of FF. The "constantly becoming" perspective is for the most part visible through the continuous process of orientation and reorientation. FF members often find it hard

to formulate strict rules, statutes and a philosophy to follow. Nevertheless, nearly all members agree on the need to act responsibly, especially when one wants to save already existing freedoms. While all members were trying hard to formulate an official correct goal of the FF movement, I was trying to grasp the day-to-day activities and find mute commonalities in the form of personal beliefs and values. In this sense, responsibility is more than hidden information between the lines, but quite the opposite – it is a key word that is often used without any definitions or critical reflections. Interestingly enough, it is taken simply for granted on the one hand, but completely unexpected and astonishing on the other hand. In other words, responsibility is certainly assumed in order to join the network, but then again one does not know what to expect.

This feeling of unexpectedness in turn explains the vitality of the organization and is one of the main reasons for FF's attractiveness. In the same way that scientific experiments can show unexpected and surprising results – thus creating excitement – FF's state of uncertainty provides plenty of thrills for its members. Installing new nodes is surely associated with fun, nerve tingling excitement, and sometimes even an adrenaline rush. As most scientific experiments are in a controlled setting with the aim to obtain precise results, FF's role as an experimental network aims in this sense for stability, control, and expansion. Thus, FF unites such paradoxical oppositions such as control-freedom, fun-responsibility, anonymity-openness, and dependence-independence. These oppositions are not only strongly interwoven, but cannot exist without each other. When the notion of freedom was the enjoyment of the ability to control soft- and hardware, responsibility had a highly positive connotation because it is simply fun to be responsible for one's own network. In fact, hacker collectives teach responsibility, open closed doors, and always search for a way to solve problems, e.g. by maintaining devices in order to avoid buying new ones. Viewed from this perspective, media technologies are more than pure communication tools. They are rather something that can be adjusted to one's personal beliefs and values.

> "Can I adapt a hammer to my personal beliefs and values? Can I put personal beliefs and values into technology? That would be a highly interesting topic to discuss. It is technology in principle. Technology can only be an aid to solve social problems or questions. Technology can speed certain social problems up or hold them up. But it cannot solve problems on it's own. (…) The question is in what direction should we develop technology? Do we want to bring technology forward in order to make war or in order to make social integration possible? (…) That is why technology should not be treated without the link to our social questions." (I3, 08.02.2016).

Tech-savvy members of FF are convinced that technology is neither mysterious nor incomprehensible, and also not an uncontrollable media tool. They truly recognize the undeniable link between on- and offline environments. To learn technological know-how,

programming or engineering is considered a process of learning a trade. A master of his trade can modify not only the whole network, but also influence the future of technology development. The results of programming as crafting can be seen in their everyday life. New settings and configurations change the stability and functioning of the network. Thus, the decision to write own software for routers exemplifies the willingness to shape and adjust the network as much as possible to the user's wishes. They often articulate the view that technology is neutral per se. That is to say that, e.g. a knife can be used to slice bread or unfortunately kill. However, one should not conclude the prohibition of the access to knives as a solution, but rather learn how to take responsibility for actions and to discuss or reflect ones goals and values.

Nevertheless, FF members are not fundamentalists with regard to the use of closed systems. They are against turning FS or OS thinking into a religion. Many participants use, e.g. Microsoft or Apple products without the fear of being treated differently. Interest in technology drives them often beyond ideological debates. Moreover, they see it as a thrilling challenge to explore new possibilities concerning new achievements in the world of technology. Although iPhones or Macbooks do not follow the philosophy of FS, they protect the user with better security than many other analogs. In this case, people frequently speak of choosing the lesser evil. As long as you are using products from one company, you are less vulnerable than when using many different operational systems. It does make sense, e.g. to own an iPhone and Macbook at the same time because they are compatible with each other. However, it is also possible to install Linux on Apple computers. Thus, in contrast to various activists, FF tries to look at technology in a sober and rational way. In other words, one should have the freedom to decide what technology he or she wants to use, particularly when choosing hardware for installing FF nodes. The only necessary condition is, of course, the applicability of this hardware to the network. Topics related to such decisions are regularly discussed on the FF Wiki or in mailing lists.

Despite hard decisions in choosing appropriate hardware and lack of official support services, FF members do not feel abandoned by the community when having difficulties in such processes. In the end, mutual support holds the organization together. This also applies to FF's server housing, a non-profit project that covers only operating costs. To manage this task, members are required not only to assume responsibility for administering the servers, but also to manage the costs for such resources as bandwidth, power or infrastructure. Since FF does not record working hours, volunteers need to find other ways to organize and solve any upcoming problems. The benefit of assuming responsibility for the network makes it

possible to be flexible and manage various technical issues in a fast and proficient way. In this sense, the volunteering aspect means more than simply helping without financial gain, but instead as a matter of course to have the right to provide help to something that belongs to you either way. Furthermore, the management of such tasks demonstrates elements of being unique and irreplaceable. To put it differently, invested time in the FF organization is not impersonal and also not taken for granted. It is evident that in contrast to usual ISPs, the importance and hence contribution of the user shapes the network in a profound manner. Unlike in other ISPs, Internet access is only possible because of the actual members who are participating in the organization. Consequently, FF can only exist as long as people feel confident to act as a community and spend much time maintaining the infrastructure.

Figure 3: FF's stickers

Following Tom Boellstorff (2002: 1) the senselessness of putting *real* over the *virtual* is in this context self-evident. FF can be seen as a prime example where the *virtual* would not exist without the *real*. FF's activity in cyberspace is only possible because of *real* members in the organization. Since each full member with a node acts as an ISP, the line between this opposition blurs even more. The prompt association of the Internet with physical infrastructure gives them a feeling of power over this nontransparent and ramified tool. Further, the anthropological theoretical perspective to media technologies as material culture

can be exemplified by this actual access to the physical infrastructure of the Internet. All actual components of the Internet are natural parts of their everyday lives. Specific models of hardware can even cause emotional bonds and occasionally nostalgic memories. The everyday use of media technologies often leads to a desire for personalization. The many Linux users adjust and personalize software and/or operational systems for their very special wishes. In addition, stickers are used to even more personalize various devices such as routers, notebooks or cell phones. Besides using FF's stickers, members often use stickers that correspond with their beliefs and values. Since metalab is a hacker space with many different organizations, they often exchange different stickers among each other. Some stickers are very personal and unique, for they are either not commercially available or use rare insider jokes (representing the already discussed hacker humor).

The process of personalizing the many devices FF needs to have a stable network shows the personal relationship to the infrastructure. The infrastructure has a face that resembles the many faces of FF participants. That is why they not only assume responsibility for the network on the technological level, but also for the people behind it. The relationship between the actual world and the virtual is a very personal letter in this context. Urges to be responsible, and maintain or repair the infrastructure are not motivated simply by the desire to make technology work on its own. In fact, the primarily goal is to provide a functioning infrastructure to the people behind it, i.e. people who are using it or will use it in the future. In short, all the time invested, engagement and willingness to provide help to the network comes from actual *real* people who are participating in the FF community.

The briefly mentioned opposition represented by dependence-independence results understandably from a discussion on responsibility. When everyone is prepared to assume responsibility for one's own node and waive all rights and claims of usual ISPs, does it mean that one has gained more independence?

4.3) Independence

"For the things we have to learn before we can do them,
we learn by doing them, e.g., men become builders by building (...)."
Aristotle

What is the aim of those trying to be independent, and more importantly, what or from whom is FF seeking independence? I suggest that the best way to illustrate the notion of the independence of FF is to demonstrate the lifestyle of one of its members.

Christian, a long-term and extremely active member of FF, has shown his desire to become as independent from everything as possible. He lives with his family in a small village in Austria and dreams of a subsistence economy in his household. He grows his own vegetables, drinks and uses water from his own well, maintains a self-contained power supply, and drives an electric car. FF gives him the opportunity to participate in the world of modern technologies and use the Internet, but still not lose his ideas and philosophy of independency.

> "I joined FunkFeuer four or five years ago with the idea to minimize my dependency on commercial infrastructure. I do not believe that commercial service providers can provide accurate and gapless infrastructure, e.g. one experiences many power failures particularly in the countryside as a result of catastrophes such as flood waters, bad weather, etc. These failures happen only because of the centralized principle of the infrastructure, i.e. the nodes can easily fail. This applies pretty much to the Internet as well." (Christian, 14.03.2016).

The key word *independence* motivates Christian to think critically about many aspects of his everyday life. While many hackers find it amusing to explore ways to bypass restrictions, he is amused with the challenge of figuring out how to avoid many mundane enforcements such as using commercial ISPs. *Freedom* and *responsibility*, the two illustrated personal beliefs and values, increase Christian's awareness of the actions, thoughts, and plans in his everyday life. This never-ending process of new discoveries and the search for new solutions make his life vital, funny and ingenious. He is not an activist trying to break down the concepts of national state or capitalistic oriented companies, but believes instead that the way of life he has chosen simply fits his thinking and worldview, and it makes him happy. A summary of his worldview would probably involve two main points: constantly asking *why,* and *what can I do about it.* The essential aspect thereby is to think in a humorous way. In contrast to many other groups who think critically about capitalism and neo-liberal constructions, and choose radical ways to express their demands, Christian implements his strategy only to his own single case. He does not follow grand theories for changing the whole world or concepts for changing the political or economic system in general, but instead follows certain personal beliefs on how his own life should look.

Nonetheless, he has yet to manage the independent way of life he desires in regard to Internet access. In fact, he considers himself actually even more dependent, since he does not have the possibility to obtain access with an own node, but instead has to use a tunnel to create a connection to the FF network.

> "I am dependent on an Internet Service Provider and FunkFeuer! In this context, that is not what I wanted actually (laughs). (…) But FunkFeuer has no data preservation. That is why I use it for my traffic. I am not doing something bad on the Internet. I'm simply afraid that my identity can be stolen and abused. I simply trust the people here, I know them personally." (Christian, 14.03.2016).

At this point the opposition dependence-independence becomes especially clear. The independent character of FF helps its members to decide, build or adapt the network to their wishes. Then again, all members are dependent on the infrastructure of the network. Besides the issue of trust (to be depicted in a further chapter), FF members have many other reasons to still feel independent.

When Christian tries to establish a subsistence economy or his water and power supply, he is attempting to escape from the mainstream which is built upon a centralized principle. He is surely completely dependent on nature when growing his own food or uses water from his own well. He accepts the fact that there are aspects, which he cannot influence or change. To compromise is consequently the only rational solution for him. First, despite the limits of being independent, which he naturally realizes, one can aim for minimization of dependence. As in Gabriella Coleman's appeal to join imperfect activism (Coleman 2015: 402) instead of political inaction, Christian and other members rather join imperfect WCN with minimization of dependence, instead of relying wholeheartedly on other well known services. Second, the ability to modify the network gives reason to hope for possible changes in the future. Usual ISPs are seen as static, difficult to control and bound by many strict rules. The expansion of the FF network may someday give Christian the ability to become a full member with full access to the infrastructure. Contrary to these conditions, usual ISPs show little amount of hope for any policy changes.

The ambivalent notion of independence is visible throughout the entire organization's history. Some members articulate the view that maximization of the complexity and variety in technical settings increases the amount of independence. Impenetrability of the structure for outsiders as well as principles of decentralization makes acquisition difficult for anyone trying to take over control. The network becomes independent itself only by proper adjustment. The decentralized principle of the mesh network protocol makes it difficult to destroy Internet access. Even if some important uplinks and nodes were to be destroyed, the network could still exist in the form of the intranet. Thus independent existence of the FF network impresses members to speak of certain freedoms and independence in the organization.

Others in turn do not share this view and prefer minimization of complexity in order to reach new potential members. The network cannot be independent a priori because it is bound to the infrastructure. FF should hence develop new simple strategies to facilitate the accession

of new members. This recurrent discussion of complex vs. simple affects therefore the *independence* category as well.

> "FunkFeuer is a network of specialists for specialists. You need to have a lot of endurance. You will be in a better position if you go to an ISP and buy a stick for 15 €. FF involves a great deal of work. You will try to get to know the organization, the people, and the key players. Then you will try to find a common language. It is not as simple as it might appear at first sight. And you will need to develop a certain stubbornness in order to make yourself interesting. Then they will help you." (Christian, 14.03.2016).

Consequently, one is more than just dependent on the infrastructure, but also on the people behind it. When illustrating the simplicity of a usual ISP, people paradoxically often emphasize the independence of it, i.e. you are not bound to the decisions of other people and do not need others to establish Internet access. Moreover, you have the right to complain if something does not work properly, and further obtain many other customer rights. So why do FF members think they are more independent?

A main counterargument is that having rights from use of commercial ISPs works only on the theoretical level, but this is unfortunately not true in practice. ISPs contracts are in fact non transparent and do not protect the customer as they are intended to. From FF's perspective it is sham independence because one simply gives, under voluntary termination, his or her rights away. Independence again goes hand in hand with the ideas of DIY. That is why being independent or free means being responsible for one's own actions. As one can see, all these categories are very interconnected and related to each other. By gaining the feeling of freedom and responsibility, members consequently obtain the feeling of independence. It is particularly curious to note that individuals interested in FF are usually much more critical of politics, government, capitalism, etc. than actual FF members. Often I have noticed that potential members are fed up with everything and trying to find like-minded persons in FF. Yet, in contrast, the majority of FF's participants do not claim to be engaged in lobbyism, activism or support any political party. Hence they usually respond to those who are interested, but fed-up-with-the-system, in a down-to-earth and unemotional manner. Nevertheless, FF supports data protection and privacy, net neutrality and other net political demands (to be described in detail in the category *net neutrality)*.

Although FF avoids speaking of politics and approaches such topics in a very careful manner, they are aware that participating in an organization that claims to be free or independent can also be seen from a political perspective. Many individuals interested in FF use only this perspective as motivation to join FF. Disappointment increases even more when they hear about disputes among participants, which can easily remind them of political

activities. Christian formulated very appropriately that one should find out the key players in order to make progress with an installation. Newcomers do not like this idea, which contradicts for them the main principles of WCN. In other words, how can someone claim to be free and independent, but have a system based on authorities? First, nearly all members treat the "fathers" of FF with respect, although they are not privileged.

> "I would compare FF to the wiki principle. Many people are working on the same idea. (…) I think activism is important, but one can only focus on one thing. (…) It does make sense to share something as Free Software, Open Source or Open Network. It is a win-win situation for all participants; the political system does not really matter here." (Aaron, 29.12.2016)

Since the network is built on the idea of a win-win situation for everyone, the "fathers" of FF benefit as much as other participants in the organization. Key players are people with specific tasks, knowledge and information. The longer one participates in the organization the more knowledge and better social status one obtains. This obvious link though might appear shocking at first sight because many people are searching for an organization without hierarchies. Hacker collectives are often stereotyped for being anarchistic and against any rules and norms. Although one of the ethics of hackers involves mistrusting authorities, FF members do not describe themselves as following a certain anarchistic ideology. They even criticize the term for its inflationary use in mass media and see many limits in this political philosophy. It can be exemplified by the fact that anarchism can be pretty much capitalistic in the economic sense with regard to the idea of free market. The completely uncontrolled free market system can be described as anarchistic.

