The IRC paradigm
An alternative approach for alternative social networks

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Abstract

Alternative social networks are often presented as a way to save us from the top-down, opaque way of social networking presented to us by social media behemoths such as Facebook and Twitter. Whereas these have a software ecosystem as closed as it gets, alternative networks often employ open source software en store user data in a transparent way. Yet in practice many of the patterns found in mainstream social network platforms still apply to alternative platforms; software development is controlled by a small group of people and there is no easy way for users to really customize their experience to their liking. From a user empowerment perspective, the IRC protocol offers an interesting paradigm with regards to developing a social network software ecosystem that could be inspirational to social network platforms in general, as it allows for a high degree of customization and user involvement in software development. In this report, I explore how this paradigm relates to the status quo in alternative social network development and what lessons can be drawn from it.

Keywords

Metadata

The IRC Paradigm: An Alternative Approach for Alternative Social Networks

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Introduction

It's become an almost reassuring ritual: whenever Facebook changes its layout, adds a feature or modifies its privacy policy, the internet will quickly be filled with people screaming bloody murder, sharing ways to keep using the older settings and setting up petitions to let Facebook know that this time they've really made a mistake.

In the end, Facebook usually pushes their changes one way or the other and inevitably, the process repeats itself after a few months. It is amongst other things this practice – a social network changing its service and conditions without consulting the users – that has fostered the emergence of so-called "alternative social networks". Such networks often allow people to socialise online like on Facebook and other big, monolithic networks, but also offer people more choice with regards to customizing their experience and managing their personal data.

However, even these alternative networks are often rather similar to Facebook with regards to the features they offer to users; friend lists, group pages and personal "walls" have become a staple of services both alternative and mainstream. At a glance, it would therefore be easy to conclude that this is all there is to social networks online. Even on these alternative social networks such as Diaspora[1] and Lorea[2], the user experience is to a large extent fixed on the template set by current and previous social networking giants.

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1   https://joindiaspora.com/

2   https://www.lorea.org

There's more, though; when looking further than just the immediately obvious, there are several services and technologies that do not fit in the Facebook-sized box. A peculiar example is IRC, or Internet Relay Chat. First developed in 1988, which makes it almost prehistoric by internet standards, this chat protocol continues to enjoy a niche popularity and still boasts hundreds of thousands of concurrent users. IRC users connect to an IRC network, where they join a chat channel – often specific to a certain topic or community – and take part in discussions with other people in the room. People often stick around in certain channels, which fosters a sense of community with the other people present.

This makes a good case for seeing IRC as a social medium and, given the way users gather in specific rooms and form ad hoc communities, perhaps even a social network. Yet it is fairly different from the current "big" social media such as Facebook in the way it is set up and the software for it is developed and released; there is no central authority or entity that develops the software or controls the networks, and much of the software used by IRC users was made by these users themselves. This is especially interesting with regards to "alternative" social networks such as Lorea or Diaspora, which often claim to offer a higher grade of user empowerment. At the same time, these projects are often – as I will argue in this article – quite similar to the larger, more mainstream networks in several aspects, some of which in fact impede the ways in which users can have a say over their social network experience. Perhaps taking a page out of IRC's book could be beneficial to these alternative networks with regards to increasing user empowerment.

In this article, I will therefore explore what features or paradigms specific to IRC could be beneficial for wider use within alternative social networks. It can be expected that the user-driven development and, importantly, deployment of features on top of the IRC protocol both fosters a sense of community

and allows for a feature set that is customizable enough to satisfy all involved users. As such a degree of user involvement has not been employed by any (alternative) social networks yet, this can be a viable new approach for them.

I will first attempt to establish a clear definition of what "alternative social network" actually means. To do so, I will first explore the general definition of what a social network is. As a starting point boyd & Ellison's general definition will be used, taking into account the criticisms it has received from David Beer and Thelwall. Having established this, I will investigate in what way alternative social networks are different from "mainstream" social networks. I will then take a look at how the way the software alternative social networks run on inhibit or enhance user empowerment, a core value of many alternative social network sites.

I then turn to IRC and analyse how the protocol makes for a software ecosystem which fosters user empowerment. I compare this with FOAF, a prominent example of an approach to social networks that resembles the "IRC approach" in some aspects. I specifically focus on the role network architecture plays, as it is one of the major differences between the two technologies. Based on this analysis, I identify strengths and weaknesses of FOAF – as a prominent example of an IRC-like approach to social networks – with regards to its suitability as underlying technology of a user empowering social network, based on my analysis of what makes IRC's approach successful.

What is a social network?

Most social networks – from Facebook to Lorea – take the shape of a website reached via a web browser where users can access a list of connections, get an overview of what these connections have recently contributed to the network and engage in conversation with them. Specific features often vary, with most social network sites (SNS) having a specific focus and unique features catering to that focus.

When considering such SNSs, it is important to have a clear definition of what exactly a social network site is and – equally importantly – what it is not. The obvious first place to look for a definition is danah boyd and Nicole Ellison's aptly named *Social Network Sites: Definition, History, and Scholarship* (2008). In this paper, the authors attempt to draw clear boundaries around the concept of social networking and offer an overview of the history of social networking until 2008. In the end, boyd and Ellison define social network sites as:

> [W]eb-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. (211)

In other words, the defining characteristic of a social network service for boyd and Ellison is that they make the social graph of a network explicit and easily visible, for example via a friends list or a time line of friends' updates. The

social graph, the set of relationships between people in a network, is indeed an important aspect of many social network sites: Facebook for example explicitly mentions it in the name of their way of giving programmers access to their data – the Graph API [3].

