The Role of Online Social Networks in Political Uprisings

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Abstract

This paper gives an overview of what online social networks are, what they are used for and how communication via such networks works. The focus lies on Facebook and Twitter since those two played a major role in big political events around the world in the past 3 years. Five of those events are described in more detail and analyzed in relation to the use of social media. A low degree of separation and small world phenomenon seem to help people in organizing, coordinating and spreading news about social happenings efficiently. But also the negative side-effect of online social networks like being some kind of walled gardens as well as censorship-issues are discussed.

1. Introduction

Online social networks seem to be more than just another online trend. Hundreds of millions of people use them every day. But Facebook & co. can be used for more than sharing photos of the last party or posting “happy birthday” on some friends’ virtual wall. In fact they are utilized as tools for coordination and communication in severe situations.

Because of recent happenings in early 2011 (“Arab Spring”) this topic is very up to date and so is this paper. It deals with these very new phenomena as well as with events, like the 2009 Iran post-election-crisis, which are already studied quite well.

This paper does not present any new findings or results on the usage of online social networks. Instead it gives an overview of usage scenarios of such networks with a special focus on distributed organized movements. However, it may provide some new insights as it connects and compares previous work done by multiple researchers.

The rest of this paper proceeds as follows. Section 2 presents some basics about social media and online social networks in particular. Those networks are described regarding types of communication they provide, uses they have and other interesting characteristics. Twitter and Facebook are furthermore discussed in more detail. In Section 3, I describe five selected cases where social media was used extensively: “April 6 Youth Movement” in Egypt 2008, post-election crisis in Iran 2009, student protests in Austria 2009 as well as recent uprisings in Tunisia and Egypt 2011. Section 4 provides information on internet censorship and how it is battled by affected people. Last but not least, Section 5 shows how social media can be used to increase transparency and support anti-corruption measures. Section 6 concludes.

2. Social Media

Social media is a relatively new phenomenon on the internet and a vital part of Web 2.0. It includes all kinds of websites, applications and technologies that can be used to produce, publish and share media in its widest sense. The main focus lies on collaboration and communication of users.

There are several examples of popular social media services. Table 1 lists some of them.

Online social networks	Facebook, MySpace, LinkedIn, Xing, Orkut
Microblogging services	Twitter, Jaiku, Tumblr
Video sharing services	YouTube, Vimeo
Image sharing services	Flickr, Picasa

Table 1: some examples of popular social media services

Online social media services are among the most popular sites on the World Wide Web. According to alexa.com traffic statistics[1], 3 out of the top 5 sites belong to this category.
The number of registered users, which can be seen as another metric for popularity, grew massively in the last months. For example, Facebook is said to have around 640 million users as of May 2011[2].

2.1. Online Social Networks

Online social networks (OSN), also called social network sites (SNS), typically provide the following features:

- let users present themselves via personal profiles that can be seen by others in more or less detail
- provide multiple ways for users to communicate with each other
- let users host content such as photos or videos
- let users connect to each other in some kind of way
- let users explore the network, relations and shared content [11, 31]

Relations between users are the most vital part of every OSN since they define the social network [11]. Illustrated as a graph, users are nodes and relations are edges connecting them. Some OSN provide public interfaces and thus can be extended with third party applications.

2.2. Classification of OSN: Type of communication

Communication is not structured the same way in all social media services [7]. Hintikka distinguishes between status stream communication and thread-based communication. Both enable for different kinds of collective actions and feelings of collectiveness.
Status streams are a form of one-way mass communication that can be used to broadcast messages in a simple and fast way. Messages can spread very quickly in a network which

[1] http://www.alexa.com/topsites
[2] http://en.wikipedia.org/wiki/List_of_social_networking_websites

is loosely coupled (there is no strong sense of community) and many people can be addressed without big effort.

On the other hand, some kind of backchannel is needed in order to bundle communication and increase awareness to be able to manage more complex tasks. Channels and threads provide that kind of framework and support coordinative and iterative tasks. The sense of community is often stronger than with status stream communication.

Although Twitter provides directed messages (tweets starting with „@username“) and thus some basic kind of backchannel, this cannot be seen as fully thread-based communication.

Facebook cannot be easily categorized as one or the other because it's a mix-up that provides both mass status streams (wall-posts, event-invitations, group-invitations) and backchannels (forums on groups and fan-pages, private/group messaging).

[7] presents in addition to well-known OSNs Facebook and Twitter two other networking sites that seem to be popular in Finland: Jaiku[3] / Quaiku[4] and Ning[5]. The author describes them as more suitable for supporting iterative and complex problems while Twitter and Facebook can be used for simple, repetitive collective actions.