On these grounds, freedom as well as independence needs forms of regulation or control. FF does not sympathize with any political form or philosophy, but shows sympathies to alternative concepts of thinking. While debates on the pros and cons of anarchism or any other social movements do occur, debates on the pros and cons of ruling parties, famous politicians, current news and so forth are not present. FF is a platform for alternative ideas and independent thinking. In this context, independent can be simply defined as different to the mainstream. A parallel can be drawn with the notion of independent music, independent films or independent video games. They all follow the idea of DIY without financial support from major commercial companies. In this framework, being independent means following two paths. First and foremost, one must waive all financial support from big corporations and other entities in order to secure the free aspects of the network. As a result, one has the freedom to put the ideas of DIY into practice. This profound notion of independence in the financial sense is the engine that drives members to participate in the first place. Despite

many other dependencies, such as infrastructure, actual people or the organization's rules of behavior, this crucial financial aspect makes all personal beliefs and values possible. The competition between independent and traditional or the competition between the bazaar model and cathedral model stimulates FF to maintain the network. The self-perception of oneself as a member of an independent collective fascinates many individuals who are interested in joining FF. Coleman's (2013: 120) depiction of hackers as cognoscenti who create the bleeding edge of technology and represent elitism also echoes in the motivation to join FF. The manageable amount of the organization and the existence of the personal level make participation compelling for newcomers.

The notion of being independent is strongly interwoven with the notion of being outnumbered. Some interlocutors argue that the freedom of FS or some Linux distributions is only possible because of the small amount of its users. Big corporations do not see developers and users of such small communities as competitors. As soon as these small groups invade their power sphere, big corporations will act in an impudent way to win the competition and put all rivals out of the market. Following this logic, FF will lose certain freedom in the form of data protection, flexibility, or experimentation spirit, etc., as soon as it starts to compete with official or commercial ISP. Nonetheless, many FF members do not believe that expansion of the network would mean the loss of any freedom and rights. The challenge should be to establish a strategy, which does not accept centralization or any other forms of assumption of power. Moreover, as one can recently recognize, big corporations such as Apple or Microsoft frequently try to implement FS ideas by providing new operation systems as gratis downloads or demand encryption as a basic human right. Further progress can be seen in environmental issues, when big corporations again promote environmental protection due to customer's demands. Customers consequently have the power to initiate a change in direction. Although big corporations probably cannot satisfy all wish lists, they surely can react to major customer's voices and put ideas, such as being environmentally friendly or protecting private data, into practice. Thus many activists point out that users, customers or citizens have the real power over big corporations or the government and not the other way around. They still would not be fully satisfied with the reactions of big corporations, but would be happy to see a success.

Nonetheless, FF does not try to convince other ISPs to adopt its ideas, and believes that even with high participation, FF would not lose its independence or freedom. It would be difficult to realize the project for everyone in Austria or even Vienna, but not impossible. The expansion of the network is the only possible way to change the current Internet status.

Original principles of the Internet in general comply with the personal beliefs and values of FF, mainly to build a network, to cooperate with each other, and not discriminate per se.

> "There is a major difference between mobile phone technology and Internet technology. Mobile phone technology is extremely hierarchical. Whereas Internet technology is very collective. This comes from the idea that universities joined together to cooperate with each other." (Clemens, 08.02.2016)

FF members do not see their task as reinventing the Internet or finding solutions to problems of humankind; instead they view their mission as simply using all the innumerable possibilities provided by the principles of the Internet. The notion of independence allows understanding of the network as a perfect technical playground with plenty of possibilities for cooperation. One should save the non-hierarchical principle of the Internet in order to allow oneself room for creativity.

> "There are people who have a say in the technical area. There are people who have a say in the social area. Maybe there some professional hierarchies, but they are not lived out in practice. The background does not matter; it does not matter where you are from. They are listening to each other. In a hierarchical system, it would harm the network if you would take out a node. If you take a person out from our system, it would be very sad, but the system would continue to work because of the mesh principle." (Christian, 14.03.2016)

Again, one can at the same time see the paradoxical existence of dependence and independence. The organization needs a great deal of enthusiasts who will spend their leisure time building and maintaining infrastructure. Many interested persons with excellent locations even introduce a condition that they can provide access to a rooftop, but do not have the time to take any responsibility for it. The FF network relies on help from its members. In fact, nearly all members support learning of technical know-how for newcomers, since without such knowledge the network would be dead. Key players of FF manage to uphold the functionality of Internet access for all participants.

On the other hand, the illustrated principle of mesh network protocol makes it possible for the network to work independently.

> " (…) network nodes can "talk" directly to each other without requiring the assistance of an Internet connection. A big advantage of this decentralized topology is that there cannot be a single point of failure. If one node can no longer operate, the others can still communicate with each other, directly or through one or more intermediate nodes." (URL 15).

Beyond a doubt, the cause-effect relationship of the use of this protocol is a question to discuss. When some members make it clear that this protocol was the reason for development of the personal beliefs and values of FF, the others articulate the view that it was the other way around. Personal beliefs and values motivated the creation and use of the mesh network

protocol. Without specifying both of these views (the use of media technologies will be discussed in the fifth chapter), the opposition of dependence-independence concerns most participants. In the majority of cases, the accentuation of independence, however, wins the discussion of both these terms.

Instead of formulating political directions, FF rather prefers to speak about very specific ideas. Independence should bring equal rights to all users on the technical and social level. Although this vision might be utopian and idealistic (URL 16), the aim to gain equal status for all Internet users plays a significant role in the construction of FF's personal beliefs and values. Equality also means sustainability in the broadest sense. As the British equivalent Consume has shown, the network should avoid dependence on some key players or even worse very few technical experts. As soon as the founders of the British WCN Consume withdrew from the network, it collapsed. Thus centralization creates a network built on a certain few members and cannot survive if these important enthusiasts quit. That is why one of the major tasks of FF is to build an independent and sustainable network that treats all its members equally. Only if all members have the same access to information, are treated equally and have the same power as others, will the infrastructure survive different losses and withdrawal of participants. The notion of independence is strongly interwoven with replaceability. Although interpersonal relationships are highly important for FF members, they build the physical infrastructure with the idea of sustainability in mind. Among many other benefits, the bazaar model by Raymond benefits from flexibility due to work-sharing processes. Since technical know-how is available in open access, everyone has the opportunity to get involved in the maintenance of the infrastructure. FF is not an organization led by a single person according to his or her visions. One might exaggerate and quote the slogan of Anonymous "you can't arrest an idea." (Coleman 2014: 16). In contrast to Anonymous, FF does not have any illegal or criminal activities, but what counts is the idea and not certain persons behind the notion. In this context equality also means accepting the fact that one will not win fame by building nodes or volunteering for the organization. It is therefore an extremely difficult task to motivate people to participate without any financial support or at least recognition from the outside world. Equality can only be an acceptable motivation when the idea always has the highest priority.

> "It was not about myself. I was driven by the idea. Anonymous, as their name suggests, is about being anonymous. I instead use my official name when I give interviews or write something. Of course that is something that people did not like in the past, but now it is not a problem anymore I think. Everyone understands that FunkFeuer is not about this or that person." (Aaron, 29.12.2015).

Further, to join Anonymous one does not necessarily have to be a hacker, and one can also join FF without a hacker background. Although nearly everyone would share the notion that the idea is more important than certain persons, it is definitely more than simply "the network belongs to us." There are no protest movements or activism comparable to Anonymous, but there is a recognizable "social drive" (Aaron, 29.12.2015). People do believe that the idea of FF is realizable. They also believe that FF is more than just an organization. Nearly all interlocutors were using terms such as community, movement, bunch of people, or project and avoided speaking of an organization. In fact, many members understand the organization as a must, not as a choice. Some even complained that the form of organization brought many problems and restrictions. Motivation, spirit or drive descended as soon as those "bunch of people" were officially registered and bureaucratic procedures began. Enthusiasm for those days in the early stages motivates founders and "old" members in the present day. They remember these past times as having a euphoric mood. Suddenly things were possible that were previously forbidden. Building FF provided a feeling of freedom and independence. Members enjoyed the sense of participation in a process that would someday become a huge success.

According to the founders, no one was really thinking about formulating any type ideology back in those days. There was a buzz for creating, experimenting and building something new. One has to accept though the fact that FF has changed many times over the years, but is still more than a conventional organization with statutes. Despite some illustrated protesting voices (as discussed previously) against the "old course", FF remains gratis and describes itself as an experimental network. Many members have changed everyday habits such as purchasing behavior or analyzing mass media information because of interaction with completely different people in FF and/or metalab. Often members start to develop theories to explain current circumstances and discuss them with other participants. Strong sympathies for many other activists sometimes lead to new information and perspectives.

Nonetheless, FF distances itself from any form of political activism, but still supports ideas which conform to their values. According to Clemens (08.02.2016), activism means not only a large amount of public work, but also lobbying, though not in the negative sense of the term. However, when one is searching for independency as FF does, one either simply sympathizes with activists or keeps away from all things political in order to do what one really wants to do: build an own physical network.

Figure 4: Building process of a FF node

4.4) Anonymity

"Those who surrender freedom for security will not have,
nor do they deserve, either one."
Benjamin Franklin

Ambivalent perception of anonymity (briefly touched upon in the following chapter), is very often a central issue of discussion during FF meetings. In most cases anonymity is strongly related to data protection and encryption. Many FF members attend network political events or so-called CryptoParties in Vienna (I have visited both for ethnographic fieldwork) to inform themselves on current situations and talk to other hackers. Data protection is perceived as one of the most profound human rights. It became a serious topic when the former NSA and CIA director Michael Hayden officially stated that people are actually killed simply based on metadata (Schneier 2015: 22). Before such statements and Snowden's global surveillance disclosures, many FF members were skeptical about surveillance processes and the governmental scale of unwarranted intrusion into the private sphere. Some were convinced it was technically not feasible to undergo such elaborate operations. It was a moment of shock even for the "real" techies among the participants, since they were relying on knowledge based on discussions with other technical experts. Today, they are all in agreement that anonymity on the Internet is simply impossible. If data privacy is a primary concern, one must keep away from the Internet and any media technologies. But is it nowadays even possible to live without a credit card? One of the conversational partners refuses to use online banking and any other forms of payment via the Internet. From his point of view, one should theoretically have the freedom to be employed without a bankcard.

The only solution is to minimize coordinate data collection and spread personal data over the Internet as much as possible without perceivable logic. To achieve this goal one should reflect on his or her online presence and use the Internet with the idea in mind that it remembers everything. Chaotic and unorganized online behavior makes it harder to track every step. FF members do not accept arguments such as *I have nothing to hide.* They are in agreement with the Austrian privacy activist and founder of *Europe v Facebook*, Max Schrems, who remarked that basically everyone needs privacy or has something to hide. You certainly would not allow open access to all of your e-mails or be happy about having your last sexual activity plastered on the front page of the daily newspaper. Moreover, he criticizes the transparent rule because it works only in one direction. Trade secret protections safeguard the privacy of corporations, e.g. Amazon, Facebook etc., and citizens are not allowed to know the algorithms behind user data collection. Professional and powerful lawyers protect these

corporations, whereas "normal" citizens remain unprotected and should accept tracking or spying. Moreover, governments and corporations often cooperate with each other in a non-transparent manner (Schrems 2014: 87-89). These undemocratic procedures have led him to lawsuits up to the Court of Justice of the European Union. Edward Snowden aptly stated the following:

> "When you say I don't care about the right to privacy because I have nothing to hide, that is no different than saying you don't care about freedom of speech because I have nothing to say." (URL 17).

Although FF certainly sympathizes with Internet activists, it does not see the future of the organization in demonstrations or lobbying. Sympathy is rather expressed by attending hacker conferences, parties or network political events. FF's help is usually more on the material, technical level and not on the theoretical. Members frequently offer help with infrastructure, Internet access or even server housing. While the organization follows many debates with great interest, it does not actively participate in any protests or lawsuits. The lack of active public work is often justified by the lack of professionalism in talking or presenting. Many FF members classify themselves ironically as nerds without proficient social skills.

> "It makes me really sad that we have barely any women in our organization. I think we would behave differently. I simply believe that men act differently in the presence of women, more friendly. That would probably change our appearance for the better. We would not be that nerdy anymore. And that would probably not be a bad scenario." (Christian, 14.03.2016)

Members even sometimes wish that the organization had a non-techie person for representation of the organization to the outside world. As an example, from FF's view, the Austrian net neutrality activist Thomas Lohninger – with whom I have done an interview with in the *net neutrality* chapter – manages to speak to a broad non-technical audience on technical issues in a formidable and compelling manner. FF members are searching for a reason for why the level of participants has stagnated. Among many hypothetical reasons, they perceive constructing of a link between the technical and non-technical world as an extremely difficult and unmanageable task. However, professional activists can speak more like politicians and cast a spell over an audience. Despite the desire for public work and serious representation to the outside, FF members do not like people who are trying to become leaders of the organization. The already illustrated significance of the idea of FF and not certain participants behind it makes popularization even more difficult and paradox. On the one hand, one of the main tasks of FF is to extend the physical infrastructure by gaining more members. They search for a way to reach more people and make the organization attractive to everyone. In addition to a mailing list and the FF website, the association

maintains social media accounts on Twitter, Facebook, etc. and regularly posts various information concerning WCNs. It might look as if FF wants to motivate people to join and are enthusiastic about new members.

On the other hand, FF appears anonymous because interested persons do not understand who speaks for the group. Thus, despite the many relations between the categories of personal beliefs and values, the category *anonymity* stands in opposition to the previous categories of *freedom, responsibility* and *independence.* Being anonymous gives the feeling of not being obligated to take responsibility for one's actions. When *freedom* is mostly expressed by the ability to have responsibility and independence, *anonymity* means having the right to simply observe without participation. Who will act as the speaker or leader of the organization? Further, since there is no unanimity among the members, what content should the speaker or leader present?

The current organization's structure makes it impossible to reach an agreement in one specific direction. Even when some participants start to push FF into the media sphere, they very soon earn criticism from other participants. The completely different notions, definitions, and future visions of and within the network strongly divide members. Anonymity is hence debated on very contrasting levels. First, focus on a user's identity on the Internet drives people to deal with encryption software and study alternatives for more data protection instead of using common closed programs. FF supports the anonymity network Tor, a FS that tries to counter global surveillance. Since WCNs cannot provide anonymity on the Internet, they help other associations and organizations that particularly specialize on this topic.

Second, the probably most popular slogan from FF *we are the network* or *we are the infrastructure* makes the *we* appear anonymous. *We* is not connected to a specific group of people or anyone personally behind the infrastructure. In this context, *we* are simply all members and users of the FF network. It presents neither a certain face nor hides behind a Guy Fawkes mask. Although some key players as founders and very active members use their official names for interviews and publications, the majority appear anonymous to the outside world.

Finally, the total lack of anonymity within the network itself gives people a feeling of being in a like-minded community. Official names are not relevant here and many members use pseudonyms. Looking only at the notion of anonymity from this perspective makes personal beliefs and values completely irrelevant. In fact, people even enjoy the freedom of being non anonymous within the organization.

> "It is not necessary to know everyone in person. But, in contrast to Freifunk in Germany, we said here in Vienna 'ok, you want a public IP address. Then you have a certain responsibility. That means we would like to meet you in person, you have to introduce yourself, to explain why.' Of course you could bring forged documents, but you certainly cannot join FunkFeuer without speaking with us in person. (…) The goal was to say: you can do whatever you want with your node. But certain rights mean responsibility. And then it was a huge discussion on being anonymous or not anonymous. We have chosen to not be anonymous and I am happy with this decision because now we are a social network as well." (Aaron, 29.12.2015).