On the other hand, there are multiple online services that would fit boyd and Ellison's definition of a social network service and yet are often not considered to be one. YouTube, for example, allows for profile pages and friend lists, but is still first and foremost a site where one shares videos, and it does not have its social network features at its core like Google+ or Twitter do. In this way sites like YouTube and other services with "tacked on" social network features, like Flickr, seem to be in a different category than more "pure" social network sites such as Facebook.

Boyd and Ellison themselves make a careful distinction between social network sites and social network*ing* sites, and note that the latter label would imply that "relationship initiation" is a core activity, while on most services users do not initiate new friendships as much as they stay with the same group of friends they already have (211). This distinction however says nothing about whether having socialising features such as friend lists as a *primary* focus is a factor in being considered a social network service. As boyd and Ellison also consider sites like YouTube, Flickr and Couchsurfing to be social network sites it seems that in their definition, this is not to be the case; merely having social features as an option is enough.

David Beer, in response to boyd and Ellison's article, argues that for this reason their definition is too broad, and that a more fine-grained classification is desirable. Beer claims that a mere distinction between social network sites and

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3   https://developers.facebook.com/docs/reference/api/

social network*ing* sites is too simplistic, exactly because sites like YouTube defy such a binary classification, and that given the differences in implementation of social features on different sites a more sophisticated typology is required.

An attempt at creating such a typology is made by Mike Thelwall in his 2009 text *Social Network Sites: Uses and Users*. Thelwall acknowledges Beer's criticisms and proposes three broad categories of social networking sites, based on the functions the social features of an SNS fulfil:

Socialising SNSs, where the main purpose of the social features is "recreational social communication" and the maintenance of existing social ties; examples are sites like Facebook and Bebo[4].

Networking SNSs, similar to what boyd and Ellison describe as social networking sites, where the primary function of the social features is forging new social ties. An example would be LinkedIn.

Navigation SNSs, where the focus of the social features is to discover relevant information or resources; for example, all blog posts written by a friend, or all status updates from a certain celebrity. On sites like Reddit or Digg, for example, it is possible to view all links recommended by a specific user (23).

In this typology, the distinction between sites like Facebook and YouTube is clear; while Facebook is an archetypical socialising SNS, YouTube can be classified as a navigation SNS, where the primary purpose of the social features is to discover interesting videos or playlists. Thelwall notes that the distinction between the three types is often a matter of user intentions: a social network

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4   http://www.bebo.com/

site may facilitate all of the above-mentioned functionality, but users often use a network mainly for one specific purpose (24).

As will be discussed in the next chapters, the Socialising SNS is by far the most popular kind of SNS in both a mainstream and an alternative context. Additionally, IRC is mainly used for "recreational social communication" and lacks features that would make networking and navigation convenient. Therefore, this paper will be concerned with Socialising social networks, or social network sites used primarily for socialising; likewise, the chief topic of investigation will be whether IRC's paradigms can be of use to alternative social network sites in a Socialising context.

What is an alternative social network?

The preceding analysis sheds some light on what exactly a social network is, but does not clarify the difference between mainstream SNSs and alternative SNSs. What makes a social network alternative? Is it the numbers of users, is it whether it's owned by a corporation, is it the amount of money the holding company makes or whether the software used is open source?

There seems to be no agreement on what makes a social network alternative in scholarly literature. Pinpointing the distinction between "alternative" and "mainstream" has been an issue in many other fields as well - music, press, medicine, all deal with "alternatives" that often seem to elude a precise definition. The vagueness of the term has led to authors like Richard Abel proclaiming the uselessness of the distinction in general (79). Yet there is a clear, though at first glance perhaps intangible difference between a network like Facebook and a network often billed as "alternative", like Diaspora. As this intangible difference is often reflected in discourse, where the contrast between mainstream and alternative is often used, it is fair to say that this distinction is not wholly useless in case of social networks. It is, however, important to have a clear idea of what this distinction precisely is. Reading texts about alternative social networks, there are three major aspects that are often mentioned as being a space where "mainstream" and "alternative" social network sites are different:

Network architecture – Alternative social network sites often employ a federated or decentralized architecture, as a response to the centralized architecture of mainstream networks (Narayanan et al). While Facebook, for example, is a centralized network, with all data stored on a central server controlled by Facebook, projects such as Diaspora pride themselves on the fact that they employ a federated architecture (Hui & Halpin 107). This federated (or decentralized – the terminology that is used is often confusing, cf. Peeters) architecture ensures users that their data is not controlled by one single party, an attractive premise for those concerned about the effects of social media usage on their privacy.

Business model – Another point often made about high-profile social network sites is that they run on a for-profit business model, and therefore the desire to create a network that generates as much money as possible often inhibits users' rights and possibilities (Langlois 51, Sevignani 325). Indeed, networks considered to present alternatives to Facebook or Twitter are often run by volunteers or a non-profit organization or use a freely available open source software platform such as Elgg [5]. This means such networks are free from the influence of advertisers and other parties with a purely financial motivation, meaning they can put more focus on other aspects such as user experience (Sevignani 330).