2.3. Uses of OSN

Probably the most important feature of OSNs is that they provide very cheap and very fast means of communication both in one-to-one and one-to-many manner [1].
Individuals, companies and state officials can spread information easily and reach a broad audience. But also very specific communication targeting single persons or small groups is easily possible.
What really distinguishes OSNs from traditional mass media is the existing backchannel which makes it possible for everyone to react to information received.

2.3.1. Company-intern (Intranet)

In [9], Cohen et al. studied the possibilities of using OSN for company internal knowledge management and strengthening of collaboration between employees [9].
For that purpose they developed a new online social networking application called “Peers”. Like in every other OSN users in Peers are able to create personal profile pages with a photo, contact information, etc. In addition to that, every profile page lists the users’ expertise areas and project information. Therefore it becomes kind of a compendium of the employee’s activity at the organization. This can, of course, be very useful for colleges.
The authors argue that profile pages maintained by employees are more likely to be up-to-date and relevant than company-maintained ones.
Their application also provides so called shared workspaces that are set up for specific topics. Each workspace has a separate blog, a document repository and a directory of the Peers members that are participating in that space.

Cohen et al. conclude that online social networks suit perfectly to the needs of companies wanting to enhance cooperation, collaboration and the sharing of knowledge between employees.

[3] http://www.jaiku.com/
[4] http:// www.qaiku.com/
[5] http://www.ning.com/

2.3.2. Organization of offline gatherings

In [6] the authors focused exclusively on online social networks' use for offline face-to-face contacts [6]. They studied how students organize their social lives with the help of Facebook.

Barkhuus et al. distinguish four types of social gatherings that are planned in different ways:

- Scheduled social gathering: this mainly includes events and meetings that are partly social but have a practical purpose too (e.g. planning other events). Scheduled social gatherings often are recurring events and are planned with the help of Facebooks "event"-function (event is set up by one user that sends invitations to others).
- Semi-scheduled social gathering: regular recurring social meetings like lunch dates. They are most of the time planned face-to-face or via mobile phone. Facebooks "event"-function seems not to be practicable for such kind of gatherings.
- Ad-hoc social gathering: this includes all kinds of gatherings that are either not or short-time planned. Facebook status messages were found to facilitate these types of meetings in particular.
- Special events: bigger and irregular events fall under this category. Again Facebooks "event"-function is widely used. Facebook status messages (wall posts) are being used for reminders.

The authors found semi-scheduled and ad-hoc gatherings to be most common for students. Therefore Facebooks "event"-function seems not to play a big role in students' organization of their day to day lives.

2.4. Small world phenomenon & degree of separation

Multiple studies have shown that the small world phenomenon exists in online social networks, i.e. there exists a relatively short path between any two nodes in the network graph [1]. But not only OSNs have that phenomenon. The network of related videos on YouTube, for example, shows the same characteristic.

Pakzad et al. also found that OSNs having small world phenomenon also show a good proportion of in-degree and out-degree of nodes in their graph.
Therefore the average path length in those OSN is much shorter than in the World Wide Web, where web pages with many out-links (high out-degree) not necessarily have many backlinks (high in-degree) too. Furthermore, the clustering coefficient of those OSNs is much higher than that of the World Wide Web. The fact that most relations in OSNs are reciprocal and web-links are not may be an explanation for that.

Kwak et al. present detailed research on small world phenomenon and degree of separation in microblogging service Twitter. Since relations between Twitter users are not reciprocal, they expected the network to have a degree of separation greater than 6, which was postulated by Stanley Milgram to be applicable to the real world in his „six degrees of separation"-experiment [25]. Other than expected the authors found the median path length being 4 and the average path length being 4.12. For 70.5% of the user pairs, the path length even is 4 or shorter. [10]

These very short communication paths and great clustering coefficient can of course have a positive impact on organizing big events and movements where it is crucial to reach a great amount of people.

2.5. Walled Gardens

As online social networks gain more and more popularity and host more and more content (messages, status updates, photos, videos, etc.), one question arises: What happens when Facebook & co. go offline?

In literature Facebook is called a „walled garden" because all the things that users do and all content they create is locked on the site. [8] Facebook replicates some traditional applications like email, instant messaging and blogging and thus is becoming kind of an internet inside the internet. It does not provide any API or export functionality to extract/download all of users' photo albums for example. All conversations held with other people via Facebook chat, messaging or status updates could not be exported in case of Facebook shutting down its servers.

Facebooks closed infrastructure also is the reason why researchers focused on the use of Twitter in emergency situations, uprisings etc. (e.g. [16], [20], [21], [23]). It's just not possible to analyze Facebook data in a comprehensive way.