Although FF members prefer to make jokes about being stereotyped as antisocial nerds and geeks, they do not confirm the cliché of the single, introvert person, who programs without sleep, food or self-grooming. One surely can find members who probably in a way fit this cliché, but being a network with a strong focus on interpersonal relationships makes the majority rather communicative than antisocial. One cannot simply avoid social interactions when the goal of the network is to build physical infrastructure. Most of all, when programming requires computer access, FF needs much more media technologies to realize such a project. To be isolated from offline activities would further mean having noticeable drawbacks in decision-making processes. Important news, information and decisions are usually discussed in meeting and interpersonal conversations. To be absent from all meetings, talks and parties would mean not really being up-to-date.

Thus in contrast to other hacker collectives, FF members interact rather offline than via online services. Further, cell phones are used as communication tools by a great deal of members. Interpersonal relationships that have evolved over time have resulted in the establishing of new friendships and even the finding of partners to start a new company or project. The casual and easygoing atmosphere of meetings or working processes is an excellent platform for meeting new people from different branches and areas so as to develop and realize new ideas outside the organization. In this sense FF plays a fascinating role in the exchanging of knowledge. Moreover, the informal atmosphere is a formidable way to obtain help, advice and recommendations from technical experts. One should not simply exploit such help and other benefits; rather the tone of these meetings is exchange. However it can be problematic if one is unable to contribute due to poor knowledge in certain technical areas. But since the exchange does not have to be particularly in a technical area, in the majority of cases people always find topics on which they can exchange ideas or knowledge.

However, the more technical knowledge someone has, the faster he or she will find topics of conversation and acceptance within the organization. Knowledge exchange is thereby also based on an anonymous principle. The briefly addressed similarity of FF to the principle of Wikipedia and other wiki-based websites is once again visible here. The purpose

is to change content collaboratively in order to share experience and knowledge with the reader. Hardly anyone can name a single contributor of a wiki-based article. But who are the people behind, e.g. Wikipedia, a website ranked in the top 10 of all websites in the world? (URL 18). People cannot name contributors or even the founders not because they are ignorant, but because it is not the main goal of wiki-based websites. In the foreground is the exchange of knowledge and information, and not the authorship of particular persons. This strategy has proven very effective in reaching a high level of participation and reader interest. The information of course does not have the reliable seriousness of scientific publications or professional validity. At the same time, it has the freedom and flexibility to change and address all relevant topics tackled from various angles. The principle of wiki-based websites is against censorship and centralization. FF Wiki's liveliness is, e.g. expressed by the ability to change articles, add information, and update news in a decentralized way. One does not need to know all contributors by name; what counts is the output.

As Gerhard stated in an interview (04.01.2016), FF follows the slogan of the Germany-based Chaos Computer Club (CCC): "Use public data, protect private data" (Ger.: Öffentliche Daten nützen, private Daten schützen). FF maintains close contact to the CCC, the largest organization of hackers in Europe. For some FF members it is important to not miss Europe's biggest annual hacker events, and members and participants stay in contact outside of these gatherings or join CCC's meeting in Austria. Public data should be transparent and open to everyone. Especially the government should respect the voter and protect its citizens. However, the private data of each individual should remain private and not abused. Various commercial projects such as Google's StreetView could not only harm individuals, but also result in a loss of control over the massive amount of collected data. Today's motto of *gather as much data as possible* makes data privacy activists criticize current net politics even more. From their point of view, this model should be turned upside down. Although members of FF do not criticize this fact in a radical manner, they certainly share the basic ideas of this popular CCC slogan. FF cannot protect private data on the technological level nor via lawsuits. The only way to implement this view into practice is to support such projects by providing them help or infrastructure.

> "The benefit of communities is that you know what other people are doing. It is very easy to ask someone: hey, do you know something about this? I am working on this and cannot figure out what to do next. Hacker spaces and metalab are the same. If you are working on something, you can ask someone. Even if the person does not know how to help, if he has interest or is bored, he will search the Internet for answers and work with you together on this. This mutual support comes from Free Software. Does not matter what you are doing. Building a network, making a hacker space or developing Free Software. I think these are the actual roots of Free Software." (Clemens, 08.02.2016).

Such an uncomplicated way of working and helping each other in also based on the faceless principle. Most FS or Linux advocates use online forums to discuss various topics, to find answers or solve problems. Support is not bound to certain names; it is rather a platform for sharing knowledge, updates and information without considering further effort unnecessary. When work is usually associated with financial profits, this work has a different notion. It is an activity, which does not need motivation such as financial incentive. The unchallenged spirit for hacking, developing, programming or building is a prerequisite for having fun. One does not necessarily have to work on something specific. Very often people simply enjoy hanging out in the hackerspace or in forums and on websites because the opportunity to discover something new is always present. The urge to explore is responsible for the vivid and lively atmosphere found in hackerspaces. Though, from time to time it might look pretty quite from the outside, as the computer is still the most popular form of technology used by hackers. The main action happens in cyberspace and on laptop screens.

This contagious working atmosphere opens up the floor for creativity, the setting up of new projects and the establishing of contacts. Usually hacker acquaintances do not follow a traditional conversational tone. Often people know only the pseudonyms and professional skills of those they have met in such spheres. They respect individual privacy and do not question another person's clothing, eating habits, taste or daily rhythm. Unordinary daily rhythms or unconventional working strategies are even seen with great curiosity because hackers are not pleased by routine jobs and are constantly searching for new inputs. While poets, musicians and artists are waiting for inspiration and blessings from the muse herself, hackers are simply trying to bring technology to work in the most efficient way. However, "one of the clearest expressions of technology/software as art is when source code is written as poetry, or alternatively when poetry is written in source code." (Coleman 2013: 13).

Current debates in the news and mass media on the danger of encryption in terms of criminals capitalizing on it for nefarious purposes has of course affected FF. Although FF has never been confronted with criminality or any illegal activities, many individuals who express interest in FF ask members for advice and also about their opinion and position on this topic. What if someone was to misuse the network for own unwanted purposes? The current migrant crisis has brought the topic of data protection and surveillance even more into the spotlight. Widespread uncertainty spread through mass media has caused many to react in an extremely negative way to data protection advocates. They believe that governmental control and surveillance would bring more security for citizens. Fear is increasing of parallel societies capable of abusing the protection of private data in order to harm innocent people.

Discussions on these topics are usually emotionally charged.

> "Anonymity is a sensitive issue right now. We cannot reach the anonymity level of Tor on a technical level. I am not quite sure though if it is worth striving for. Unfortunately people misuse the Tor network. The principles of freedom of speech are used to spam, for instance. We really need to think about if we really want to support this abusive behavior because we cannot say that our *freedom of speech* is when everyone is doing whatever he or she wants. Anonymity is surely necessary, but for what purposes. If I use the access node to surf anonymously or to send information to a newspaper, well these activities are completely different from making nonsense." (I6, 18.01.2016)

During my research period the Austrian government adopted the controversial State Protection Act which has been perceived very negatively in the hacker scene and especially by activist Thomas Lohninger. According to this Act, Austrian's citizens could lose basic profound rights to privacy. Among many important facets, Austria is to establish a new secret service, and the Federal Agency for State Protection and Counter Terrorism "will be able to spy on any citizens without having to ask for a permit from judge or prosecutor." (URL 19). As a matter of cause, these substantial changes have induced discussions regarding current Internet politics. Nevertheless, FF has not actively protested against such developments, since it does not present itself as a one-leader party with one shared vision. Some participants have shown high interest in the matter, in contrast to others, who have not paid high attention to the legal decision.

Despite the worries and concerns produced by mass media and some interlocutors, FF has provided one refugee house with Internet access (to be described in a further chapter). There are surely no perfect concepts for dealing with the anonymity issue and FF cannot provide an excellent solution to this unresolvable task. However, FF has succeeded in finding the imperfect golden mean by making the decision to create a community where people know each other personally. This decision forms the basis for acting in a more calm and rational way. They do not have a great deal of fear when they hear about uncontrolled abuses on the Internet or when talking with concerned people. Thus the ability to control their network provides a feeling of security even in moments of crisis. In contrast to uncertainty, which is probably one of the major factors that drives people to anxiety, FF profits from the openness strategy and exchange of knowledge. Even when affected by spam attacks, FF knows how to prevent or prohibit any further unwanted content. The only thing that gives FF concern is the required time-consuming work. Having the technical know-how and freedom to change own infrastructure increases the collective confidence. Thus it is highly difficult to harm the network and cause panic among participants. Although FF members follow the newest developments in the area of Internet politics with a great deal of interest, they are reassured that their network is stable enough for any possible disturbances. At this point the connection

to *independence* is particularly evident. The independent character makes it possible for FF to be anonymous and not anonymous at the same time. Being independent gives FF the freedom and calmness to decide about upcoming events and projects. Further, node owners do not have the feeling of being powerless or helplessness, since they acts as ISPs. Further, personal relationships among participants provide assurance in knowing that one will not be abandoned when technical problems arise.

Anonymity is consequently certainly not the top ranked reason for joining FF. Many regular guests of FF do not even have an own node, but enjoy the company of FF members. Anonymity on the Internet is a bonus that one can maximize by participating in the network. According to some tech-savvy experts though, FF cannot provide more anonymity than any other ISPs as a result of the encryption level. Decryption and encryption of connections or data is always possible using an extremely powerful computer. However, a group or individual would have to have great interest in a given person or organization in order to successful decrypt data, as the process is quite difficult. . For example, one can open the door to his or her room or house and hope that no one steals anything. Using a lock might increase the security level, but it is always a matter of time when it comes to understanding the process of picking this or that lock. In other words, by using encryption people can at least avoid small misuses of their identity or privacy. Script kiddies will surely not spend too much time trying to unlock one's password when it is too complex and /or encrypted.

Thus in most cases people use encryption software in order to protect themselves and not because they are trying to hide illegal materials. Moreover, again and again examples show that criminals do not even use encryption for communication (URL 20). Moreover, some FF members argue that if a person on an individual basis used a car for murder or suicide, prohibiting all cars would not be the best solution. This person might find another way to stick to his or her plan. Thus, one does not have to blame media technologies or demonize encryption, but instead search for possible answers in other areas. According to this logic, many mundane acts and objects should hence be forbidden, beginning with knives, forks and chopsticks up to changing water temperature or light intensity. FF members do not share this view.

This traceable comparison with mundane objects leads to the next category of *natural resource*. It is this category that represents FF's personal beliefs and values of understanding the Internet as something profoundly necessary in today's world.

4.5) Natural resource

"I think the potential of what the Internet is going to do to society, both good and bad, is unimaginable"
David Bowie

It is undeniable that the Internet has become an integral part of our everyday lives and is often considered to be a natural resource in today's world. The challenge here is to understand the different notions of a resource according to the consumer and producer.

First, the consumer usually focuses only on using aspects and does not see the production chain behind certain final products and devices. They have become accustomed to the constant fulfillment of particular needs, and the availability of them is presupposed. Who thinks about how privileged they are when, e.g. using the water-tap, public transportation or ordering food at restaurant or for home delivery? Additionally, one does not recognize processes, which are assumed to be normal. Who is surprised to see people on the streets when taking a walk? One is not surprised to see people sitting in the theater or people dancing at a discotheque either. Consumers recognize a difference immediately only when products or processes start to become *abnormal*. In the eyes of FF members the Internet has become a presupposed natural resource, especially in industrialized societies.

Moreover, various surveys and studies show that many Internet users associate the Internet only with applications they are using in their everyday lives. One survey has even shown that some people confuse Facebook and the Internet so much that they believe Facebook is actually the Internet. In fact, 65% in Nigeria, 61% in Indonesia and 55% in Brazil agree to the statement *Facebook is the Internet* (URL 21). Daniel Miller's ethnography in Trinidad titled *Tales from Facebook* (2011) exemplifies the significance of Facebook for social relationships and demonstrates how it can lead to love stories, breaking ups, changes in self-expression or even a notion about space and time. Thus Facebook is much more than just a commercial website. Among many other social networking services, it has changed the idea and usage of the Internet in a groundbreaking way. But what is behind social networking services, cell phone applications or Internet access? Many FF members share the opinion that a non tech-savvy user of the Internet does not know how it actually works. Furthermore, it is not the user's job to know since he or she pays for this service.

Such thinking leads to the second notion of the Internet as a natural resource. In this context, participating in FF offers the ability to switch the role from passive user to an active one. It is comparable to the situation when one starts an internship in a factory or volunteers at an organization with the aim to achieve experience and understanding of the work stages

behind the end result. What do the stages look like behind the consumer's plate? For FF members, today's trend of *conscious purchasing* confirms consumer thirst for knowledge. The desire of consumers to support fair products and ethical working conditions shoots fair-oriented companies to new heights. Interestingly enough, it affects not only foodstuff companies, but also companies in the technical field. E.g. the so-called social enterprise company *Fairphone* was founded to produce cell phones under fair conditions. The concept aims to be as transparent as possible and to demonstrate every work step of the manufacturing process to its clients (URL 22).

However, while this interior view is only for demonstration purposes, FF provides the opportunity for actual participation. It is built on the fair use principle and encourages all users to treat each other with respect and fairness. Some interested individuals were initially attracted to FF meetings for transparency reasons, since FF usually is perceived as having fair conditions for everyone. The essence of the fair use principle is that every member should use the possibilities of the network such as servers, speed connections, etc. in a fair way. As the Internet is perceived as natural resource, it consequently should also be free and available for everyone.

> "The idea that Internet is a free resource is true by looking at its development history in Europe. The Internet was introduced here by universities and not the military like in the US. The first European Internet users were researchers. Many universities had library access to the Internet even before web browsers existed. (…) The Internet was a free resource where people could collect free knowledge. Scientists have said that they need the Internet to exchange knowledge, research results." (I6, 18.01.2016)

This is why FF's notion of the Internet as natural, but at the same a time free resource, contradicts with commercial projects such as Facebook's ambitious goal to provide Internet access to so-called developing countries by founding *Internet.org*. It is interpreted as a *net neutrality* violation, a personal belief and value (illustrated in the next chapter). The fundamental right to freedom of information should allow every citizen in the country to obtain access to information and hence the Internet. What if people no longer had access to air, water or food? It is more than simply discrimination; it leads to degradation as well. To seal off particular people who do not have enough money or knowledge from Internet access is for FF not only against personal beliefs, but also against the law.

Thus the fact that some FF members have decided to provide a refugee house in Vienna with free Internet access goes along with these basic ideals. The roots of this decision go even back to the Enlightenment way of thinking and ideas of humanism.

> "Why? It's a moral-ethical principle. It's based on deep entrenchment in the ideas of humanism or the simple taking of the many ideas of Enlightenment and humanism in the sense of self-thinking and independent beings that can differentiate between good and evil. And of course the freedom of a person with his electronic devices (...)" (I6, 18.02.2016).