Openness – A third commonly heard criticism of mainstream social media sites is their closedness, both with regards to the software they run on as well as the way they treat their users' data. As mentioned before, many alternative networks use open source software and a data architecture that allows for greater transparency of what happens to users' data (Van der Velden 315). Especially with regards to privacy this can be an attractive feature and a way for new social network initiatives to distinguish themselves from the mainstream.

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5   http://elgg.org/

Conspicuously absent from these analyses is the actual feature set of the social network site – the functionality used by the everyday users. The above three factors do not have much impact on the actual experience of the users of the social network; the way they interact with each other and the opportunities offered by the social network for sharing rarely go beyond what the big, established social networks have to offer (Hui & Halpin 110). Hui and Halpin remark that this represents an opportunity for alternative social networks: rather than focusing on the underlying technology, it would be worthwhile to focus on developing alternative ways of online social interaction online, as this is where alternative networks could really make a difference (115).

At this point, however, the "alternative" in alternative social networks seems to be mostly about ideological or technical issues, rather than about distinguishing oneself from the mainstream on a feature level. Those social networks considered to be alternative, then, will usually have a combination of these three characteristics; a federated network architecture, non-profit business model, an open source software platform and/or transparency with regards to user data storage.

These factors tie in directly with another common difference between mainstream and alternative social networks: the amount of users. Due to the relatively high technological entry barrier (no central server often means having to choose between and cope with multiple choices of server, e.g. Diaspora and Lorea), a relatively low user-friendliness common to many open source projects (Lerner & Tirole 203) and the network effect that in turn ties in with these difficulties, alternative social networks are generally a lot less popular than mainstream networks or mainly popular within specific niches.

Yet within certain niches where these considerations are less of an issue, alternative social networks can thrive. Lorea, according to its developers, has a

small but dedicated core community that constitutes a stable user base of over 40.000 mostly Spanish people (Cabello, Franco, and Haché 344). Lorea, or at least a subset of its nodes, focuses specifically on an activist crowd and attracts people that are willing to put up with some inconveniences in exchange for the knowledge that their data is safe and they have an open platform for discussion with like-minded people (ibid.; Hui & Halpin 113).

An alternative social network then is a network that has a network architecture, business model or transparency policy that is at odds with the larger social networks such as Facebook and Twitter. This means that the label "alternative" is partly defined by whatever network is "mainstream"; the labels define each other. The three factors mentioned can have implications with regards to usability, which in turn may result in modest user adoption, but as can be seen in networks like Lorea this still allows for sustainable communities.

Alternative social networks and user empowerment

The label "alternative" already suggests a purpose through its wording: namely, providing an option that is different from the one offered by mainstream networks. In the case of social networking this option often seems to entail user empowerment, shifting some of the control over the social network experience from the network to the user. For example, the website of alternative socialising social network Diaspora greets visitors with the promise that Diaspora is a "fun and creative community that *puts you in control*. (emphasis added)"[6] Likewise, GNU Social states that "Social networks should … allow you to control what you put into them, and you should be able to keep control of your own data."[7] User empowerment is also clearly an important theme looking at the list of three common characteristics of alternative social networks found in the previous chapter. All three characteristics essentially seem related to it – a decentralized network architecture allows for more user control over data; a not-for-profit business model is often expected to lead to more attention to users' needs and desires; transparency of data and open source

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6   http://diasporaproject.org/

7   http://www.gnu.org/software/social/faq.html

development supposedly allows for user involvement with the software the social network runs on.

User empowerment and the bottom-up approach

User empowerment often goes together with a "bottom-up" ethic, where the network is not shaped based on the wishes of a single, often corporate entity, but by the users themselves; a commonly used way to achieve this is an open source development model. Such a model (which most alternative social networks employ) theoretically allows anyone to contribute to software projects and thereby would allow any user to have his or her say in the features and possibilities offered by the social network software in question (Dixon 2). This sounds empowering indeed, and appears to fit the bottom-up label quite well; instead of Facebook, Inc. deciding what your social network experience will be like, on many alternative networks there is an opportunity to shape it yourself.

Yet it has been shown that even in an open source development model the vast majority of users do not get to contribute to the software; in a power law-like distribution of labour, usually only a very limited amount of people make by far the greatest amount of contributions to open source projects (Krishnamurthy; Ghosh and Prakash; Mockus et al 321). Moreover, in open source development models the process that determines which features get implemented often in practice amounts to most developers implementing primarily those features they personally would like to see (von Krogh et al. 1230; von Hippel & von Krogh 216; Mockus et al. 310-318). Combined with the fact that only a fraction of a product's users are developers this means the ordinary user often has limited hopes of seeing a desired feature implemented.

While theoretically a great way to ensure user empowerment, an open source development model in itself therefore shares many of the problems of "traditional" top-down development models - most prominently having only a limit-

ed amount of people with "real" power over the software - and can thus not really be considered a true bottom-up approach. Though it could be argued that this is a moot point as the availability of multiple alternative social networks in itself has bottom-up characteristics, since people have a meaningful choice in what network they choose and where they establish their social graph, this would be at odds with the primary purpose of socialising SNSs ("recreational social communication"). After all, a fragmented ecosystem of social networks prevents people from actually connecting and communicating with each other, because social networks usually are not interoperable (Yeung et al 1).