Social media being that closed is not only problematic for personal use but also for academic research. A blog post ([26]) linked on the webpage of [10] reports on how changes made to Twitters terms of service in early 2011 may hurt academic research. With these changes, Twitter is no longer granting whitelisting requests (whitelisting was crucial for crawling Twitters dataset) and redistribution of content is no longer allowed.

„That's the news that 140kit just had to break to its users. 140kit is an extension of the Web Ecology Project, a project that grew out of work at the Berkman Center for Internet and Society at Harvard Law School and one of the very first research efforts into the cultural and political influence as expressed via Twitter. The group's research into Twitter's role in the 2009 elections in Iran was, in fact, one of the very first looks into how Twitter may both shape and reflect social and political upheaval. 140kit offered its Twitter datasets to other scholars for their own research. By no means a full or complete scraping of Twitter data, this information that the project had collected was still made available for download (for free) to researchers. But no longer.
As part of the new Twitter terms of service, 140kit like other organizations can no longer offer exports of Twitter data for any purposes - whether that's for profit or non-profit, whether that's for developers or scholars". [26]

However, people at 140kit[6] came up with a new idea recently: As they can't provide access to their raw data anymore, they invite researchers to pass their analytics on to 140kit where they are applied to the raw dataset [27]. The result is then returned to the researcher. „The goal here, then, is not to provide a service that exports data, but provide a service that allows researchers to ask any questions of their datasets via a library of analytics [...]".

[6] http://www.140kit.com

2.6. Facebook

Facebook started as an OSN for US American students and was restricted to users with .edu email-addresses [11]. Since this limitation was removed, Facebook can be used by everybody being 13 years or older. This led to a massive growth of its userbase.

Relations between users are called „friendship" and are reciprocal, i.e. both users must agree on being connected to each other.
Users can join so called "networks" which often represent offline groups defined by geographic region (e.g. a country or city) or shared domain (e.g. a university or company). These networks also define relations between users but they are not as strong and important as "friendships", i.e. "networks" in Facebook terminology are sub-networks of the whole social graph.

There are multiple ways to communicate with other Facebook users via the site. Table 2 lists and categorizes some of them.

	Public	Group	Private
verbally	Wall, group-wall	group-messages	private messages, chat
non-verbally			poking

Table 2: ways to communicate on Facebook

Please note that in this case, the meaning of "public" depends on the privacy settings of both communicating users and the group(s) they're in.

2.6.1. Uses of Facebook

"Keeping in touch" with others is by far the most common use of Facebook according to [11]. Joinson also found building social capital, communication, social searching and social browsing among others to be common uses of Facebook. The term "social searching" refers to finding offline contacts and information about them online. "Social browsing" refers to the use of an OSN in order to find new people that may be contacted offline too in the future.

2.7. Twitter

Twitter is the worlds most popular microblogging service. Its users can post short messages (140 characters maximum) called "tweets". In [7] Twitter is called a "personal mass media".

Tweets can be either directed or undirected [13]. Direct messages are prefixed with "@username" and are used to communication directly with another user. Undirected posts do not target any specific user and are meant for anyone caring to read it. Anyways, both types of tweets are never private and therefore all tweets can be seen by everybody.

In Twitter, relationships between users are not reciprocal, i.e. user A following user B does not require B to follow A [10]. In fact the level of reciprocity in Twitter is lower than in other social networking services (e.g. Flickr). Kwak et al. found around 22% of user pairs being reciprocal and thus describe Twitter as „ more [as] an information spreading medium than an online social networking service".

Huberman et al. investigated on Twitter being used as medium for direct communication between users [13]. They defined Twitter user B being “friend” of A as soon as A directed at least two posts to B (i.e. Tweets starting with „@B“) and found out that the number of friends a user has is very small compared to the number of people she follows. Thereby Twitter seems not to be used as a friends-network (such as Facebook, for example) which confirms the findings of [10]. In [13] a kind of opposite statement is made where it is stated that around 25% of all tweets are directed.

2.7.1. Locality

Twitter lets its users specify the time zone they're located in. Looking at this information it can be seen that for a great majority of users the time difference between them and their followings/followees is three hours or less [10]. This indicates that most networks are geographically local which can be useful in spreading information on local events (e.g. natural disaster in one country or region).

2.7.2. Content Categorization

Due to the vast number of tweets and thereby information that is produced on Twitter, it is necessary to have some kind of content labelling/tagging in order to be able to search thru that information. Twitter users utilize so called hashtags (words prefixed with a “#” character) to mark the topic a tweet belongs to [10]. The most used hashtags define a list of “trending topics” which is maintained by Twitter.