In the same that a person should have the freedom to differentiate between good and evil, one should also have the freedom to make autonomous decisions. To relieve someone of the responsibility of making own decisions means acting against the principles of humanism. Some FF members consider the philosophy of humanism even more meaningful than current philosophical approaches. The most significant of Europe's social achievements was to accept that people have to be treated equally regardless of their origins. One should hence demand the right to freedom of information. Every human being, including refugees as a matter of course, should have these simple, but forgotten rights. In today's world the Internet is without a doubt a natural resource that should not only provide users with basic democratic values, but should also be deemed as necessary for living as shelter, food, water, etc. Humankind should bridge digital divides not only between rich and poor countries, but also between rich and poor within a single country. Everyone should have the right to inform him or herself. The Internet is the only way for refugees in Vienna to stay in contact with their families and not be discriminated against in terms of their right to freedom of speech and information.

Unfortunately, the hands of many people are tied in the figurative sense nowadays, leading to impotence to change current circumstances. One should not be astonished by the fact that access to a natural resource such as the Internet is not free, since access to other natural resources such as land or water can also be denied. From the example of water it is clear that in some areas access to this natural resource can be privileged or privatized by commercial companies. Thus a natural resource does not equal a free resource. In this sense, besides water, food and shelter, humanitarian help for refugees should also include Internet. Commercial ISPs not only feel no moral compulsion to share access, they actually do not have the technical capacity to realize the idea into practice. The only possible access would be to use the cost-intensive mobile radiotelephone service. FF has taken over the task of establishing a new node with free and/or libre Internet access. From FF's perspective, it is much easier to share something if it really belongs to you. The obvious efficiency of this approach can be exemplified in many cases where official ISPs have failed to establish an Internet connection. Lack of success is a result of the many involved complications, starting with bureaucratic obstacles up to the lack of flexibility and already issued freedoms. FF responds swiftly to changes and new developments. It would not even be a problem if the refugee house were to be displaced because chances for a positive Internet connection

increase due to the decentralized principle of the mesh network. Thus installing a node for the refugee house means giving and taking at the same time. In other words, by giving someone a node so they can participate in the network, they are not only being provided with Internet, but also expanding the network and making it more stable. As Aaron has already illustrated in the previous chapter, it is always a win-win situation for both parties.

The Internet as a natural resource corresponds for the most part with the perspective of media technologies as material culture. One surely develops a certain notion of the Internet when one can see behind the curtain of production and understands the processes on an engineering and technical level. Cyberspace for FF members is not a place to simply consume various content. Many consider the Internet as a place with a multitude of services. Besides Facebook, the Internet is used for working on different tasks. Thus the Internet consists of software. It is a place that *somehow works* and where you can consume various content or even use such content to earn money. One does not have to understand how the Internet actually works in order to become, e.g. a successful blogger or YouTuber. This example can also be adapted to any other institution that produces content. Be it a university, television studio or music production company. Although one needs many helpers, workers and professionals in order to realize a lecture, talk show or concert, one usually cannot even name one of these people. FF also fulfills the role of a simple provider. Nevertheless, FF members do have personal beliefs and values that they are following. They would not provide Internet to any extremist parties or neo-nazist movements.

Luckily FF has not had a request from any radical areas so far. At first sight it might seem hypocritical for them to be against providing Internet for certain groups while propagating the Internet as a free resource for everyone. However, by scrutinizing the personal beliefs and values, one can see the logical comprehensibility of this decision. One cannot be a member of this organization without according to their personal beliefs and values. One would contradict FF principles by declaring sympathy for racism, sexism, homophobia or any other similar ideas of discrimination. In this context, FF represents a grass-roots democratic structure that only works when its members accept this structure. To offer the infrastructure for radical ideas would mean to allow exploitation. It would mean working against personal beliefs and values. Thus refusing to provide Internet to right-wing extremists is not discrimination, but a demonstration of an attitude that is against discrimination. Since right-wing extremists use discriminating slogans and aim to implement their ideas as soon as they would come to power, one simply shows protest against this discriminating worldview, which again contradicts own convictions. In this sense, there is a

difference between supporting and helping.

> "While others are helping with clothing or food, we are helping with the Internet. Humanitarian reasons. We cannot cut somebody off from the Internet. We are so deep in all these issues that it would mean taking somebody's rights away."(Aaron, 29.12.2015)

The current refugee's need for Internet access has proven FF's beliefs and values in two different ways. On the one hand, it has demonstrated their belief in having access to the Internet and information. It is an undeniable fact for them that one cannot participate in today's world without access to computers and the Internet. It provides the possibility to be heard without spending too much money on equipment. As long as one has a working computer and Internet access, communication with others is possible. It is left to the user to decide which content to consume or distribute. Moreover, it should be one's free will to decide whether to repair or replace a device with a new one. Since some FF members justify their humanitarian background with the ideas of the Enlightenment, they do not control or censor participant and refugee access. As a person who can differentiate between good and evil, one should also have the freedom to decide own surfing habits. FF members enjoy illustrating how the Internet works in examples taken from our everyday lives.

Following this reasoning, we often do not recognize all the privileges that we actually obtain and take for granted during mundane activities. One does not, e.g. wonder why we are allowed to adjust the water temperature or make independent purchase decisions. There is no official authority that can forbid enjoyment of a cold shower. Internet usage should work in much the same way. Nevertheless, typical Internet users do not see any parallels between everyday activities; they understand the Internet only as a virtual Cyberspace. That is why nearly all FF members plead for more analysis of the Internet as a physical infrastructure. People can use the Internet differently, only by knowing all the possibilities it actually offers. For those in the already illustrated example who agree to the statement *Facebook is the Internet,* the fact that the majority of FF does not use Facebook at all would probably be shocking.

FF members rather experiment with different adjustments, develop their own software, make contributions to wikis, set up own servers or explore many other new possibilities that the Internet provides. From FF's view the Internet is much more than a simple social network service.

> "I am firmly convinced that the Internet is a resource that has been growing in the fastest way for the past ten years. I am further convinced that it is a resource that most are now dependent on. I also believe that it will develop further in an extremely exiting way. Most progress will probably concern speed. I am completely dependent on this resource as well, in a professional and private way. And it is simply great when you can participate and use all the advantages and disadvantages." (Christian, 14.03.2016).

Despite all the illustrated positive notions of the Internet by FF, some members like Christian do have an ambivalent relation to the Internet as technology per se. We have grown so dependent on this technology that it becomes highly important to ask the question of who controls the Internet.

Before the Internet, people were very careful about declaring personal information. Today, people are voluntarily revealing a huge amount of information about themselves. This ambivalent notion leads us further to a discussion on technological progress itself. While FF members in the beginning were seeing themselves as pioneers in many technological developments, today the technology industry makes huge progress everyday. Usual users cannot even control most of the processes that are appearing from use of the Internet. Nevertheless, there is also the opinion that the process has in a way stagnated. One does not recognize recent developments in a groundbreaking way. The most central improvements mostly concern power or speed. Just as the first iPhone revolutionized the computer and cell phone industry, nowadays new models are mostly about better performance of chips, cameras, memory, surfing, etc. and do not bring convincing innovations. For the first time in history Apple has announced a drop in iPhone sales and the global market reports falling demand for smartphones in general. Such circumstances confirm the motivation of FF members even more to participate in the organization. They do not specialize in product development and do not share the view of replacing a certain device every season.

Rather they approach technology from the interior instead of exterior angle. Thus it presents reliability, stability and many possibilities for experimentation. FF does not follow the trend of *less is more* because members truly use much more, e.g. not only notebook connections but also the connections of other devices. Such devices are not accessories for them, but hand tools for building the network. Freedom to tinker and experiment is what motivates people to participate in the organization and not brag about new products. In order to facilitate a comparison with other natural resources, FF does not grow food or sink a well for a fancy restaurant. They do it for self-supply reasons, which do not exclude the fun aspects and the fascination for DIY.

For FF members, the Internet has become obviously more than simply a tool for communication. It is a resource that should be treated in today's world as much as a natural

resource as other resources. It has an impact on humankind and shapes the nature and environment in its own way. Cables, antennas, routers, servers, computers and many other components of the Internet as a resource further represent a material conflict of interests. As is the case for other natural resources, various interested parties are trying to come to power in order to pursue their particular interests. Some of the interested parties disagree in almost all points to the personal beliefs and values of FF. Since FF accords in such debates with the principles of *net neutrality* I will depict this category in the next chapter with a strong relation to my interview with the Austrian activist Thomas Lohninger.

4.6) Net neutrality

Last but not least, *net neutrality* is surely one of the basic values of FF members. The ideas and demands of net neutrality are more or less the quintessence of all categories previously outlined. A brief definition of net neutrality reads as follows:

> "Net Neutrality means an Internet that enables and protects free speech. It means that Internet service providers should provide us with open networks — and should not block or discriminate against any applications or content that ride over those networks. Just as your phone company shouldn't decide who you can call and what you say on that call, your ISP shouldn't be concerned with the content you view or post online." (URL 23).

Thomas Lohninger, founder of the project *Save the Internet*, started programming at a young age and came to the hacker culture by listening to podcasts. Being a social and cultural anthropologist, he experienced a *going native* moment while conducting ethnographic fieldwork among hackers. As an anthropologist, he was much more fascinated by hacker collectives and net political aspects than interested in developing a critical distance to his field of study. He quickly became an active participant and activist for principles of net neutrality.

> "I believe that you have to complement stuff. There are hard and soft disciplines. There are hard things that deal with math, stuff that could really build systems. And Anthropology is a discipline, which tries to understand systems, which tries to explain them, which tries to translate between them. I liked that about Anthropology; that it is something very close to the people and which allows you to bridge social gaps. And I was myself sort of a translator between social contexts. This turned out to be a brilliant combination." (Thomas, 24.02.2016)

If someone were to ask for a short answer to the question of what net neutrality is, the answer would probably focus on the idea of being against discrimination or avoiding discrimination at very different levels. This category not only wholeheartedly represents one of the main values of FF, but also constitutes the structure of the network on the technical level.

> "The Internet just delivers packages without looking at them. This is both a technological decision about the optimal network design as well as a political decision about disabling control. You can define it in many ways, but the core principle that I like most is that by design, the Internet is a stupid network. It is not making decisions itself about any data package it delivers; it only looks at the information necessary to route it towards the next hop." (Thomas, 24.02.2016)

As already mentioned, FF perceives the Internet as a resource that can be changed, controlled and adjusted. The neutrality principle is one of the most essential aspects of the network because it otherwise would prefer one connection, package or content over the other. The most groundbreaking idea of the Internet, to treat everyone equally, would be disturbed. By using again the water example, it would mean that certain people would have the ability to obtain warm water and others not. In other words, people without privileged positions and with limited financial resources and strength, would be cut off from access to information. Likewise, the producing of information could also change in a dramatic way. As I have briefly illustrated in the chapter on *media technologies as material culture,* geopolitical conflict of interests can be transferred to cyberspace whereas demands on power and space become relevant. This means that certain people could control content in order to enforce their specific interests and concerns. FF tries to establish a physical infrastructure that everyone can use without fear of being censored or banned. Interference in the structure of the Internet would mean dictating one's behavior online and discriminating against people with other worldviews. It is hence not a surprise when net neutrality advocates relate this topic to freedom of speech. The often misunderstanding by people, who have not delved deeply into the subject, is that net neutrality activists try to change something and are making new abstract demands. Unlike this view, as the title of the project already implies, net neutrality activists try to save and not change the Internet.

Vast amounts of money are involved in structuring of the Internet, and those without certain capacities could be simply discriminated against. In contrast to television, the Internet has created a system where everyone is treated equally based on the decentralized principle. There is no huge Internet conglomerate deciding on what content to show. Every network operator is responsible for his own network, making censorship on the Internet difficult. This basic principle helps people to speak freely about every topic they want to share. FF's slogan says nothing more than *we are the network.* They simply accept the fact that using the Internet as a natural resource means making reasonable and economical use of it. Just like it is impossible for all roommates to shower simultaneously, FF's user must use the infrastructure as much as possible without discriminating against others. Destroying the net neutrality principle would however mean offering shower packages to certain rich roommates. It would

only lead to a certain person or a group of people being allowed to shower the whole day whereas others would never have the possibility. Thus as a *normal* citizen one should insist on his or her right to equal treatment because net neutrality opponents are usually big corporations and certainly not end users or small business owners, startups and entrepreneurs.

Another example that FF members often use considers a petrol station as a metaphor for the Internet and cars as the content. What would it mean if only, e.g. Mercedes drivers were allowed to refuel? In this sense, termination of neutrality would affect every driver of other car models. Or what would be the effect of certain cars having speed limits on the highway whereas other cars are allowed to drive as fast as possible? The solution in this scenario is to request a higher participation fee for all participants who want to enjoy certain privileges. Net neutrality advocates however propagate the equal treatment of every data package and not extra payments, e.g. for YouTube users to watch videos in Full HD or Skype users to obtain better streaming quality. As long as everyone pays the same toll charge, treatment should be equal and fair.

The demand for net neutrality is truly interwoven within hacker culture and hacker ethics, which propagate that all information should be free.

> "In a way it is a libertarian definition of freedom because it is always the freedom of the individual. To choose, to use, to reuse, to adapt, to share, to *not* use the manual, to burn the f*cking manual and to do something completely different with this piece of technology. Not to be restricted by a manufacturer, by the government or any agencies who have the power to restrict speech." (Thomas, 24.02.2016)

Since it is always a question of perspective, hackers and FF members do not see themselves necessarily as lateral thinkers. In most instances they do not reflect on every step and decision. They simply follow the urge for exploration and experimentation. This unique approach to technology makes hacker collectives so compelling, vivid and irreplaceable for all participants. Restrictions of freedom in the form of net neutrality are seen as difficult to implement and logically inconsistent. Everyday life is intriguing and full of excitement, which one discovers and shares with others. The culture of openness brings hackers from all over the world together and does not give the feeling of exclusion. Net neutrality provides first and foremost the opportunity to be creative. Creativity though does not mean, e.g. making a fancy YouTube video; creativity means living a curious way of life, which Coleman (2014: 34) compares to tricksterism.

> "Tricksters as much as hackers are very creative with their means. They are the ones with less control, with less resources, also less symbolic capital for the most part, but still they manage to make big successes because they are more creative with technology and systems in general. They find creative solutions. A hacker is anybody who is creative with technology or any different systems. You can be a hacker, like in the metalab, who does photography. They build their own cameras." (Thomas, 24.02.2016)

The most common mundane activities deal with *re*-doing something. Reinvent technology, reutilize, restructure, rethink, redesign, rewrite, reconstruct. The output is however original and creative in most cases. In this context, hackers as well as activists agree to their role as tricksters, since their opponents usually have better equipment, networks, protection or support. Being an activist means showing wit, coming up with more creative and better ideas or arguments and pushing the opponent into a corner with ingenuity. Creative and provocative humor is usually a weapon to reflect on society at large. It is a quick-reacting mode of communication with the same frequency.

In contrast to activists, FF members do not have a certain opponent. Even when some members appreciate the work of activists, they cannot find the time to manage two pursuits at once. Nevertheless, both sides respect and support each other and share mostly the same views. It is extremely important for both to have the freedom to build an own wireless community network in a country. The difference between both groups is probably that the activist side shows readiness to make an actual change in politics. It is idealistic to believe one can really change the world for the better. When activists decide to go beyond the role of nerds, they assume the role of translators between social contexts. The goal is to speak in a simple and clear language to a wide audience as opposed to only working in small hacker collectives. When goals are achieved, activists are motivated to continue their work.

Why is for instance the city of Vienna giving money to commercially oriented big corporations instead of supporting community networks such as FF? For many activists this decision does not make any sense. FF still needs a lot of work in order to be conducted in a way that really changes the thinking of powerful people.