In a similar vein, it is possible for people to "fork" an open source project - that is, create a separate project based on the openly available code – if they are not satisfied with the direction its development has taken, which would seem to alleviate some of the concerns having a small group of developers raises. However, this is hardly practical in the case of social networking, as it would again lead to fragmentation and separate networks which in turn inhibits creating social relations between the people on these separate networks (cf. Lerner & Tirole 212, 222). Therefore, especially in the case of open source social network platforms most meaningful decision making power in the end rests with whoever has been authorized to make changes to the code (cf. van Krogh et al. 1229). So in the end, even if a user has both programming skills and good ideas, he or she may in practice still be barred from directly contributing, creating a hierarchy within the project's management with the authorized developers having final say.

In spite of these characteristics that seem to be at odds with user empowerment, as mentioned before several smaller alternative social networks still have respectably-sized user bases that obviously appreciate the features these networks offer. Alternative networks can carve out a niche for themselves by offering certain combinations of features not offered by other networks: while

the "market" for this may be small, it can often be big enough to create a sustainable community, as is the case for Lorea. The power of such networks lies in specialization and offering features tailored for a specific group of users rather than catering to as many people as possible. In this way, they do empower the users: they allow them to express themselves in ways not possible on other networks; a simple example would be Diaspora's usage of a text-field rather than a multiple-choice selection for a user's "gender" setting (McNicol 202). In the end, however, users are still at the mercy of the developers even in such cases.

How to involve the user?

It seems that even these alternative networks are in some aspects still stuck in the ways of those other networks they attempt to offer an alternative to. In an ideal world, every single one of a network's users would be able to contribute to the network's software and add to it so that it suits their needs perfectly. This is unfortunately not the case for any network at this point, though not without reason: not only does working on the network's software require certain programming expertise, but one user's wishes may not always align with other users' wishes, and to prevent the social network ecosystem from becoming too fragmented it is necessary to only allow the implementation of new features that benefit a majority of the users; for example, on the basis of consensus. This paradigm, common to open source development, attempts to find a balance between an individual user's interests and the interests of the user base as a whole.

This is, though, a compromise, and the question remains whether in the case of (alternative) social networks another approach with a result closer to the ideal would be feasible. After all it seems curious that, even in a context where a bottom-up approach and user empowerment are often considered core values, most development decisions are in the end still made by a relatively small

group of developers that do not always have an incentive to give the end users' most pressing bug reports or feature requests priority. It would seem desirable to empower users in a more effective way, so that the bottom-up approach in turn becomes more prevalent.

There are several issues with the way most contemporary alternative social networks are set up that prevent such empowerment. One of the issues with giving users increased influence over software is the technological learning curve; software development naturally requires a familiarity with certain programming languages and paradigms that is out of grasp for a lot of people. While this may be less of a factor in certain communities - many technology portals offer their users an option to change the site's layout using the CSS mark-up language, for example - there are still other related issues that would prevent users from contributing in a meaningful way.

To some extent this arrangement is borne out of necessity: having no restrictions on who can contribute and make changes to a social network's software is a recipe for disaster, as people can easily sabotage the network or expose user data this way - which is exactly what many alternative social networks are trying to prevent. While direct access to the code may be limited, many open source social networking projects still have facilities in place that allow users to contribute ideas and feature requests in an organized and meaningful way. For example, Elgg, the popular general-purpose social networking software package from which Lorea was forked, has a public "bug tracker" in which people can submit problems with the software, which can then be commented on by other users and adopted by developers. Other platforms, including Diaspora and Crabgrass[8], offer a similar system.

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8   https://we.riseup.net/

Some projects adopt a less formal approach. Lorea, for example, primarily collects user feedback through a user group on the social network itself, which it calls the "Permanent Assembly" on the N-1 network pod[9], after the anarchist practice of achieving consensus through a meeting where every single member of the group is consulted. Similarly, it holds monthly "virtual assemblies" in which everyone is invited to share ideas and suggestions. While this obviously tries to invoke the spirit of egalitarianism in the end the power structure is still the same: a small group of developers has the final say in what contributions get accepted and which feature requests are implemented to the main software platform.

Towards an alternative

It could be concluded that to achieve true user empowerment, one not only needs alternative social networks but also alternative development models for these networks. With the current approach, there is a somewhat higher degree of "openness" with regards to software development but ultimately the same power structure that is often criticized in mainstream networks repeats itself. From a user empowerment point of view, this is limiting and may even inhibit innovation, as users may have solid ideas that are not implemented due to them having direct influence on the software development process.

The big problem with any development model that puts more immediate power in the hands of the ordinary user is that it could lead to fragmentation and disruption of the social network. Common features of social networks that follow the "Facebook model", such as friend lists, time lines and group pages rely on every user using the same software to make sure data is consistent across the user base. Hence, an alternative development model in turn would require the software developed through this model to be radically different as

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9   https://n-1.cc/g/lorea/

well: giving users more power unavoidably means that it is no longer possible to rely on everyone having exactly the same experience. It would be necessary to maintain some level of interoperability, as otherwise the network is no longer a network, but as users adopt different software configuration the social network would unavoidably become more insular. A move towards a true bottom-up, user-empowering development model will always be a trade-off to some extent.