2.7.3. News Spreading

In recent events that affected a lot of people, e.g. earthquakes in Japan followed by a tsunami and incidents in Fukushima nuclear power plant, Twitter was used by those people to spread live news about the event. By nature these tweets mostly are ahead of reports by traditional media thus Twitter plays an important role as media for breaking news [10].

Kwak et al. did some research on how news spread on Twitter via tweets and retweets [10]. They found that the concept of retweeting enables every user to reach a broad audience. That is because once a tweet gets retweeted, a certain number of users will be reached no matter how many followers the tweets originator has. This schema changes as soon as the originator of the first tweet has more than 1000 followers. Once retweeted, it is very likely for a tweet to get retweeted even further up to four hops away from the original source and thus gaining audience at every hop.

Information spreads fast on Twitter: nearly all retweets happen in under a day, half of them even within one hour [10].

Twitter can be used with a large variety of clients including such for mobile devices. Tweets can also be posted by sending e-mails or SMS text-messages. These interfaces support users in propagating live-news directly from the scene of action [22].

What else is interesting is that there seems to be a relation between the number of followers and the number of tweets by a user. Mendoza et al. observed that the number of tweets posted by users with more than 2000 followers is one order of magnitude higher than of those with fewer followers [21].

2.7.4. Information Integrity

Since everybody can post on Twitter it is very important to separate true information from false rumors. The filtering that is done by journalists in traditional media is not available here so people have to question and filter tweets on their own.

Regarding the protests after 2009 Iranian presidential elections, many in-depth talks were held on the BBC and CNN discussing „What is the verification of footage", „What should be picked by official media" and „to what extent the collaboration of official media with absolute grassroots is achievable given ethical journalism" [15]. Yet the discussion goes on.

The problem of information integrity on Twitter was the main research focus in [20], [21] and [22]. They all studied the behavior of Twitter users in and after extreme situations such as emergencies and natural disasters. This helps assessing the reliability of Twitter as an information source under extreme circumstances [21].

Mendoza et al. analyzed what was going on after the 2010 earthquake in Chile and how information propagated on Twitter [21]. They gathered tweets and labelled them as "true news" or "false rumor" by hand. Afterwards they analyzed how those labelled tweets propagated via retweets. Their results show that the retweeting behaviour of rumors differs to that of true news. Users tend to question rumors more than news. This may indicate that there exists some kind of collaborative filtering. Mendoza et al. suggest that it could be possible to use that behavior to automatically warn people using microblogging sites whether there exist many messages containing questions on a specific topic.

In [22] it is stated that tweets originated by trusted sources such as traditional news media or governmental agencies are judged to be valuable and therefore retweeted quite often.

3. OSN Usage in Political Uprisings

Shirazi wrote in 2008 that „Over time, it will become apparent that the sheer volume of information available to people in the Middle East, especially eagerly consumed by young people, will transform politics and the outcome will be a new wave of democratization, as authoritarian regimes find it difficult to survive." [20, p. 18] This statement is actually true, looking at the events described in this section.

Due to the great up-to-dateness of some events mentioned here (uprisings in Tunisia and Egypt in 2011), it is not possible to present related academic research. Therefore, for those events I give an overview of what happened and how the use social media was reported by journalists and participating people. For other events, like the 2009 post-election crisis in Iran, that have been widely analyzed and studied, those related studies are presented and discussed.

3.1. April 6 Movement Egypt 2008

Back in 2008, Egypt was ruled by long-time leader Hosni Mubarak. The nation was under emergency law, making it legal for police to arrest people without any warrant. Gatherings of more than five people were illegal, i.e. freedom of assembly was non-existing.

In early 2008, Ahmed Maher, an Egypt civil engineer, started a group on Facebook called "April 6 Youth Movement"[7] with the goal to support a planned strike of workers in the town of El-Mahalla El-Kubra [28].

The group served as a virtual meeting place for multiple thousand people. This may not sound much but in a country where police shows up every time ten people meet, this was very important for the whole movement.
As of May 2011, the group has more than 110,000 members.

Activists in Egypt used a combination of social and traditional media to get their ideas to as many people possible [28]. Facebook and blogs were used to gather attention of people online plus they bought small TV ads placed as running texts (which is a common method for making short community announcements in this region) targeting people not having internet access.

At this time, the Mubarak regime seemed to underestimate the power of social networks as a tool for organizing such protests. There are reports of individual bloggers being arrested and prosecuted because they gained too much attention. But because of the great amount of people participating, the April 6 Youth Movement was something completely new.