> "Internet is too important for our society to put it in the hands of just a few companies that all can claim they are too big to fail. All telecom companies – which it is my job to fight in all lobby battles – have this one dirty argument, which I hate: we have to make money; we have to invest in our network. Because they own the network…the fact that they want to make money suddenly becomes something that politicians listen to. (…) They are not evil; they are capitalists." (Thomas, 24.02.2016)

FF certainly does not fight within the context of lobby battles, though lobbyism is not interpreted with a negative connotation. Since no possibilities exist in our society to enforce interests in a different way, FF advocates for productive lobbyism that aligns with the organization's values. When activists' movements exist that are demanding and do not fully

correspond with the ideas of FF, net neutrality advocates get to the heart of the *true* goal of the Internet in the sense of FF. The neutrality aspect is the part of hacker ethics where one's degrees, age, race, sex and position do not matter. Many of the FF members I spoke argue that technology is a priori neutral and has no color. Neither data packages, nor people who are sending them should be treated differently.

To discriminate digital data packages means to discriminate against people since behind any technology or physical infrastructure are actual living human beings. Thus in what way can Internet users fight for their digital and/or human rights other than being involved in lobbying battles? It is a rhetorical question for many people, since the Internet does not know a country's frontiers in principle. Most legal decisions apply to the European Union and not simply to one single European country. Digital rights again affect every citizen in the same way regardless of one's degree, age, race, sex or position. In the end the only way to be able to turn the ship around or implement new strategies is to become familiar with legal foundations.

> "Net neutrality is basically discrimination prevention. You are trying to prohibit ISPs from abusing their power over the network in order to give a competitive advantage to individual applications or services. You guarantee a field for everybody, which allows big and small providers, the commercials and the non-commercials, the Microsofts and the Wikipedias, to be on equal footing with each other. And to have this *last* really egalitarian space for ideas." (Thomas, 24.02.2016)

While FF's ideas reach in most cases only participants within the organization, the net neutrality principle tries to reach and speak to today's globalized world. It is a principle that can actually be applied to a certain country by law, e.g. in Chile, India, the Netherlands, etc. Paradoxically, the mode of communication among activists from the internal perspective is reminiscent of philosophical and political debates on a very theoretical level rather than discussions on concrete technical aspects. Although the majority of FF is truly fascinated by the work activists are doing, many members do not show interest in activism or any other net political events. Motivation for participating in FF is for them the not established condition combined with the urge to explore and search.

Activism on the contrary needs to be one hundred percent sure about demands, truth claims, programs and realizations. Instead some FF members prefer to stay skeptical and formulate their philosophy in their own words. They do not like the idea of having a certain label because labels often change their contexts, contents and goals. Thus, e.g. to declare oneself as feminist, Marxist, liberal or conservative would mean using terminology that already has certain associated labels. Some FF members additionally do not want be associated with any political parties. While the German equivalent *Freifunk* is not afraid to be

associated with the Pirate Party, FF is very cautious of being associated with any political party, even if the party sympathizes with many demands of a certain party program. Moreover, some former politicians have failed by bringing ambitious plans for reorganizing the organization with well-known political strategies.

Nonetheless it certainly does make sense to include net neutrality as a personal belief and value of FF because it is more a principle than a political program from FF's perspective. A term such as *net neutralitist* does not exist and thus cannot be used for misleading interpretations. Beyond that, the concept of net neutrality has a very strong and specific relation to technology from the external perspective whereas the other above addressed labels deal more with social and political movements or rigid ideologies. Net neutrality is one of a few concepts, which can be used to grasp FF's values without certain labeling. In contrast to other radical demands by activists, it uses the techie's tradition of speaking of processes in very concrete and logical terms without a strongly abstract philosophical level. Thus when from the inside activists enjoy holding philosophical debates among each other, they present only clear facts to the outside.

Net neutrality is a principle that puts FF's idea of how the Internet should work into words. It is a democratic principle where even the word *neutrality* does not advocate for extremism or radical action, and prompts a positive response among many hackers. It appeals for maintaining the course and not for starting an irreversible process of discrimination.

> "There is a reason to believe that goodness in man is not a totally implausible idea. I think the basic premise in open systems and networks like the Internet and FF too is that you can trust people. A system that allows maximum individuals freedom is also a system that allows the most possible utopian reality. (…) If you have this general unconscious trust and mistrust in other people, if you feel like this society has a chance than it makes sense to fight for freedom for all of us." (Thomas, 24.02.2016)

The often-raised *trust* issue (discussed in detail in chapter 5.1) motivates people for participation as well as activism. In this context, net neutrality is more than simply a technical procedure helping the network to work in a stable manner. It is a chance for everyone, and for education and participation. Even the most remote regions with Internet access have the same chances for participation as central and influential areas. Despite the language barrier, net neutrality advocates believe in the productive and positive development of society in general, where everyone has the same chance for participation.

Openness is hence the only way to include every user. Irrespective of the share in the costs, people could use the network equally. This idealistic and solidary scenario that almost miraculously exists today motivates FF members as well as net neutrality activists to take part.

> "In general technology has brought us closer together. If technology is an inherent function of us, which distinguishes us from any other living form on this planet, then we have to believe that technology also brings us closer to what it means to be human and allows us to have more elaborate forms of exchange with one another." (Thomas, 24.02.2016)

FF members and Thomas further believe that giving up decentralization and promoting centralization would mean losing personal freedom, and subsequently always lead to an authoritarian regime. By analyzing historical processes of humankind, Thomas has concluded that centralized and authoritarian regimes have always failed in the end. It is predestined for failure simply because the system cannot work for a long period when controlled by one centralized institution There is always going to be a time when authorities lose power and the system falls apart. He dreams of having real democracy, which implies never-ending discussions and debates without discrimination, that can be achieved at least on the technical level by the principles of net neutrality and the Internet. FF members do not go to this abstract philosophical and visionary level, but aim to achieve these principles at least for their own network.

5) Use of Media Technologies in "FunkFeuer Wien"

The following two sub-chapters discuss the specific uses of media technologies not from a technical and engineering perspective, but from a perspective that emphasizes social aspects. Although the central interest of FF members is mostly dominated by technological topics, research has shown that the basis for certain uses of media technologies is not expressed simply on a technological level. Thus the use of media technologies in FF is expressed rather by the categories of *trust* and *cooperation.* These categories are not personal beliefs and values though because they are explicitly connected to the ways of use and to ideas that can be elaborated on in theoretical debates. They are unavoidable components to obtain when joining the organization or trying to gain success. It was possible to determine a specific way of working together by conducting participant observation and many interviews, and taking part in conversations. In fact, both categories exemplify the foundation of the network and strong connection to materiality in the form of media technologies.

In addition, both terms were chosen to represent the organization from the inside and illustrate their specific notions in relation to praxis. Both terms further briefly and concisely sum up the most essential issues raised concerning use of media technologies by most participants. Although some categories such as *programming, building, creating, etc.* could also describe their working processes, it was important to zoom out and determine not only generic terms for these processes, but also find true aspects of community cohesion. It was necessary to break down all the complex tasks, operations and procedures of FF members in order to show those issues receiving most attention during discussions. Besides the many other addressed ways of working, FF speaks primary of these two categories to accentuate their uniqueness and differences to other ISPs. For other programmer collectives, engineers, hackers and so forth have working habits that might remind them of FF's everyday tasks.

However, especially *trust* and *cooperation* are two aspects that distinguish FF from other working groups and particularly commercial projects. These terms might surely fit to any other organization or company, but the following two sub-chapters present them in the context of FF's special view and implementation. Since nearly every term has its own explanation and interpretation, the goal here is to show FF's specific perception and to link these terms to the certain ways of use of media technologies. As in the choosing of speaking of personal beliefs and values, FF members are careful in depicting their ways of use in order to avoid misconceptions. From FF's perspective, *trust* and *cooperation* are terms, which do not evoke any labeled or bad associations and make the complicated simple. They truly grasp the complex and frequently incomprehensible ways of use on the technological level.

5.1) Trust

"On the Internet, nobody knows you're a dog."
Peter Steiner

Trust is the basis of the smooth operation of the FF network. The term has many interpretations and notions among participants. For some it starts with the decision making process where every user has to decide whom to entrust with his or her private data and traffic. For others it often starts with the mistrust of other systems: for some newcomers, previous bad experiences are decisive factors for mistrust in official ISPs. There are a variety of reasons for these misgivings, including impersonal and incompetent service, which often leads to interruptions of connection. Since the contact person usually changes from one service call to another, the relation to the ISP always remains impersonal. Further, the problem and specific requests must be repeated and explained again and again. At a certain point any great expectations are lost and mistrust in all official companies grows. Conversational partners interested in joining FF often describe a particular case that was the last straw. Fed up with incompetence and complete dependence on usual ISPs, they started to search for alternatives.

FF then has the task of fulfilling all great expectations and regaining the user's confidence. As a matter of course, FF often frustrates these newcomers when it does not surpass all expectations. The difference between a newcomer and a long-time member is very often in their assessment of the network. While newcomers usually emphasize ideological and philosophical components on a very abstract level, long-time members very often speak simply of having better stability and more trust. For long-time members it is no longer mistrust in other networks, but having more trust in one's own. Newcomers in turn arrive with great mistrust in all other networks and hope to receive better service and the feeling of a real network. As for many other groups and communities, people begin to trust each other after spending time together. Besides that, trust increases during emergency situations and in situations of crisis. That means holding together for a period of time even when the network is not trouble-free. Since FF requires a great deal of patience and perseverance, one cannot simply start to benefit from one day to the next. Some FF members have become real friends because the tasks of the network are very often challenging and require taking responsibility. Hence it is a good platform to get to know each other in an unconventional, serious or even adventurous atmosphere.

> "Our society is designed in such a way that we always have to trust someone. You have to trust somebody. The difference at FF is that you have the ability to participate and control what happens. You cannot do this with commercial providers. People are doing something together, but can mutually take care of themselves if somebody makes trouble or tries to make technical things that harm the network. (…) It is like a forum in ancient Greece or Speakers' Corner in Hyde Park where you can simply say: that's bullshit, I don't want it." (Aaron, 29.12.2015)

Knowing each other for many years in person also of course changes the perception of media technologies. It is not an impersonal infrastructure that one simply uses to pay rent. It is a physical infrastructure that has been self built, shaped and maintained over the years, and hence many memories are connected with these experiences. The use of media technologies in this sense is more personal and emotional. As many FF members have already suggested, the slogan *the infrastructure belongs to us* is crucial to the philosophy of the network; members truly believe in this perception. If the network of commercial ISPs were to break down or be destroyed, users would probably be angry only at the fact that they no longer have access to the Internet. FF members for their part would express much more emotion because they truly spend a great amount of time building the network with their own hands. In this sense, the use of media technologies comes with a high portion of awareness, recognition and appreciation. It is no longer a mysterious and invisible process where one switches only into the role of consumer.

It is probably comparable to the difference between employees and self-employed individuals. A very common stereotype identifies a usual employee with more indifferent characteristics, since he or she does not have the same passion as someone who is self-employed. A self-employed person on the other hand shows much more passion in this scenario because he or she is the one taking the risk and trying to establish a good reputation. This example should under no circumstances confirm this stereotype, but simply tries to express the self-perception of FF members. Since every full member of FF is also a node owner, a good reputation is a criterion that motivates him or her to continue to work and actively participate. The important position and responsibility of being a node owner and key member within the organization also increases respectful interaction with technology. Of course it is hard to say if this interaction increases the moment these members joined the organization, but many members have witnessed a change, which includes awareness when dealing with various products, devices and media technologies. For many people, this is the crucial moment when they recognize the effects of their participation, be it in shaping the physical infrastructure or producing and implementing new creative ideas and projects.

> "I think it is simply trust. We are not *that* different on the technical level as other ISPs. We do not do anything that others do not do. The trust is what matters in the final analysis. People interact. And I would say that one trusts more, e.g. Clemens than a guy from UPC, because he or she knows Clemens very well and simply trusts him. Of course Clemens could take advantage of this trust and cause trouble, but it is this checks and balance element. He simply trusts that Clemens will not f*ck up. That is the community feeling. 'I know him.' It is mainly on the emotional level and not the technical." (I7, 07.03.2016)

Some conversational partners have even recognized a rising interest in FF after Edward Snowden's disclosures on global surveillance. The resulting feeling of uncertainty brought many people to the question of *whom can I trust and where do I have to be very careful? Can I trust my ISP? Are there any alternatives?* Long-term friendships and acquaintances encourage members for further participation and to aim for the ambitious idea of doing it better than others. On the other hand, this strategy leads to a dead end because it becomes much harder for the networks to expand. Learning to trust each other requires a great deal of time. Thus the expansion of the network cannot be successful using this principle. Here again the opinions of members who want changes and those who want to stick to the old strategy are split into two different camps: while some advocate for more flexibility and easier access to the network, others point out that giving up the trust principle of the organization would lead to a chaotic state.

At present, FF members share and use media technologies based on trust. This trust again is based on the personal beliefs and values outlined above. Though to present those interested in joining FF with a list of required personal beliefs and values, and a certain way of using media technologies, would contradict these exact beliefs and values. Thus some members find themselves in a dilemma, whereas others do not over-complicate the situation and simply enjoy participation in the organization.

> "I think, based on gut feeling, that it will need a hybrid structure. Some members should work on the core principles and some should have the freedom to have fun with the technology. (…) Take Red Cross as an example. It has full-time employees and volunteers at the same time. I do not want to harm anyone now, but volunteers usually like to participate in emergency cases as paramedics in order to handle interesting commissions, and not routine work such as bringing people for dialysis all the time. The same applies, e.g. for a volunteer fire brigade." (I7, 07.03.2016)

Dealing with technology on a principle based on trust puts technology subsequently in a new light. Owning a personal computer does not oblige one to share it with others. In fact, as the name already suggest, a computer is supposed to be personal in this context. It is delicate work to propagate openness, a shared culture, and free access while at the same time saving the personal aspects of computers. Although the network of FF consists of much more components than simple computers, they still manage to retain the personal and individual

character of the network. It is probably mostly a result of the possibility to act as an own ISP, but also have the feeling of being an actual part of the network.

In addition, the feeling a given member has that other members have confidence in him or her enhances social responsibility and social recognition among participants. As a result there is high motivation for realizing new projects and ideas, and for speaking frankly. Having this protection in the form of social recognition in mind motivates people to the next step of carrying on healthy debates for further development of the organization. It is no longer a question of fluctuating between participation and non participation. Once a member has reached the position of having confidence in him or herself, acceptance into the network and active participation is enjoyed. Though it is not an elite club, outsiders are clamoring to join.

Trust is more than simply knowing other members in person. It is a principle that makes everyday activities work in a smooth manner. In my case as a researcher, gaining the confidence of FF members was a step by step process that started with FF trusting me with the safe-keeping of keys to particular buildings. Since such an organization as FF often defends itself to skeptical outsiders, having possession of certain properties' keys is connected to huge responsibility. Losing these keys or misusing possession for criminal activities, e.g. stealing or breaking something, would depict FF in a poor light to the outside. The fact that FF has never misused its power and possibilities allows people to truly trust each other. The connection to *responsibility* is immense here. FF members are fascinated with all the abilities that this network offers. Many participants have admitted that FF is the only organization in Vienna that really gives its members so much freedom. It is a feeling of liberty and emancipation to stand on the rooftop of city hall or the Burgtheater right in the center of Vienna.