An alternative model for alternative social networks: IRC

To study the effects of an alternative software design or development model on social network sites it would be useful to take a closer look at existing software that employs an alternative design. A perhaps somewhat unexpected case that would be interesting to analyse in this regard is IRC, or Internet Relay Chat. While in itself a simple protocol that enables basic client-to-server messaging and not much else, IRC users have taken it upon themselves to develop all manners of tools for extending this functionality, resulting in a varied collection of software that allows users to customize their IRC "experience" to their liking. As IRC activity is typically clustered around "channels" (analogous to chat rooms), this makes for an ecosystem where one can easily join multiple channels that often offer a specific set of features. Likewise, clients (used to interact with the IRC network from the user's end) are usually highly customizable and many different clients are available to users.

IRC as a social network service

IRC does not fit neatly in the definition of (alternative) social networks found earlier – as it is aimed at facilitating chat rather than social network sites, it for example does not allow for user profiles and only shows a social graph in the sense that all channels offer a list of people that are in that channel at a given time. "Friending" and posting on someone's "wall", staples of social network
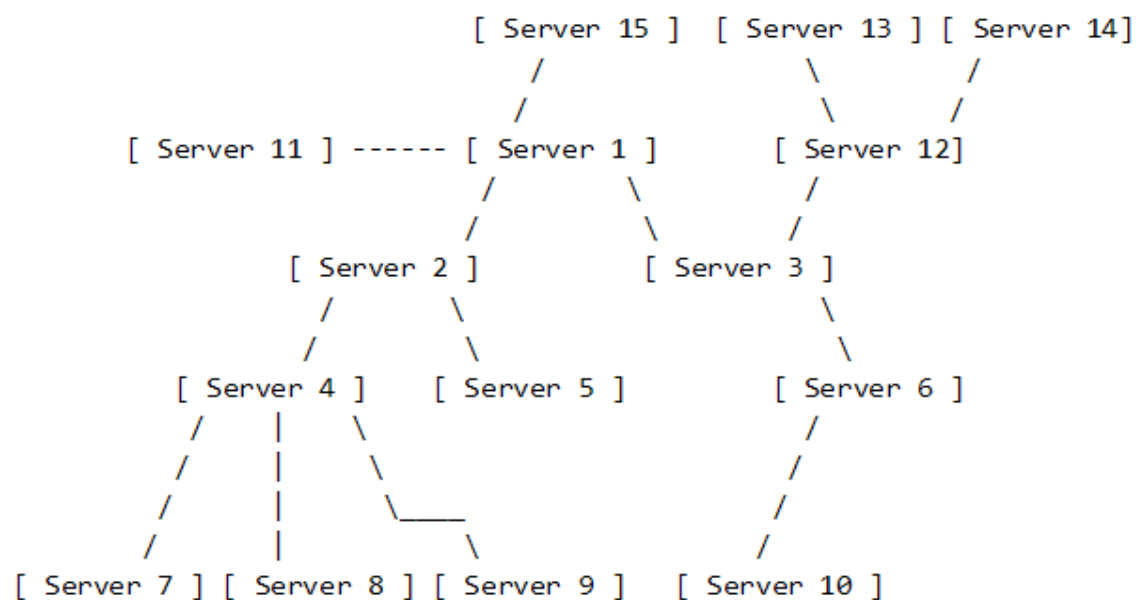
sites, are not part of IRC. Nonetheless, it is an inherently social phenomenon. The very purpose of the protocol is to enable communication between people; moreover, while many chat protocols and networks are tailored to one-on-one communication, IRC's primary purpose is to enable "conference chat", with multiple people within one channel. A typical IRC client shows a list of people in the same channel as the user on screen, and messages are often explicitly aimed at specific people by prefixing them with someone's nickname. The emphasis is on group chat rather than one-on-one communication; many IRC channels – which anyone can join, by default – form close-knit communities with people that have kept in touch via IRC for years. The emphasis on group interaction makes IRC an interesting analogue to contemporary social networks or socializing SNSs that have a similar focus, though a different means of addressing that focus.

The IRC protocol was conceived in 1988 by Finnish programmer Jarkko Oikarinen as a way to "send messages to people on other machines". Based on existing protocols MUT (Multi-User Talk) and BITNET Relay Chat, Oikarinen came up with a relatively simple protocol that allowed computers to form a network over which messages could be sent, facilitated by a central server that made sure the messages reached the correct destination. Initially mostly popular with Finnish university staff and students, IRC quickly spread to other countries and networks until at its peak in 2004/2005 the "Big Five" networks all had between 100.000 and 200.000 concurrent users (Stenberg). While usage has steadily declined since then, statistics site *irc.netsplit.de* still reported a user peak of over 500.000 users total in the first week of April 2013.