Despite being able to share opinions online via Facebook, activists of the April 6 Youth Movement almost never met in real life [19].
In [19] the author quotes an activist who describes the April 6 strike as "a practice session for the new generation" and says "It's a rehearsal for a bigger thing. Right now, we are just testing the power of each other." About 2 years later she would be proved right.

3.2. Iran Post-Election Crisis 2009

On 12 June 2009 the latest presidential election was held in Iran where Mahmoud Ahmadinejad competed against three other candidates. The results, declaring Ahmadinejad as winner, were claimed to be imitated by his opponents. This led to a massive wave of protests in following days and weeks called "Green Movement" [15].

Gheidary studied the flows of communication between protesters, activists and other related individuals and organizations such as traditional media. The author detected four pathways of information:

- First pathway: between peers in a crisis zone. Information generation and exchange via spontaneous, event-driven gatherings. E.g. people recording live video footage of a peer being shot and injured.
- Second pathway: between people that generated or received information via the first pathway and their peers outside the crisis area. E.g. uploading the recorded video to a social networking site and therefore making it accessible to all peers connected via that site. Those recipients would then make sense of that information, share and/or re-produce it.
- Third pathway: the third pathway is built automatically. It defines representatives of global traditional media receiving the information spread via the second pathway in the same way grassroots do.
- Fourth pathway: between grassroots inside and such outside the crisis zone mainly throughout OSNs [15]

[7] https://www.facebook.com/group.php?gid=9973986703

The author reports such networks as “flexible, easy to join and leave, and capable of relatively fluid reorganisation following the addition or loss of organisations” [15, p. 4]. Furthermore it is stated that the problem of language (Persian vs. English) complicated the reorganization mentioned before and probably delayed decision-making.

The use of OSNs to spread information from within the crisis zone gave people around the world the chance to gain insight into the situation in Iran [15]. Twitter, Facebook and YouTube played prominent roles in particular. [16]

The authors of [16] analyzed the prominent features of the social network related to the Green Movement [16]. They found the network being a hybrid of centralized and decentralized structures and to have a normal distribution of centrality among actors. This hybrid character has two effects: On one hand, it does not lose its features and optimality regarding information dissemination after removing a limited number of actors. On the other hand there exists a strongly connected core containing few actors that is mainly responsible for induction of information into the network. Therefore it is possible to control the information spread by manipulating those actors.

The network showed three main components which were identified to be (i) the group of protesters (more than 70% of all actors therefore the biggest group), (ii) the group of actors supporting the government (24% of all actors) and (iii) a group mostly consisting of neutral persons and news agencies (2% of all actors). Interestingly the last group was the one producing the most information (tweets).

Even though happenings in Iran raised worldwide attention and US diplomats and other public officials heavily used Twitter as information source (the US State Department even asked Twitter to delay a scheduled server upgrade to ensure availability of the service), [17] concludes with “Our study highlights the limitations of ‘soft power’ and social media technologies for effecting social change.” 2011 protests in Tunisia and Egypt showed the opposite.

3.3. Student Uprisings “#unibrennt” in Austria 2009

Even the name of this movement indicates the importance of social media having for it: its name is a Twitter hashtag.
Started by a relatively small number of students in Vienna in October 2009, this movement is a prime example for protests organized via social media. The use of social media helped to spread news quickly thus expanding the protests to several other universities in Austria and neighboring states [29].
Sevignani and Sandoval discussed media utilization by the unibrennt movement in [24].

The unibrennt movement was not organized or planned by any official organization (e.g. elected student representatives). Instead the protesters formed a grassroots democracy and organized themselves on site (at the occupied AudiMax) and online via Facebook[8], Twitter[9], Flickr[10] and live-streaming of all meetings. Twitter and Facebook were used all the way from the start. On the fourth day after the protests began, a website[11] was put online that aggregated tweets, Facebook messages and blog posts and was used as a

[8] https://www.facebook.com/unsereuni
[9] http://twitter.com/#!/unibrennt
[10] http://www.flickr.com/groups/unibrennt/
[11] http://unibrennt.at/

portal providing all necessary information. A wiki, also available over that main website, was used to coordinate workgroups.

In 2010 the unibrennt movement, in this case called “the ubiquitous unibrennt cloud”, won a prize in the category “digital communities” at Ars Electronica 2010 [30].

3.4. Uprisings in Tunisia 2011: Jasmine Revolution

Protests in Tunisia started end of 2010 and resulted in long-time leader Zine al-Abidine Ben Ali fleeing the country on 14 January 2011.