However, one should not have the impression that FF is a copy of roofers or any other extreme sport association. Members surely enjoy this freedom and the amazing views over the city, but these perks are not first priority. The central task remains building infrastructure and expanding the network. Climbing on different rooftops is a bonus for participants of FF. Neither during the research period nor according to interviews have members ever misused this possibility simply for fun. Interest is not in making photographic masterpieces or climbing on especially beautiful buildings to hang out; instead members aim first and foremost to build nodes at strategically perfect locations. Since the network works as a result of wireless connections, one cannot avoid climbing on high positions in order to install antennas. It is a part of participation in the organization, but not the main motivation.

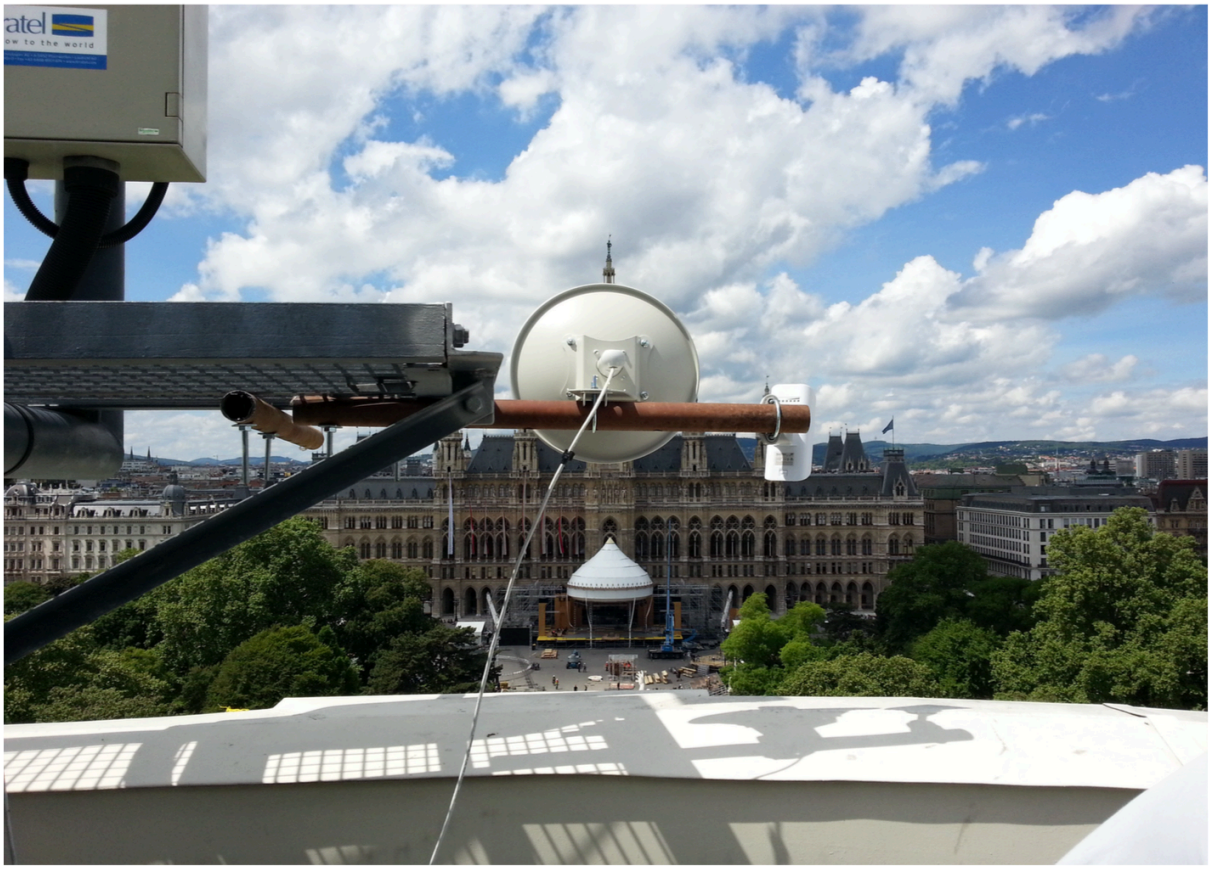

Figure 5: FF's antenna on the roof of Burgtheater

Again, rooftop access leads to winning members' confidence. Standing on top of a building or any other high position unites people and establishes a feeling of immense trust. It is not a safeguarded tourist attraction and the working process is based on mutual trust. There are no watchdogs to sanction someone's bad behavior. The illustrated personal beliefs and values provide acceptable security and contribute measurably to the feeling of community and friendship. This way of working presents flexibility, efficiency and security without the classic community building tasks that are seen in private business. Moreover, the non-hierarchical structure of the organization leads to fast productive decisions because members do not have to wait to obtain permission from an appointed boss or leader in order to take action. For newcomers it is further a great opportunity to learn how to build a node or maintain processes. That is to say, one does not have to apply for a job or internship to learn the technical side of the network. However, one should certainly not join FF with the idea of climbing rooftops because disappointment is certain with such an expectation. Since time on a given rooftop varies based on the work to be done, it can easily be that the task takes only a couple of minutes. Conversely, sometimes it takes several hours without break.

Figure 6: View from Vienna's city hall

The trust issue additionally helps in everyday tasks outside the organization. When people hear important news or information, they usually need an expert to understand the process in detail. This person takes a role that represents reliability or integrity. All news requires subject-specific analysis by an expert who will try to highlight certain and concrete strengths and weakness of this particular novelty. Moreover, sometimes an expert is needed to provide new perspectives and angles on long-established opinions. The consumer is searching for ways of orientation and usually relies on authoritative assessments of certain news and situations. People often listen to professional critics even when choosing to watch a film, go to the theater, visit an exhibition, etc. Their opinion is considered reliable. For example, lists such as *Top 100 Greatest Films/Books/Paintings/Musicians/Places/Dishes etc. of All Time* do not exist for nothing. People trust the suggestions of professional experts and critics, whereas they do not necessarily have to be of the same opinion. It helps to navigate the wide range of topics that life offers.

Technological developments are not so different from other topics. Various websites, forums, platforms, etc. are used in order to understand which technology is best, to decide which decision to make or to simply inform oneself or share own experiences. Many people come to hacker spaces to discuss the latest developments or for a second opinion. In contrast

to these people, FF members use weekly meetings for discussions and assessments of concrete issues. Since it is an organization built on trust, members are not afraid to discuss various topics in an open and direct way.

Moreover, members place more weight on each other's opinion than impersonal opinion from the outside. There is a straightforward reason for trusting when it comes to sensitive questions because one simply knows the other person and his or her special skills. It is not a paid advertisement if a fellow member recommends a certain router model or a specific notebook. FF members usually speak from own experience and have no reason to spread falsehoods. It is comparable to a recommendation from a friend. You certainly would not hesitate one second if you knew your friend had almost the same taste as you. It saves a lot of unnecessary research, especially when one is familiar with the various areas of expertise of other FF members. Another advantage of participating in meetings is the possibility to exchange different opinions. Researching on the Internet or asking an expert on your own leads usually only to a one direction conversation. This mode of communication provides both information input and output at the same time. It also helps when decisions on specific hardware have to be made.

> "We use commercial low-cost hardware, namely routers between 20€ and 120€. Theoretically you can use more expensive devices, but it does not achieve anything. (…) We have the freedom to configure software and do other configurations. Responsibility means making decisions. FunkFeuer provides barely any services. It only provides the functioning infrastructure. But what then actually happens depends on the individual user. FunkFeuer uses technology by trusting each other." (Christian, 14.03.2016)

Thus trust not only plays a significant role in online behavior, but also in behavior with actual living human beings. The initial proposed theoretical approach by Media Anthropology fits like a glove to FF's use of media technologies. They truly do not separate virtuality from reality and even emphasize the significance of the strong connection between the two in understanding the existence of the organization. At this point, the materiality of media technologies becomes especially clear. Already during the first steps of becoming a member, newcomers are made familiar with the necessary real hardware needed to join the virtual. It is no wonder than that this connection is so obvious for all participants. They start their "journey" from the very beginning of the process of creating Internet access.

People often overlook this connection when they are accustomed to seeing solely the *virtual* part of the Internet. It is a long road from buying hardware, obtaining access to a rooftop, making various adjustments and configurations with *real* people, and then later only talking with them in a *virtual* way. Of course use of the Internet is not only limited to interaction with individuals one knows from FF, but there is usually no getting around talking

with other members online when joining the organization.

Figure 7: FF's routers

A possible question to discuss would be to ask if establishing trust is only possible in the actual *real* world. Nearly all of my conversation partners have initially gotten to know each other in person, since the strategy of FF is the requirement of introducing oneself and proving that you – as the quote by Peter Steiner at the introduction of this chapter would make it seem – are not a "dog". Although people make virtual acquaintances with actual people, it certainly is a compelling topic to discuss the lack of distinguishing between online and offline acquaintances. When FF members speak of knowing other members over a long period of time, they speak of how such long-term rapport has facilitated the founding of trust. Typically such a relationship means the two acquaintances have met in person at some point. However, trustworthy use of the physical infrastructure and online data packages even more blurs the line between *real* and *virtual*. Focus is not on whether or not one has known a particular person in the actual world; emphasis simply falls on the fact that knowing a person for a long time without serious missteps leads to trust. Thus as the theoretical perspective of Media Anthropology suggests, the virtual world in this context is an extension or supplement to the offline world (Latham 2012: 82).

> "It is not only this wireless network. People do many things together. People have started own companies, made new friendships. One person became chairperson at a mountain association and has provided wireless networks to many huts in the Alps. We made an EU project with FunkFeuer in the past four years. A lot has happened here. Some publications were produced. It is much more than a wireless network. It is the hacker spirit. We do it, because we can." (Aaron, 29.12.2015)

This emotional aspect plays not only a crucial role in relation to media technologies, but also in relation to the history of the organization. The never-ending process of exploring, discovering and creating makes it possible to share memories that are crucial for the building of trust. In the end, each contribution of each member to FF's history is very different.

On the one hand, many participants feel it is a challenge to find a common langue with which to communicate with each other in an appropriate manner. They often argue about controversial questions and perceive disagreements as obstacles for further collaborations. On the other hand, FF experiences an immense advantage in having people with completely different backgrounds and differences in opinions. This diversity makes the organization a vivid platform with many possibilities for realizing miscellaneous projects. Paradoxically, it is diversity that can bring people together. True to the old adage that "opposites attract", FF benefits from the tremendous variety of its members' views.

The usefulness of every active participant has been proved in completely different situations. Sometimes the feeling of being useless disappears at the most unexpected time. That is why FF aims in the direction of letting go of the opinion that one has to be truly tech-savvy in order to participate in the organization. A contribution to FF does not necessarily have to be on the technical level. Activities such as designing stickers, key rings, t-shirts, etc. are also important tasks for furthering FF. Much of the needed administrative help requires no special technical skills. In fact, knowledge of technology is only one of the many capabilities FF needs in everyday life. A great deal of work requires no technical know-how, but patience, working posture and, as the title of this chapter already states, trust. FF members would surely prefer a person whom they can trust instead of a technical genius with criminal intentions.

Figure 8: Sticker at metalab. "Do you feel more safe from terrorism now?"

As in many other organizations, trust almost always plays a significant role among coworkers in presenting prolific results. However, in FF's case people do not have employment contracts and participation does not include specific commitments. A relationship based on trust a fortiori moves to the forefront. The already mentioned diversity though requires certain strategies for facilitating efficient *cooperation,* and it is this *use of media technologies* that is presented in the following chapter.

5.2) Cooperation

Beyond trust as a basis for fluid and efficient operation of the FF network, cooperation plays a central role in maintaining and improving infrastructure. It requires an enormous amount of work, lots of tact, sensitivity and good will by all participants and individuals who express interest in FF. If cooperation and diplomatic solutions amongst members were not present, the network would probably be nonexistent. In this sense, cooperation means simply putting ideas into practice. The network consists of members and groups with very different interests and levels of knowledge, and it is certainly impossible to please all involved.

For this reason FF has developed a specific strategy in the use of media technologies,

which allows producing free space for creativity and includes all opinions and ideas. As in the mind mapping strategy, where ideas are simply collected as a first step, FF uses free spaces for collecting as well as debating ideas. Cooperation on the theoretical level allows for discussion of what course future development should take. Since the organization does not have a certain leader or a schedule with specific steps, they naturally jump from one subject to the next.

FF's activities truly fit to Christopher Kelty's (2008b: 3) concept of a recursive public, which constantly makes, maintains, and modifies software and networks. The self-maintained existence of the public is based on the ability of outsiders to join without having to appeal to any leaders or authorities in order to have a say (Kelty 2008a: 3). Although logically some key players do exist, they do not contradict the concept of a recursive public. Further, control of means of communication is often a hot topic during lively discussions and debates. It makes FF a legitimate public sphere by aiming for cooperation and inclusion of all participants. Otherwise dialogue without inclusion of all would not only object to FF's concept of recursive public, but also be contradictory to its personal beliefs and values. The illustrated democratic principle of the Internet by Thomas regards conflicting interests not as a problem, but as a vivid and dynamic process that may broaden one's horizon. Thus the recursive character of FF means following certain rules of the game and not breaking rules in order to achieve personal interests or an authoritarian form of organization. However, cooperation does not automatically mean comprehensibility. In fact, in an ideal case, varying opinions should not prevent the growth and successfulness of the network. Even with various views, the work process should not be stopped. Many newcomers fail to go far enough when installing an own node and participating in the organization. Emotional aspects such as frustration, discouragement or lack of inspiring enthusiasm restrict cooperation and may even lead to rethinking of personal values and beliefs. It might be a disturbing feeling to use media technologies with the concept of *recursive public* and the strategy of cooperation, and it may simultaneously be a feeling of being heard and unheard.

> "To cooperate means in the old-fashioned expression: show solidarity. Cooperate for the benefit of the participants. There are reasons of self-interest of course, too, be it Free Software, be it Wikipedia or be it FunkFeuer. Personal beliefs are manifested on the technical level by the logic of the network. It is the mesh network that says all nodes are equal and when one node breaks down others take over the task. Out of the basic idea of cooperation results the underlying topology. The software is programmed for the hardware. Hardware could theoretically also be used for any other form of wireless network. When I put two wireless network nodes in one room with classical software, they would interfere with one another. FunkFeuer nodes would cooperate." (I4, 23.11.2016)

Although it is barely possible to determine whether the technical level has influenced the theoretical or the other way around, FF members treat both levels with the same relevance. The cooperation aspect simply fits to the worldview of many members. As the example above illustrates, FF aims to create nodes, which cooperate and do not interfere with one another. This basic idea could be transferred to actual members as well. Configuring the node with the isolation principle would not only contradict cooperation, but also disturb self-interest. Self-interest drives cooperation because immense benefits are obtained from the network. Writing Free Software or contributing to wiki-based websites is a process of give and take.

On the one hand, people give away time, knowledge and enthusiasm to create a project everyone can use. At first sight, this non-salaried labor might look consistently irrational and without any aspects of self-interest. It is time-consuming work that reminds one of a Sisyphean task. On the other hand, every input that one makes contributes to producing knowledge, which can in turn be used for own purposes. A wiki-based website, e.g. produces knowledge that people use to inform themselves, which is indeed a never-ending process. Nearly every topic has much room for various interpretations and additional information. Contribution to a certain topic generates new questions and discussions. To contribute in a cooperative way keeps the topic alive and hence puts interests in the foreground.