It must be emphasized that IRC is a protocol, not a piece of software like Elgg or GNU Social. It describes a way for servers and clients to communicate in a mutually understandable way, but it is in the end up to others to implement this protocol in their software; developers are in turn completely free in how

they design this software, as long as it adheres to the protocol (if not, it won't be able to communicate with other client and server software). Likewise, an IRC network can be set up by anyone and can be any size; the only "requirement" is that it uses the IRC protocol for communication between servers and clients. The software these servers and clients run can take many forms; they only have to speak the same "language", the protocol defined by the IRC standard. This allows them to exchange and synchronize information and form a network.

IRC networks are neither decentralized/federated nor truly centralized. An IRC network exists out of several servers connected through a structure resembling a tree: while there is one central node to which all other are in the end connected, other nodes are usually not directly connected to this central server, only through "sub-servers". As Oikarinen illustrated in RFC 1459 [10], the latest version of the IRC protocol specification:

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                          [ Server 15 ]   [ Server 13 ] [ Server 14]
                              /                  \              /
                             /                    \            /
      [ Server 11 ] ------ [ Server 1 ]           [ Server 12]
                            /        \              /
                           /          \            /
             [ Server 2 ]              [ Server 3 ]
              /      \                         \
             /        \                         \
      [ Server 4 ]     [ Server 5 ]          [ Server 6 ]
       /    |    \                              /
      /     |     \                            /
     /      |      \___                       /
    /       |          \                     /
[ Server 7 ] [ Server 8 ] [ Server 9 ]   [ Server 10 ]
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10   The RFC (Request For Comments) is a traditional format for publishing internet-related standards.

Such a network of servers forms one IRC network; typically all servers within one network must run the same kind of server software. Traditionally there have always been about five big networks with 100.000 or more users and a myriad of smaller networks (Stenberg), with especially the bigger networks often running their own brand of server software. Likewise, while all IRC clients (generally) implement and use the IRC protocol, there are many different kinds of client software. While originally most servers used the ircd (IRC daemon [11]) software initially developed by Oikarinen, many larger networks eventually started developing their own server software that added new features that suited their specific needs while still adhering to the IRC standard (ibid.). The client software followed a similar pattern; while initially people used the original client (simply called irc), soon new client software was developed by others, which was made easy by the relative simplicity of the IRC protocol. These clients offered features such as an address book of contacts or ways to save one's chat history that were not dealt with by the IRC protocol itself. A large number of clients, servers and other tools using IRC is available; free software catalogue FreeCode lists over 500 projects labelled "IRC" [12].

The IRC software ecosystem and user empowerment

This variety is exemplary of the IRC "ecosystem" as a whole. There is a strong tradition of using user-developed tools on top of the "bare bones" IRC protocol in order to create an IRC experience tailored to individual needs and desires. For example, IRC, as a chat protocol, provides no means by itself to store and recall messages; users have made "chat loggers" (IRC clients with the sole purpose of recording whatever is said in a channel) in response, and programs that process these chat logs to generate chat statistics (such as who has been the most active user in a channel, or which users interact with each other most

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11   A daemon is a computer program that runs in the background, rather than being directly user-controlled.

12   http://freecode.com/search?q=irc

often). While primarily used for entertainment, such statistics generators have also been used for research purposes; for example, Rintel and Pittam used a thorough analysis of IRC chat logs to investigate the kind of relationships that could be formed through computer-mediated communication (507).

From a user empowerment perspective, the user-driven IRC software ecosystem presents an interesting situation. There is no central authority or group of people that has any say over the features afforded by IRC (the IRC standard itself was last updated in 1993), and instead a wide variety of user-driven initiatives to build features on top of IRC has sprung up. While this makes for a somewhat fragmented software ecosystem, it also makes it possible for users to customize their experience to a great extent. Compared to open source social network software such as Elgg, IRC is a lot easier to develop for, due to the simplicity of the IRC protocol, allowing users to develop IRC-compatible software even when they have little programming experience. Programming an "IRC bot" (a chat robot that connects to an IRC network) is a common beginners' programming exercise. Furthermore, because IRC is a protocol rather than an existing piece of software, the user has free choice of programming language and paradigm when writing his own IRC tools and features.

As IRC activity is typically clustered around channels, which can be any size but – going by irc.netsplit.de's statistics – on average have 10 or fewer users in them, this means that IRC users will typically experience IRC in a significantly less uniform way than people experience services like Facebook Chat or Skype. These other services cannot be customized by the user and offer no meaningful choice of what client to use; while initiatives such as Facebook Resistance offer ways to customize user experience on such closed, these customizations are typically superficial compared to what's possible on IRC due to Facebook's iron grip on its software platform.

Customization goes further than merely recording what's said or mapping the social graph for entertainment purposes. An example is CloakNet, a piece of software that allows people to communicate in a cryptographically secure way[13] – IRC in principle sends messages in plain text, which makes it easy to read communications for any eavesdropper. CloakNet acts as an intermediary between the IRC client and the IRC server that encrypts messages before they are sent to the server, and likewise decrypts them before they reach the client; all without intervention from either the user or the server. The result is a secure method of communication – eavesdroppers would only see gibberish – that still utilizes the existing protocol and network infrastructure of IRC.

CloakNet is far from the only example of such an extension of basic IRC functionality. The aforementioned free software site FreeCode offers software projects ranging from programs that allow you to play chess via IRC to applications that map the social structure of an IRC network visually. Privacy-related tools are commonplace as well; apart from CloakNet there are projects such as IIS, which obfuscates IRC traffic by mixing it with fake messages that get filtered out on the receiving end, or DiRT, which allows people to choose their own encryption algorithms for their communication [14].