Although partly blocked by the regime, Twitter and Facebook and other social media were heavily used by protesters to organize the revolt [33].
Austrian newspaper DerStandard conducted an interview ([32]) with Sofiène Ben Haj M'Hamed, an online activist who was committed to the protests.
M'Hamed points out the advantages Facebook has compared to simple blogs. Blogs would in most cases only support text and images, while Facebook provides multiple means of communication (e.g. messaging, chat), photo and video upload and forums. Sending out information via a blog requires the recipients to know the exact URL, on Facebook the social network is used to spread news. Furthermore, blogs are easier to be blocked and/or hacked by the government. Interfering communication via Facebook required the Tunisian regime to temporarily block the whole site.
Asked about other technologies being vital for the movement, M'Hamed named Twitter and Skype. Twitter for real-time coordination of protests on the street and Skype, which provides encrypted telephony, for organization and planning purposes and communication to people outside the country.

Traditional media used Twitter to support news coverage and to post news in-time. The website of The Guardian[12] for example displays a sidebar titled “Tunisia coverage on Twitter” listing tweets by Guardian journalists.

3.5. Uprisings in Egypt 2011

Organized protests in Egypt started on 25 January 2011 and followed the uprisings in Tunisia.
The “April 6 Youth Movement” (see above) was amongst the initiators of these uprisings. After 18 days of mass protest, long-time president Hosni Mubarak stepped down and handed power to the military on 11 February 2011.

Like in Tunisia, social media tools were important for the protesters to mobilize the masses and organize protests.

Three days after protests began, the Egypt government decided to make a radical move and shut down internet access for nearly the whole country [34]. Only some small and one major (Noor Data Networks) internet service provider (ISP) remained online. The latter is providing internet access for the Egypt stock exchange. This of course was to hinder protesters in organizing themselves.

However, those internet blockings could not stop the movement. People started to use old-fashioned modems, landlines and faxes to pass information. This indicates OSNs to be important but not vital for the uprisings.

[12] http://www.guardian.co.uk/world/2011/jan/09/tunisia-clashes-weeks-unrest?intcmp=239

4. Internet Censorship

Since the internet and especially social media empowers people to communicate, share ideas and beliefs and organize gatherings, protests and so on, it became a target of censorship by a variety of organisations ranging from authoritarian regimes to companies.

Methods for censoring the World Wide Web include DNS blocking, IP blocking and URL keyword filtering [3]. Putting pressure on search engines to self-censor their results is done in China for example.
Mostly, the aim of internet censorship is to control the political dialogue (or monologue in some cases), although creating favorable conditions for specific groups of interest (companies, political parties, etc.) may also be a goal.

The open net initiative[13] reports 71 countries around to world to do some kind of internet filtering.

4.1. Censorship countermeasures

Although they might face prosecution and jail-sentences, people affected by internet censorship try to circumvent the blocking in various ways [2].

The use of proxy-servers outside the censored region and onion routing systems such as Tor are the most common and widely known techniques used to access censored information [2]. But since they are so well known, censors may be able to monitor block them too in some way. In addition, those techniques require users outside the censored region to set up and maintain some kind of infrastructure (e.g. proxy servers).

Burnett et al. developed a framework, called “collage” that enables people to communication privately in a censored network without the need of setting up additional infrastructure [2]. They avoid using any encrypted messages in order to not gain attraction by the censors, who are likely to find encrypted messaging suspicious.
Collage uses cover traffic that can be any user generated content (e.g. blog comments, photos, videos) on any website to hide the real message in. The recipient of course has to know about how to decode/extract the information from the cover data. The cover medium must be widespread enough to make it difficult for censors to completely block and remove, yet common enough to provide users some level of deniability when they download the cover traffic.

In July 2010, Samuel Greengard quoted Andrew Lih as follows:
“’The only reason that authorities aren’t more aggressive in tracking down those who circumvent restrictions is that it simply isn’t worth the trouble,’ he says. ‘There isn’t a critical mass of population that’s dangerous to the government.’” [3]
So called “Arab Spring” in 2011 proved this statement to be wrong.

5. Social Web to Support Transparency and Anti-Corruption Measures

Censoring the web is one side but the internet of course can be used in a more positive way. Multiple examples show how governments use ICTs (information and communication technologies) and especially social media as a tool to increase transparency and reduce corruption.

[13] http://opennet.net

Bertot et al. report on some of those example initiatives in [5]. More and more governmental agencies and officials use blogs to provide instant insights for the public. Online social networks have been heavily used recently by politicians in election campaigns. The most prominent example probably is US president Barack Obama. Obama and his team post status messages on Twitter and Facebook on a regular basis. Over 8,100,000 people follow @BarackObama on Twitter, the Facebook-page www.facebook.com/barackobama has over 20,600,000 Likes as of May 2011.