This same principle applies to any conference that hackers, scientists, etc. attend. There is definitely personal use in collecting information on topics that attendees consume during the conference. Then again, attendees not only collect information, but also share knowledge. To engage with any material alone is considered to lead to routine-blindness. Instead, discussions, debates and conversations refresh the thought process, provide new perspectives and help to make success for personal use. Cooperation means opening up to new approaches, which leads to copious information and again a win-win situation.

> "I have had very compelling conversation with the people from Chaos Computer Club recently. They also had a debate on who is the speaker of CCC? And one said that the speaker is everyone who stands up and says something. When he or she says nonsense people would simply say that is not ok. And that is how our organization works. When someone does something and nobody disagrees, then why not?" (Clemens, 09.02.2016)

In most cases, the limits of cooperation are defined by personal beliefs and values. Thus cooperation means exchanging knowledge and know-how only within the bounds of tolerance. FF's beliefs and values set the tone for tolerance within the organization. One is not obliged to cooperate with a given partner, whereas on the technical level one must remain neutral. FF's nodes cooperate with one another when using typical adjustments without changes.

In contrast, people do have the choice and freewill to adjust technology to their needs. If desired one could easily turn off the connection with a neighbor, or prefer one neighbor to the other. This often mentioned stupidity of technology, which can be fully controlled for own interest, divides ideas of the user from its actual use of particular media technologies. In other words, questions arise such as *how do I program this device? Should I program it for cooperation with other devices? What values and beliefs drive me during the programing process or simply what do I want to achieve?*

Further, the hacker scene and hacker ethics set up boundaries of permitted or tolerated action. It is important to understand though that FF members as well as hackers do not see these boundaries as actual boundaries or restrictions. They even consider them as one of the many freedom achievements that the hacker culture has produced.

First, a given member will not bear any financial or legal consequences due to any disagreements with the majority. Since the mode of communication allows everyone to express own ideas, one does not have to fear exclusion. If actions occur that do not fit to the tolerance boundaries of FF, the majority will not attempt to prove the offender right. However, when someone disagrees with the basic ideas of sharing or democratic principles, they are in opposition to the main tenets of FF and should recognize on their own that the organization is not suited to their beliefs. It is senseless to join an organization, which claims to be a free, open and equal network, if one does not believe in these ideologies. Of course, exceptions would be for missionary or conversion purposes. Thus cooperation is not an emergency solution, but instead an advantage and a chance. When two nodes cooperate with each other instead of interfering with one another, FF's belief is that this interaction is a positive objective fact. The same counts for FS as a recursive public. When FS advocates and developers support the strategy of sharing and openness, companies such as Apple or Microsoft see it as an intrusion into the privacy sphere of the company. Closed systems try to protect specific professional knowledge and define cooperation on their own terms.

Further, hackers do not feel an urgent need to express themselves against the own tolerance limits two by trying to use the meritocratic principle. Although FF is not a hacker collective in the classic sense of the term, members feel overall appreciated. Of course this feeling certainly does not fit for all involved with FF, but the basic consensus among members is that the possibility to have the freedom to express one's own talent and ability is top priority. FF's framework for expressing personal ideas is seen as very flexible and elastic. Cooperation provides help for realizing own ambitious goals. Nearly every member admitted to the fact that as long as one shows patience and perseverance, the opportunity to realize the

project until the very end is given. Such projects as providing Internet access to refugee houses have found like-minded people who are interested in cooperating to reach a goal. In the meantime more and more participants are showing interest in helping with the installation process. Here the cooperation aspect especially affects the use of media technologies. Not only do FF members need the physical infrastructure to put this idea into practice; they also need to acquire new devices to create new nodes. In the next step, refugees cooperate with the FF network by using the provided media technologies. The offered media technologies in the form of hardware and software can only be used with the cooperative aspect in mind. Refusing to help in establishing the node would lead to a lack of an Internet connection. The meritocratic principle includes all participants in the same way and treats cooperative work equally.

In addition, the use of media technologies in a cooperative way helps to establish the personal beliefs and values of FF members. That is, cooperation leads to such already illustrated categories as *freedom, responsibility, independence,* etc. because it builds a basis for the working processes. When transferring the hacker ethic to the FF case, one could easily add *working ethic* in the form of the fundamental willingness cooperate. Since no FF member acts on his or her own and because the working process effectively operates at two levels – which affects software as well as hardware – a cooperative way of using media technologies is indispensable. Moreover, in contrast to the German WCN *Freifunk,* which was founded as a movement, initiative or community, FF is an association with a specified number of members. Thus a cooperative way of using media technologies in FF means sharing a resource with other participants who are eligible to use the infrastructure. Lack of willingness to cooperate would not only harm FF on the social level, but also on the technical level. Although the network is built on use of the sophisticated mesh network protocol, there is always a chance that certain nodes are lost and Internet access in certain areas ceases to exist. To describe it differently, without the willingness for cooperation many personal beliefs and values could simply not be manifested.

> "Our net can work in a decentralized way, but you have to go somewhere to access the Internet. Unfortunately, these entry points are relatively central by now. Our phenomenon is like the Internet, but only on a small scale. The Internet is decentralized in principle, but it concentrates in some areas very, very much. There are some areas in Europe, such as Amsterdam, Frankfurt, and London. So at least you have many metropolitan areas conurbations here. I have been to Australia recently; it is extremely centralized there. That is the difference between technical ideal and economical. The technical ideal would be a completely mashed network, but it is not economical. When I want do a startup in Vienna – not bad. When I want to do a startup in Frankfurt – much better." (I7, 07.03.2016)

Besides being a wireless community network, FF is a platform for business cooperation. It is financed through server housing, and many people attend meetings to find new ways to cooperate with members. Thus while media technologies are the first reason for coming together, the second reason might be commercial interests in cooperation outside of the organization. As net political events or CryptoParties are used for networking, FF's meetings are also a great chance to broaden one's contacts. However, the difference between usual net political events or CryptoParties and FF's meetings is that FF has actual full members and many specific topics for discussion. These meetings and events are freely accessible to all and topics are usually varied. Both types of gatherings have advantages and disadvantages.

Figure 9: Installing software at FF's weekly meeting

FF's type provides a platform for people who already know each other, and also offers the chance for interested individuals to be introduced to other participants and join a small circle of close acquaintances. Weekly meetings are of course open to anyone and mostly focus on a wide variety of discussion topics. Besides that, they create many internal working groups in order to have members who are specialized in each upcoming important topic. In this context, cooperation means breaking down themes and working on them within a specialized work group, whereby some ideas can be further elaborated on even outside of the organization. Throughout this process the already illustrated personal beliefs and values are necessary for

successful cooperation. One certainly would not quickly find a cooperating partner who loathed principles of, e.g. net neutrality or data protection. The scope of possibilities for developing creative ideas and startups usually does not contradict the basic philosophical foundation of the organization. It is probably similar to a scientific conference with free entrance where in the end people from various disciplines find themselves among people from their own discipline. People without any type of scientific background are not excluded, but often experience difficulties in finding topics for discussion and further cooperation. Thus a professional background is certainly important for smooth operation and cooperation, but surely not the most necessary factor.

Conversely, net political events or CryptoParties especially invite those without technical know-how in order to attract a wide audience. The goal is very often to explain and describe the complex net political processes, encryption and technology in a clear and straightforward language. Since these events and meetings do not occur within one organization, as in the case of FF, they usually remain on the very basic and surface level. Of course some hackers cooperate with each other and work on various tasks, but the main goal of such events is to provide solid information and offer a platform for the exchanging of information, i.e. to create an atmosphere of learning by doing and to facilitate an open floor for those with net political knowledge to present ideas. Thus even when upon first glance it looks very similar to meetings of FF, the process differs. FF is not interested in cooperation with people related to the politics of Internet development; focus is rather in very special areas that could potentially benefit FF's network.

From FF's view, media technologies are used as a tool in a cooperative fashion. And because cooperation always means a win-win situation, one should not harm the freedom of the others.

> "One person's freedom ends where another persons freedom begins. If someone has a completely different notion of freedom, then he or she will not be a success in the organization. If someone would like to join FunkFeuer in order to gain world domination, then FunkFeuer members probably would have been laughing about it for a long time. If this person would be really serious about it, then members would say that he or she does not belong here. As in any other organization, people here have a goal and an understanding of compatibility." (I5, 07.03.2016)

Especially *freedom,* as a category of FF's personal beliefs and values, should not be harmed under any circumstances. Although the notion truly works on the theoretical level, it is often difficult to recognize on the technical. Only by using examples such as unethical shouting in a crowded room – which would lead to a breakdown of the system (chapter 4.2) – are we able to make the parallel between cooperation on the theoretical and technical level. FF members

often wonder why some rules are obvious when dealing with actual human beings, but are difficult to grasp on the technical level. Making comparisons, examples or inventing stories leads to demystification of the world among media technologies. FF's tries to go back to historical processes, find examples in the animal world, or draw comparisons with examples from today's world where media technologies do not play a role.

In the same way that Daniel Miller and Heather Horst (2012: 4) determined that today's humans are definitely not more mediated than humans from the pre-digital time, FF's notion of life in the middle of media technologies does not make humans more mediated or different to the past. This discussion bothers many active participants because they often try to find new ways by learning from the past. In this day and age, one needs to simply transfer certain scenarios and incidents from the past to the present while keeping modern technology in mind. For example, the Roman Empire had sophisticated technological developments and certain rules and modes of communication from which we can currently learn. Perception of the Internet as a natural resource allows freedom of thought in constructing different examples by substituting one resource for the other. Even the fact that the principles of the Internet are referring to democracy, a system that was created in Ancient Greece, shows the continuity of some basic worldviews, goals and interpretations. Sometimes participants ask themselves questions such as *how did our ancestors manage to talk, cooperate and work back then? If the Internet is just a natural resource, does it make sense to look at other natural resources (e.g. trade routes over the water during the Middle Ages) from the past and apply them to the present digital world? What about the networking structures and cooperation of ants? Can we learn something as human beings from animals?*

From time to time FF members perceive such fundamental debates on principles as refreshing and a means to escape routine-blindness. Such perennial terms as freedom, philosophy, democracy, independence, etc. motivate them to take a look at non-digital environments and search for inspiration. The approach though follows neither a strict plan nor chaotic trains of thoughts. It is rather a way to stay creative and look forward by looking backwards or even somewhere to the side. It is an attempt to go through the world with open eyes. Even unsuccessful examples and incidents teach the avoidance of particular strategies and systems. Besides the goal of finding answers, it is also to uphold the natural dynamic culture of discussions and debates within the organization. The lack of a moderator during group discussions provides the freedom to start with one specific issue and end up with a completely new one. Cooperation among participants certainly follows the same rules of dynamics and flexibility. It is a process of creating and recreating or using and reusing at the

same time. The cooperative way of using media technologies makes them further flexible to any changes. It is the same principle of the lack of the moderator, when FF members are utilizing media technologies. The constant cooperative way of writing, e.g. software, leads to the constant and dynamic creating of different configurations, objectives and updates.

Trust and *cooperation* are two essential integral parts in the many ways of using media technologies at FF. They both form a usage that cannot exist without the other. From FF's perspective *trust* leads to *cooperation* and successful *cooperation* leads to *trust*. Both components influence each other and build an important cornerstone for the organization.

6) Discussion of the Results

FF's difficult to grasp and constantly changing processes were presented mostly in two ways: First, by emphasizing and showing the varying and challenging to comprehend character of the organization in comparison with the anthropological theories applied among other hacker collectives; and second, by focusing on those material aspects which do not change, or change only to a certain extent. Such aspects like rooftops, meeting locations and – to a certain degree – hardware, helped to elaborate on a perspective for discussing media technologies as material culture. The sometimes surprisingly accordance of anthropological theories and FF's views raises various further questions and issues to discuss.

The self-evident link for nearly all conversational partners between online and offline platforms relates back to the tech-savvy background of most participants. However, the conversation mode online and offline has its differences. Although FF members would certainly not question the authenticity of a member when talking on the Internet, they do agree that behavior on- and offline might differ. By scrutinizing the chatting habits of the youth culture in Indonesia, Martin Slama has shown in his ethnography that the inhibition threshold of young users to raise private topics on the Internet is much lower than in life offline (Slama 2010: 316). FF members express the complete opposite. They would rather have a discussion or conversation offline than transfer all sensitive issues to an online form of communication. A conversation offline is not perceived as more authentic, but simply as more prolific and secure. FF member enjoy the possibility to meet other members in person and talk, program or tinker over a drink. When mailing lists and other online forms of communication are in the most cases strictly reserved for discussions related to technology, personal meetings have more the character of a party, hanging around or mindlessly working on a task.

Since FF is not only limited to programming as in the FS case, face-to-face meetings are indispensable. It might be true though that online behavior is left for personal and private topics as in Indonesia, but because the focus of the present study was only among participants, private online behavior outside the organization was not illuminated. Within the organization, members are fond of company, especially when meetings have a clear working purpose on a certain issue. The illustrated feelings that come from freedom on rooftops or the creation of own software or hardware are nearly all related to face-to-face interactions. Thus the FF case offers a unique opportunity to research both an online and offline presence at the same time. As one conversational partner has admitted, it is a unique opportunity to understand the global gigantic network called the Internet by simply analyzing FF as a small

case study.

The categories of personal beliefs and values are very starkly interwoven and often difficult to distinguish. Here the attempt was made to describe them in FF's own terminology, and depict them in accordance with members' thought processes. Some important beliefs and values such as *hacker ethics* were not included as an own category because they have not been perceived as a category in need of explicit discussion. FF members do not follow these ethics in the sense of the Ten Commandments or any other religious rules. They are rather a required and unuttered way of thinking that promotes a feeling of integration in the organization, and they certainly do not impose strict rules to follow. Although they are probably the basis of a serious philosophical and theoretical foundation that expresses the values of FF, their significance does not play a central role in everyday life. The empirical part of the study from time to time references these ethics, but only when it is especially necessarily in order to follow a specific train of thought. Thus *hacker ethics* are not apart of the personal belief and values of FF members that are in need of discussion and debate. Instead they have been intensively involved with the presented categories for years and bring up again and again some of these topics for renewed debate.

The connection between personal beliefs and values and certain ways of using media technologies was mostly perceived among participants in two directions. First, some participants criticized this connection as being too narrow in context. The already illustrated fear of having a label moves them to think beyond any categorizations, connections and conclusions. From their perspective, FF is no more or less the same when compared to any other organization with its own dynamics, such as sports club, and it is too far-fetched to make a bold statement that FF can fulfill the role of generating valid scientific research and breakthrough discoveries. The line of this argumentation is very often limited to deconstruction of nearly all terms, concepts and ideas. As soon as something is defined, it immediately ends up in deconstruction and creates vagueness in order to avoid one certain label. Thus the connection between personal beliefs and values is recognizable, but the attempt to grasp and explain it would lead to failure.