It could be argued that such "bolted on" features are mainly patchwork for IRC's deficiencies; the protocol was originally designed as just a way to send simple messages to each other, and the unexpected popularity exposed its lack of other features. Its reliance on users to provide these features could then be seen as an annoyance; a better protocol would've provided for more than just bare-bones functionality. If the IRC protocol supported encrypted communication, an ad-hoc service like CloakNet or IIS wouldn't be needed. On the other

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13   http://www.s1m0n3.org/cloaknet/about.html

14   http://dirtirc.sourceforge.net/

hand, it might be precisely the lack of features that makes for IRC's sustained popularity. As IRC doesn't impose a specific way of encryption on its users, they have had to come up with their own solutions; this way, users have a wide choice of how to secure their communication even if they do not have the knowledge to implement the algorithms by themselves. Arguably, this is a true bottom-up approach: encryption for IRC didn't originate with one developer or group of developers, but was implemented in several different ways just because people felt like their approach was the best.

The IRC paradigm in an SNS context: FOAF

What would such an approach look like within the context of (alternative) social media? IRC's bottom-up software development model can mostly be contributed to two factors: the simplicity of the IRC protocol, and the fact that it is a protocol rather than software. There are initiatives and projects that do seem to apply this simple, bottom-up, protocol-based approach to social networks. The most prominent of these is probably FOAF (Friend Of A Friend), a W3C-backed standard for exchanging social information such as personal data and relationships with other people. This is a data format rather than a protocol, but the pattern is similar – FOAF describes a way for applications to exchange social data in a mutually intelligible way. FOAF is based on RDF, a general-purpose data format, which in turn is represented as XML, a data format that is widely used and legible to both humans and computers. Writing an application that can read XML (and by extension FOAF) is relatively easy and several small tools that allow people to generate a FOAF file based on their own data or their social network accounts have been released. The FOAF project's intent is to allow people to host their own personal data, which then forms a sort of distributed social network with others sharing the same kind of information.

The FOAF approach at first glance seems to be very similar to the IRC approach in some key aspects: a simple, easy-to-implement base standard, a variety of applications using this data format and a clear social component. Furthermore, FOAF has the added advantage of really putting the user in control;

it is suggested that users host their own FOAF data, which is obviously a great boon with regards to user empowerment, as this gives them full control over the access to their information. Yet, while FOAF has seen some adoption, by and large no significant players are using it [15]. Even alternative social networks such as Lorea and Diaspora do not employ FOAF in a significant way, though they do provide tools for exporting user data in the format (Tramp et al. 212). So while usage of FOAF offers many of the conditions that make IRC an attractive platform from a user-empowerment perspective, this does not seem to hold much of an appeal to users or developers at this point.

So why have social networks not taken up the bottom-up, user-empowering paradigm even though the technology is there? It could be argued that IRC has only a small user base as well, indicating there simply is no desire for such a thing in general. However, the small but sustained popularity of both IRC and alternative social networks with user empowerment as a core value makes clear that this is not the case. Perhaps a factor is that the FOAF approach makes for a social network that is too decentralized. While on IRC there is always a server-client hierarchy, with clients connecting to one of a limited set of servers that constitute the backbone of the network, when using FOAF in principle the user is also the server. This means there is no central place to discover new users, retrieve their information, et cetera; which, in turn, means that there is no single social network, just a large set of potential members of networks – a disadvantage when the major function of the social network is "recreational social communication". Availability of personal information does not constitute a network, even if this information is presented in a standardized way: another requirement is a solid and fast infrastructure (Narayanan et al. 3). IRC by nature defines how the server-client hierarchy and communication works,

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15   While Facebook uses an RDF-like data format for its "Like" feature, their implementation has little to do with the way FOAF was intended to be used by its authors (Hui & Halpin 109).

while FOAF doesn't do anything of that sort, instead relying on users to host their own data and leaving it at that.

There are initiatives that expand on FOAF and also address the network side of the coin, such as FOAF+SSL, which adds the secure networking SSL technology offers to FOAF's personal data standard. However, at the core the distributed network architecture FOAF pushes for has inherent problems with regards to social network applications. Vincent Toubiana has pointed out that the lack of a centralized regulating authority – such as a server through which all traffic passes – also means that it becomes harder, if not impossible, to ensure that all actors within a network respect your wishes with regards to how your data is shared: "in a federated system, your privacy is not subject to the nudges implemented by your system but by the system that your friends use" (Barocas et al. 355). FOAF does not prescribe a specific way of setting up a network based on it, which gives any implementers a high degree of freedom in deciding how to handle FOAF data. This means that from a software perspective settings such as "show only to friends", like Facebook offers, are practically meaningless: there is no way of making sure that a friend's specific FOAF-compliant client will respect this setting; it might even offer an option to view personal details of all connections that user has. There seems to be a trade-off between "centralizedness" and the effective control that can be exerted by users over their data. From a user empowerment perspective, it is on the one hand beneficial for users to be in charge of hosting their own data, but within a whole network of people being in charge this means ultimately no one is in charge of maintaining adherence to privacy guidelines and interoperability (Narayanan et al).