But using social media to strengthen public relations is not always that easy. For example, the US Transportation Safety Administration (TSA) started and removed a blog on its website several times [5]. They found no good way to deal with criticizing blog comments by upset citizens. Instead they heavily edited and removed those comments. In this case the blog was not used to increase transparency but to manage the image of the agency.

Social media may also be used by citizens to increase transparency when traditional media fails to provide well balanced information [5]. Australian media (much of it controlled by the Conservative Rupert Murdoch) openly supported the Conservative party in 2007 campaign for Prime Minister of Australia. Australian citizens did not want to put up with that and started blogs providing contrasting views in order to balance media coverage.

6. Conclusion

Recent happenings in the Arab world showed how important social media technologies are to support freedom of speech and democracy as a whole. Autocratic regimes know that and respond with increased effort in censoring those technologies. But also in presumable democratically developed regions like Europe and the US, openness of the World Wide Web and net-neutrality are more and more under attack. However, Facebook, Twitter & co. gain popularity every day with no end in sight.
It will be interesting to see how usage of online social networks will develop in the future and maybe effect more social changes.

7. References

[1] F.Pakzad, A. Abhari, “Characterization of User Networks in Facebook”, Proceedings of the 2010 Spring Simulation Multiconference, Orlando, USA, 2010; ACM, New York, USA, 2010

[2] S. Burnett, N. Feamster, S. Vempala, “Chipping Away at Censorship Firewalls with User-Generated Content”, Proceedings of the 19th USENIX conference on Security, Washington, USA, 2010; USENIX Association, Berkeley, USA, 2010

[3] S. Greengard, “Censored!”, Communications of the ACM, Vol. 53, No. 7, July 2010

[4] A. Nazir, S. Raza, C. Chuah, “Unveiling facebook: a measurement study of social network based applications”, Proceedings of the 8th ACM SIGCOMM conference on Internet measurement, Vouliagmeni, Greece, 2008; ACM, New York, 2008

[5] J. Bertot, P. Jaeger, J. Grimes, “Crowd-sourcing transparency: ICTs, social media, and government transparency initiatives”, Proceedings of the 11th Annual International Digital Government Research Conference on Public Administration Online: Challenges and Opportunities, Puebla, Mexico, 2010; Digital Government Society of North America, 2010

[6] L. Barkuus, J. Tashiro, “Student socialization in the age of Facebook”, Proceedings of the 28th international conference on Human factors in computing systems, Atlanta, USA, 2010; ACM, New York, USA, 2010

[7] K. Hintikka, “Communication structure and collective actions in social media”, Proceedings of the 14th International Academic MindTrek Conference: Envisioning Future Media Environments, Tampere, Finland, 2010; ACM, New York, USA, 2010

[8] F. McCown, M. Nelson, “What happens when facebook is gone?”, Proceedings of the 9th ACM/IEEE-CS joint conference on Digital libraries, Austin, USA, 2009; ACM, New York, USA, 2009

[9] T. Cohen, B. Clemens, “Social networks for creative collaboration”, Proceedings of the 5th conference on Creativity & cognition, London, UK, 2005; ACM, New York, USA, 2005

[10] H. Kwak et al., “What is Twitter, a social network or a news media?”, Proceedings of the 19th international conference on World wide web, Raleigh, USA, 2010; ACM, New York, USA, 2010

[11] A. Joinson, “Looking at, looking up or keeping up with people?: motives and use of facebook” Proceeding of the twenty-sixth annual SIGCHI conference on Human factors in computing systems, Florence, Italy, 2008; ACM, New York, USA, 2008

[12] J. Brundidge, “The Contemporary Media Environment and Breadth of Communication: The Contribution of the Internet to the Heterogeneity of Political Discussion Networks”, presented at the annual meeting of the International Communication Association, Montreal, Canada, 2008

[13] B. Huberman, D. Romero, F. Wu, “Social Networks that Matter: Twitter Under the Microscope”, 2008, Available online at SSRN: <http://ssrn.com/abstract=1313405>

[14] H. Chen, M. Sali, “A Qualitative Study of Iranian Facebook Users’ Perceptions of Using Facebook in Iran’s eParticipation Activities”, Sweden, 2010

[15] L. Gheidary, “Social media and Iran’s post-election crisis”, Proceedings of the 7th International ISCRAM Conference, Seattle, USA, 2010, Available online at SSRN: <http://ssrn.com/abstract=1656466>