Second, other participants reflected precisely the contrary and portrayed their secure feeling of recognition of the manifestation of personal beliefs and values by certain ways of using media technologies. Mesh network protocol for instance was often addressed to influence the thinking and feeling of a true network. Programming and adjustment of media technologies accurately reflects their beliefs, and additionaly media technologies accurately reflect personal values. Members who belong to the second direction express furthermore the

notion of technology as neutral. In fact, they are concerned that technology can easily fall into the *wrong* hands and be used for malicious activities. Thus personal beliefs and values are what adjust media technologies and guide the decision of which road to take. However, whether or not technology is adjusted for malicious or non malicious activities, as in the FF case, it can be used to further influence people's minds. In contrast to the first direction, these people place a great amount of power in all the possibilities technology offers.

The sharing processes of Internet access were discussed throughout the whole empirical part of the work and especially in relation to the collective construction of an idea of independence among may other ideas. It was possible to illustrate the members' notions of independence by creating an own category and chapter particularly focused on this issue. However, it was quite difficult to discuss this sub-question because sharing processes are nearly impossible to grasp. It was much more productive to depict personal beliefs and values in relation to sharing aspects, instead of focusing only on sharing processes among participants. All categories are much more interwoven than expected prior to research and during the research process. Thus sharing aspects do not only play a significant role in collective construction of an idea of independence, but also in any other ideas such as *freedom, responsibility, etc*. Moreover, such categories are more than simply theoretical ideas, and have been presented as actual personal beliefs and values.

Besides that, topics concerning hierarchical and nonhierarchical power relations are addressed time after time throughout the ethnography in order to throw light on them from different angles. Since hierarchy is an extremely sensitive issue for nearly all hacker collectives, it presents a particular challenge for the researcher to find ways to illustrate it from an internal perspective. The general reluctance towards pyramid-shaped structures is an ambivalent attitude and certainly not a personal belief or value. People agree because, for many other structures, hierarchy has its advantages and disadvantages. Among some members over the past three years I have noticed a small shift and increased openness towards classical models of organization. The often-portrayed frustration resulting from unrealized projects, which leads further to cynical statements, gave some members – as an example – the idea of pursuing commercially successful projects. When three years ago nearly all members were totally opposed to various remuneration structures, some members continue to address this issue from time to time. To be paid for work does not necessarily mean giving up one's principles and values. Nevertheless, the prevailing opinion towards any commercial tasks is still quite skeptical and disapproving in most cases. Even when some commercially successful projects look tempting at first glance, many members do not share the view of becoming a

commercial organization, as this would contradict many aspects of FF's personal beliefs and values. It is a feeling of standing on the edge. Either the organization will remain standing and nothing will change, or they will risk taking a leap into the unknown and see what happens.

Apart from these structural developments of the organization, results have shown the anthropological methodological relevance in approaching media technologies. With focus on the mundane use of media technologies and participant observation in a wide range of activities offered by FF, *trust* and *cooperation* have emerged as the most essential components of network maintenance. These complex and at the same time simple characteristics were hidden at first behind theoretical and philosophical concepts on very abstract levels. It appears simple because of its obviousness for smooth operation of any successful working processes in general. On closer inspection, however, these terms can surely be discussed on an abstract level. In this context, all everyday lives with social interactions are based on trust and cooperation. Therefore, it is particularly astonishing to obtain such results when studying modern media technologies.

The way FF members think often unwittingly overlaps with theoretical perspectives of Media Anthropology. Not only in realizing the connection between online and offline lives, or disagreeing with the view that pre-digital humanity was more authentic, but also in pursuing such basic aims of Media Anthropology as the necessity "to expose the agents, aesthetics, politics, and economics behind the technologies." (Askew 2002: 2). One of the conventional wisdoms among anthropologists is that other people usually do not really know what Anthropology is and wonder why they study media technologies instead of *tribes* in remote areas (URL 24). FF members broke this misconception by showing no surprise when the majority of conversational partners began without prompting to discuss social and cultural aspects of media technology. In addition, net activists such as Thomas Lohninger exemplify the high relevance of Anthropology for showing success in technical environments.

Those who do not express interest in joining FF, and despite a lack of technical knowledge show interest in the organization, especially want to know how the network works and what reasons members have for joining. Thus conducting ethnographic fieldwork within a technical environment requires understanding not only of technical basics and even refinements, but also a mastery of a specific language in order to fully participate in all upcoming tasks. An organization that claims to be free on the technical level catches the interest of people who are trying to understand how it is possible. How is it, e.g. possible to simply disconnect from one infrastructure, connect to another and obtain more freedom, anonymity and independence? The close relationship between materiality and immateriality is

in FF's case even more evident when materiality of infrastructure plays a significant role for interested persons in understanding various immaterial claims on the ideological or philosophical level.

Existing anthropological concepts and discussions on hackers and/or tricksters – which were illustrated in the theoretical approach in detail – provide a solid and profound theoretical approach for understanding certain actions of participants. Especially hacker humor, which Gabriella Coleman has illustrated at length in her ethnographies, very often drives FF members to creative actions such as modifying or reusing technology for other purposes. For many members, being creative simply means completing various tasks in a humorous way. Thus the classical notion of tricksters as persons who are often not punished for trespassing norms and laws (Mader 2008: 101) fits to FF members only in the sense of adapting media technologies for own usage. They improvise technology in order to keep the network alive, and trespass norms in a creative manner.

In contrast to these actions that are closely connected to hacker culture, it is nearly impossible to analyze the intra-organizational power relations using common concepts of hacker culture. The organization has its own history, developments and power relations that have been produced over a long period of time. It requires full ethnographic fieldwork with a single focus on all processes concerning the board of the organization. However, results have shown that being on the board does not necessarily mean having more power, since the structure of the organization is based on illustrated personal beliefs and values and certain ways of using media technologies. Hence such an ethnographic fieldwork would mean studying modes of behavior of a small amount of people on the board without any connections to other relevant fields of research. In other words, power relations among certain people would decrease the relevance of such an ethnography, at least within the subfield of Media Anthropology.

Being away from mainstream developments concerning the Internet, FF members express a more meditative and thought-provoking way of analyzing global net processes. Daniel Miller (2016) has spoken about the stark changes in the perception of the Internet over time. For FF's scenario though these changes do not apply. Their specific way of using media technologies based on trust and cooperation transfers them to an area with their own trends and tendencies. News concerning legislation of WCNs is perceived as more essential than fast-changing trends of mainstream net politics. The idea of independence even makes it possible for FF's network to exist independently from access to the global network. Thus the notion of the Internet can vary from one ISP to another. It is particularly useful in such cases

to focus on ways in which media technologies are used among different groups in order to understand what different notions, trends and worries these groups might have. The inside view of FF has shown that nearly every common idea such as *freedom, responsibility, independence, etc.* have their own understanding, notions and approaches. Following Miller's (2016) advice of looking at the actual people behind online activities with such questions in mind as *who they are* or *what do they do*, FF provides an ideal possibility for witnessing both these aspects. FF members ask questions like *who are other members* and *what do they do* themselves, which leads to *trust* and *cooperation*, assuming the answers are satisfactory.

Discussion of the main research question shows furthermore the high significance of studying such small Internet phenomena as the FF case, and brings wider relevance by applying forms of regional and distant comparison (Gingrich 2012: 201-202). Since FF members have often compared their similarities and differences to their German, British, Greece, Spanish, etc. equivalents, one could relate this ethnography as a Viennese case to other documented cases of WCNs or *libre Internet* in the wider region and beyond. In addition, such topics as FS, hacker culture, net activism, etc. give WCNs a multilayered nature for discussing various research questions in multiple contexts. It is particularly important for anthropologists to follow all these questions in order to grasp the rapidly changing modern media technologies.

Putting the focus on personal beliefs and values, and ways of media technology use has allowed the present thesis to demonstrate a specific anthropological contribution to media studies without going into detail in describing the working processes from a technical perspective. Nearly all FF members argued that the Internet has become undeniably an essential part of our everyday lives. That is why people often negotiate a real confrontation with something that appears so self-explanatory. New applications, new software, new video games and other products usually define the user's approach to computer devices. However this ethnography plunges into the active part of media technologies where people really create, build and structure them. It depicts people who are actually behind the often-claimed impersonal, anonymous and unauthentic digital world, and reflects according to Miller & Horst (2012: 3) the ultimate task of Anthropology as a discipline in terms of what it means to be human, especially when interacting with other humans and the environment.

In summary, the FF case has shown not only the ambivalent notions of online and offline, but also the importance of personal relationships when using media technologies. Some as it seems abstract and immaterial ideas in the form of personal beliefs and values may influence the use of material objects as well as the other way around. By highlighting the

strong connection between real and virtual, a further contribution is made to anthropological disbelief in the more authentic and natural predigital world.

7) Conclusion

Recent years have surely increased the popularity of alternative ways of using media technologies. There is high interest among many Internet users to learn new applications and devices, and understand the politics of the complex digital world. The number of participants at CryptoParties and other meetings has continued to grow. Further, the founding of monthly net political events in Vienna has attracted many visitors during the course of my research. Especially newcomers are searching for experts to provide simple answers on how to correctly use the Internet. Frequent reports in the news on data theft, viruses, shit storms, etc. motivate people to come to such meetings and events and learn the basics of proper Internet use. Some events are even organized at schools in order to teach pupils the manifold ways of entering online environments without fear of being misused. Organizers try to simultaneously increase user sensitivity towards privacy, security, and the incredible freedoms and benefits that computers might bring. Often it is already enough to simply demonstrate various vivid good and bad examples of genres of usage and the resulting consequences.

As Miller & Horst (2012: 29) formulate the future of Anthropology in studying how things become rapidly mundane and their cultural genre of usage, organizers of net events are wondering how media technologies have become so *normal* in record time. In other words, many people have integrated computer devices into their mundane lives without questioning the structure or mechanics behind this technology. The genre of usage is very often limited only to passive consuming of certain application software. However, people like Edward Snowden, Julian Assange, Chelsea Manning and others, have increased awareness and self-reflection about own usage of media technologies, or at least have sparked interest in the field of cybersecurity and the handling of computers in general.

This study began with the understanding that it necessary to inform oneself of all ongoing debates concerning net politics in order to study FF; however net activists would probably abbreviate this phrase after *net politics* because from their point of view it is necessary for all citizens to familiar themselves with net politics no matter whether FF is being studied or not. Thus it is no surprise that Thomas Lohninger went *native* while conducting ethnographic fieldwork on hacktivists. Participation is irreplaceable when attempting to experience moments of clarity and to really shape online/offline worlds. This ethnography aims to put the non criminal aspects of hacking culture – which I have had the pleasure to get to know over seven months – in a more positive light, and to make a contribution to the still slightly small subfield within Social and Cultural Anthropology that deals with media technologies. It further gives the first anthropological insight into the

hacking scene in Austria and Vienna in particular, and provides the first anthropological basis in studies on WCNs, which are without a doubt a broad field for further future studies. Anthropology for its part provides a long tradition in studying material culture, technology or sharing processes and can make a huge contribution to any studies dealing with media.

Further, I would like to bring up the issue of the tradition to openness as understood by both FF and hackers, and relate it to scientific research. The immense benefit of conducting fieldwork among hackers is fast acceptance within the group. The culture of openness has advantages for the researcher and participants. Not only have I learned many useful computer skills and gained much knowledge during the course of research, but FF members have also found an assistant, helper and conversational partner during their tasks. Beyond that, the culture of openness and open access in particular supported me during the research process with literature, articles and all necessarily information for my research.

Having the possibility to download nearly any required documents has presented an enormous and noticeable benefit during the research and writing process. Thus the fast and vivid exchange of knowledge amongst hackers was also transferred to academic writings. For example, during my research process Daniel Miller released his new book *Social Media in an English Village* in open access and reached 3.5k downloads in the first week (URL 26). This surely is a topic deserving of its own research, but I was able to witness the tangible positive impact of the hacker's notion that all information should be free, especially when discussing any upcoming questions. In the end, one is nearly always doomed to fail in making predictions for future developments. However, by attempting to at least provide an outlook, scientists will be kept busy with media technologies for a very long time. Since the trend for quantitative research or Data Science continues to grow when dealing with Big Data, anthropologists such as David Hakken plead for qualitative methods. Transdisplinary collaboration with other academic fields would present especially prolific results – since a great amount of Data Science research is epistemologically blind in Hakken's experience – and a qualitative approach could provide some insight. One should not simply claim that Big Data and Data Science are the only ways to understand human behavior.

> "Such claims become more than annoying for me when it is asserted that the Big Data/Data Sciences uniquenesses are such that those pursuing them need not pay any attention to any previous attempt to understand human behavior, that only they and they alone are capable of placing the study of human behavior on truly 'scientific' footing, again because of their unique scale." (URL 27)

I further believe that Anthropology can provide orientation within the huge amounts of today's quantitative data and give an overall picture by writing well-tried ethnographies.

Abbreviations

CCC	Chaos Computer Club
CIA	Central Intelligence Agency
DIY	Do It Yourself
FF	FunkFeuer
FS	Free Software
GPL	General Public License
HD	High Definition
ICT	Information and Communication Technology
ISP	Internet Service Provider
IT	Information Technology
NSA	National Security Agency
OS	Open Source
PPA	Pico Peering Agreement
WCN	Wireless Community Network
WWW	World Wide Web

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Abstract

Participation in the Wireless Community Network "FunkFeuer Wien" enables the building of one's own physical infrastructure. Installation of new nodes on rooftops in Vienna expands the network, allows for the obtainment of Internet access alternatively to commercial Internet Service Providers, and attracts the high interest of hackers, programmers and also not so tech-savvy individuals. This ethnography explores the people behind this network, investigates their personal beliefs and values, and discusses their certain way of using media technologies. It further gives insight into anthropological perspectives on media and modern technological developments and illustrates the intersections of different Viennese hacker collectives. "FunkFeuer" is an Austrian organization, which has started a movement that is reminiscent of the main principles of Free Software, with "free" referring to freedom and not price. This thesis captures the many ongoing processes of "FunkFeuer" and makes a contribution to anthropological studies on hacker culture, media, and Internet activism.

Keywords: hacker, Free Software, Media Anthropology, Internet activism, material culture, communities, infrastructure

Zusammenfassung

Eine Teilnahme am freien Funknetz „FunkFeuer Wien" ermöglicht das Anbringen einer eigenen physischen Infrastruktur. Das Installieren von Knoten an Dächern Wiens erweitert das Netzwerk, macht einen alternativen Internetzugang zu kommerziellen Internetdienstanbieter möglich und erweckt das Interesse von Hackern, Programmierern und auch von nicht technikaffinen Personen. Folgende Ethnographie erforscht Menschen, die hinter dem Netzwerk stehen, untersucht ihre persönliche Überzeugungen und Werte, und diskutiert ihre bestimmte Art und Weise Medientechnologien zu nutzen. Darüber hinaus gibt sie einen Einblick in anthropologische Perspektiven auf Medien und moderne technologische Entwicklungen und stellt die Überschneidungen von verschiedenen Hacker-Gemeinschaften in Wien dar. „FunkFeuer" ist ein österreichischer Verein, der eine Bewegung ins Rollen gebracht hat, die an die Hauptprinzipien von Freier Software erinnert, wenn „frei" im Sinne von Freiheit und nicht Preis zu verstehen ist. Diese Arbeit erfasst die vielen laufenden Prozesse von „FunkFeuer" und leistet einen Beitrag zu anthropologischen Studien zu Hackerkultur, Medien und Internetaktivismus.

Schlagwörter: Hacker, Freie Software, Medienanthropologie, Internetaktivismus, materielle Kultur, Gemeinschaften, Infrastruktur