IRC avoids this problem by employing a more or less centralized network architecture. The only place to get user data and other information is a server, and as these servers synchronize with each other constantly and employ the

same software throughout the network, they can consistently enforce a specific way of communicating and sharing information. As soon as this synchronization goes awry, a "netsplit" occurs – a "branch" from the tree network separates from the rest, and cannot reconnect until the servers have synchronized their data again. Synchronizing between servers is doable, but synchronization between all clients – which would be required for a distributed network to preserve data integrity – is time-consuming and not as reliable (Narayanan et al.). A centralized or semi-centralized architecture has some clear advantages, from a social network perspective.

To recap, an IRC-like approach to social networks could be beneficial from a user-empowerment point of view, as it makes for a software ecosystem in which users can easily write their own software for the platform. Additionally, if that is not possible, they can choose from a wide variety of available software while still maintaining compatibility with other users. While such an approach to social networks exists in the form of FOAF, there are a few issues with the implied distributed nature of this data format that present challenges for the feasibility of a platform based on that standard. Notably, a major difference between IRC as a software platform and a platform based on FOAF is that IRC presupposes a (semi-)centralized network structure, while FOAF is in principle a format to be used in a distributed fashion. Meanwhile, research suggests that distributed networks have some inherent disadvantages with regards to social networks. Therefore, the current implementation of an IRC-like bottom-up approach to social network software development, with FOAF as a leading example, could be described as having the right spirit but lacking in practical applicability.

Discussion

Alternative social media distinguish themselves from "mainstream" social media in several aspects. Most of these can be grouped under the label "user empowerment"; in general, alternative social networks attempt to put the power to manage their personal data and customize their experience in the users' own hands. This core value is apparent in, prominently, the development model most alternative social networks use for their software platform: usually an open source model is used where people, in theory, are free to contribute and comment on the software by themselves, which fosters transparency and involves the users in shaping the social network service.

In practice, however, it is still a relatively limited group of people that has "executive power" in an open source project. Given this, and the monolithic nature of both mainstream and alternative social networks – one main software platform is used by the whole network – even an apparently transparent and open development model like the one services such as Diaspora or Lorea employ is an impediment to user empowerment.

An alternative model that would be more empowering to users can be found in the IRC software ecosystem, where the lack of a central entity with influence over software development fostered a software ecosystem where there is a wide variety of both client and server software and clients can often be customized and extended by users to a great extent. This is made possible not only by the lack of central development oversight but also by the simplicity of the IRC protocol, which lowers the bar for users to develop their own tools and tweaks. Even if a user is not a proficient programmer, there is a wide choice

of small tools made by others that can be combined to create the desired user experience.

There is no completely analogous approach within the (alternative) social networking context. The FOAF data format has a lot of aspects in common with the IRC protocol – easy to understand, allows users to create their own tools and software to work with it – and should theoretically allow for a similar sustainable software ecosystem. However, it has not been adopted widely as a central social network technology. This may be the result of one crucial difference. The network structure promoted by the FOAF data format, that of a distributed network, has several deficiencies when it comes to social networks; most importantly, the lack of a central server or place to acquire user information and connect to for updates and communication purposes, and the reliance on users to host their own data. Because of these fundamental issues, many features often central to socialising in social networks cannot be implemented as successfully as in a social network that uses a centralized server.

The "IRC model" has proven itself as allowing for a sustainable, highly customizable software ecosystem where users enjoy great freedom with regards to shaping user experience and data protection. This has advantages over the "traditional" open source development model employed by many alternative social network services. FOAF is an attempt to bring an IRC-like paradigm to social network sites, but this is impeded by its reliance on a distributed network architecture.

An obvious solution would combine the advantages of both technologies. This could take the shape of a central server that can be contacted with requests for user data, which then retrieves the data either directly from the user – which would still retain some of the disadvantages of a distributed architecture, like data becoming outdated as a user's server goes offline – or from the server

itself, which in turn would retrieve the data from the user at periodic intervals or allow the user to update the data on the server itself. The latter solution is more similar to the current model of many mainstream social networks and could be unacceptable for those who want to retain a high degree of control of their personal information. The main difference would be that while social networks currently use proprietary, non-standardized data formats which discourage users from developing their own client or server software. By using a standardized data format or protocol – like IRC, in the case of chat communication – this disadvantage could be mitigated. This would also allow users to easily set up their own network with the data and software used on another network that no longer suits their needs. This is something that is typically not possible at this moment, as for example Lorea and Diaspora use freely-available software but employ different ways of storing user data – setting up a Lorea pod based on existing Diaspora user data is not trivial. Like on IRC, this ability would allow users to easily set up "splinter" networks in case of disagreement with the existing network.

All in all, the main lesson to take away from IRC is that following a standardized protocol (or data format) allows for great user empowerment and a varied, bottom-up driven software ecosystem. It lowers the barrier to developing software tools for less-skilled developers, and therefore makes for a rich software ecosystem. This lesson has been learned to some extent in the social network context in the development of data formats like FOAF, though network structure remains an issue. While distributed networks allow great user control over data, it also has nontrivial disadvantages with regards to actual socialising on the network. Therefore, a hybrid solution may be the way to go forward. At any rate, a truly user-empowering social network solution is still on the horizon.

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