[16] K. Khonsari et al., “Social Network Analysis of Iran's Green Movement Opposition Groups Using Twitter”, Proceedings of the 2010 International Conference on Advances in Social Networks Analysis and Mining, Odense, Denmark, 2010; IEEE Computer Society, Washington, USA, 2010

[17] A. Burns, B. Eltham, “Twitter Free Iran: an Evaluation of Twitter's Role in Public Diplomacy and Information Operations in Iran's 2009 Election Crisis”, Communications Policy & Research Forum 2009, Sydney, Australia

[18] F. Shirazi, “The Ccontribution of ICT to Freedom and Democracy:
An Empirical Analysis of Archival Data on the Middle East”, The Electronic Journal on Information Systems in Developing Countries, Vol. 35, pages 1-24, 2008

[19] S. Shapiro, “Revolution, Facebook-Style”, New York Times Magazine, 2009, Available online at: <http://www.nytimes.com/2009/01/25/magazine/25bloggers-t.html?pagewanted=all> (retrieved on 20 May 2011, 09:00)

[20] T. Heverin, L. Zach, “Microblogging for Crisis Communication: Examination of Twitter Use in Response to a 2009 Violent Crisis in the Seattle-Tacoma, Washington Area”, Proceedings of the 7th International ISCRAM Conference, Seattle, USA, 2010

[21] M. Mendoza, B. Poblete, C. Castillo, “Twitter Under Crisis: Can we trust what we RT?”, 1st Workshop on Social Media Analytics, Washington, USA, 2010; ACM, New York, USA, 2010

[22] C. Castillo, M. Mendoza, B. Poblete, “Information Credibility on Twitter“, Proceedings of the 20th international conference on World wide web”, Hyderabad, India, 2011; ACM, New York, USA, 2011

[23] S. Vieweg et al., “Microblogging During Two Natural Hazards Events: What Twitter May Contribute to Situational Awareness”, Proceedings of the 28th international conference on Human factors in computing, Atlanta, USA, 2010; ACM, New York, USA, 2010

[24] S. Sevignani, M. Sandoval, „Das Realismusproblem von Gesellschaftskritik in der Mediengesellschaft. Am Beispiel der Studierendenbewegung Unibrennt“, Momentum Kongress 2010, Track #8: Hegemonie in der Mediengesellschaf, Hallstatt, Austria, 2010

[25] S. Milgram, “The small world problem”, Psychology today, Vol. 1, pages 61–67, 1967

[26] A. Watters, “How Recent Changes to Twitter's Terms of Service Might Hurt Academic Research”, Available online at: <http://www.readwriteweb.com/archives/how_recent_changes_to_twitters_terms_of_service_mi.php> (retrieved on 22 May 2011, 15:00)

[27] 140kit.com, “Regarding Twitter's API Rules and Data Export”, Available online at: < http://140kit.com/documents/Regarding_API_Change.pdf> (retrieved on 21 May 2011, 13:00)

[28] D. Wolman, “Cairo Activists Use Facebook to Rattle Regime”, Wired Magazine, 2008, Available online at: <http://www.wired.com/techbiz/startups/magazine/16-11/ff_facebookegypt?currentPage=all> (retrieved on 21 May 2011, 18:00)

[29] “Chroniken: ‘Was bisher geschah’”, Available online at: <http://unibrennt.at/wiki/index.php/Chroniken:_%E2%80%9CWas_bisher_geschah%E2%80%9D> (retrieved on 22 May 2011 10:00)

[30] “Unibrennt gewinnt Ehrenpreis der Ars Electronica”, 2010, Available online at: <http://unibrennt.at/?p=15448&lang=de> (retrieved on 22 May 2011 11:00)

[31] D. Boyd, N. Ellison, “Social Network Sites: Definition, History, and Scholarship”, Journal of Computer-Mediated Communication, Vol. 13, No. 1, pages 210-230, 2007

[32] “Blogger der Jasmin-Revolution”, DerStandard, 9 April 2011, Vienna, Austria, Available online at: < http://derstandard.at/1301874185955> (retrieved on 23 May 2011 19:30)

[33] “Tunisia protesters use Facebook, Twitter and YouTube to help organize and report”, Los Angeles Times, 14 January 2011, Available online at: <http://latimesblogs.latimes.com/technology/2011/01/tunisia-students-using-facebook-and-twitter-to-organize.html> (retrieved on 23 May 2011 20:00)

[34] “Ägypten ist offline und ohne Mobilfunk”, heise online, 28 January 2011, Available online at: <http://www.heise.de/newsticker/meldung/Aegypten-ist-offline-und-ohne-Mobilfunk-4-Update-1179102.html> (retrieved on 23 May 2011 20:30)