Social, Legal and Ethical Aspects of Online Communities and Social Networks

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Abstract – Use of social networks and the number of people participating in online communities have exploded in recent years. As more of the population becomes connected online, there are many significant social, legal and ethical issues brought about by this cultural shift. This portfolio highlights these important issues, and predicts how they will evolve as the growth of the online communities increases.

1. Introduction

Social networks and online communities have become an increasingly important part of people's social lives and popular culture since they first began appearing in various forms following the increasing availability of the internet. As each day goes by, news emerges of the latest hot company, the latest big valuation of a company in the online social space, and a newly noted effect this trend is having on our global community.

Online communities and social networks differ in the sense that an online community needs some kind of method of communication in order to remain in contact, and often this is in the form of a social network. There are many communication mechanisms available on the web for this scenario, including e-mail, instant messaging, and social networks. Just as many people now have e-mail addresses, more and more people are creating profiles on the various social networks available. You can have an online community for an offline product or service, so long as there is a medium online in which it can operate.

As the size of social networks and online communities have grown to comprise of larger and larger percentages of total populations, their collective influence in the population has increased. This portfolio is an exploration of the social, legal and ethical impacts on the whole population caused as a result of these social networks and communities.

2. Background

The world of online social networking and communities has been growing ever-quicker in the past 3 years. Yet there were a phase of social sites in advance of the current crop which are still going strong today. Myspace was formed in 2003, and in many ways was the first truly mainstream social network which impacted large proportions of the general population. While there had been many online communities in advance of this, in the form of e-mail lists, IRC chat rooms, bulletin boards and so on, these were largely the reserve of more technical users. Myspace offered users an opportunity to post blogs, share music, customise their profile, and keep friends lists long before Facebook was even conceived. Myspace's parent company Intermix Media was bought by News Corp. in July 2005, with its traffic at 2 million registered users per month and featuring 18.5 million members in the 16-34 year old demographic [1]. Myspace was and still is largely a young person's social network; even in 2010, 33% of its users were under the age of 17, second only in the US to Bebo [2].

In the same year as Myspace's acquisition, another sharing site was just starting up. YouTube was announced in April 2005; its early users were mostly Myspace users looking for a quick and easy way to embed videos in their Myspace profiles. Following substantial growth in its first year, it took $5 million in funding from Sequoia Capital (a VC firm still active in Silicon Valley today) in October of the same year [3]. Feeling that their recently launched Myspace Video service was under threat, in December of 2005 Myspace (under orders from News Corp. bosses) systematically began removing any references to YouTube from user profiles. Not only video embeds, but links to and mentions of the up-and-coming site were replaced with ".." [4]. Users in the now-mature Myspace community were understandably outraged by this [5]; it was by no means the first nor the last instance of censorship [6]. YouTube eventually overtook Myspace in terms of traffic in July 2006 [7]; however it is considered more to be an online community (those who enjoy creating video and others looking for video entertainment) rather than a social network (populated with

users of many diverse interests). Nonetheless, its impact in the social space has been extremely significant.

Facebook was first launched in February 2004 as "The facebook", restricted to Harvard University students only; within 1 day 1,200 students were signed up and in a month over half of the students at the University had signed up. The social network switched domain to facebook.com in August 2005 and expanded; first to US high schools in September of the same year and subsequently UK universities in October [8]. Facebook's growth continued to surge, but it wasn't until the end of 2008 when it eventually overtook Myspace for traffic in the United States [9] [10] (by early 2009 it was twice as big, as Myspace's traffic flatlined and Facebook's rose globally [11] [12]).

Twitter was first conceived in March 2006 and was originally used internally, at a small company named Odeo, by the co-founders. Following its public release, it first caught on at the South by Southwest conference in March 2007, where usage climbed from 20,000 tweets per day to over 60,000 tweets per day over the course of the conference [13]. Its growth increased at a steady pace through 2008 [14], with 70% of the users at the end of 2008 having joined in the previous 12 months [15]. Finally at the end of 2010 Twitter passed the ailing Myspace in terms of unique users [16]. Twitter is a social network popular initially with technical users (owing to the South by Southwest conference) but in recent years expanding increasingly into more general users; it has always been popular with brands and marketers as an excellent social platform for viral and organic growth.

Of course, in this time, other online communities had been growing with the new communication mechanisms faster and more reliable internet access brought. Even as recently as January 2010, the Voice over IP application Skype had more registered users than Facebook [17] and has a dedicated user base who, in many cases, use Skype exclusively for dealing with business calls. Blogging has been an extremely popular method for online communities to spread news and keep in contact. Blogger.com emerged during the dot-com boom, and grew from "hundreds of thousands" of users in 2002 when it sold to Google [18] to over 8 million users 3 years later [19]. Wordpress.com, which hosts an estimated 50% of the blogs online powered by the Wordpress software [20], hosts over 16 million blogs (gaining 2.3 billion monthly page views) [21].

It is easy to forget that Facebook, Twitter, YouTube and the like are popular only in the Western world. In the far east, social networking in China is dominated by renren.com (人人网) and kaixin001.com (开心网) which are both ranked in the top 150 websites worldwide despite being private social networks and only available in Chinese [22] [23]. Meanwhile Orkut is by far and away the biggest network in India and Brazil, both very large internet populations, and the highly technical Japan is dominated by mixi.jp and Twitter Japan [24].

It has widely been agreed that 2010 truly was the "Year of Social" online [25]. Some of the biggest stories of the year were started or widely spread through online social websites [26]. Facebook was the most-searched for term in the UK in 2010 [27]; it's the second biggest referrer of video views (behind Google) [28]; and it's now the third largest website on the internet (passing Yahoo!) [29]. It's the biggest social network in the US, doesn't figure at all in Japan, and is second to Google's Orkut in India [24], all enormous markets. Twitter has seen gigantic growth online [30], and there are countless small companies starting in the space promising to make the future extremely bright for online communities.

3. Topic Articles

This section presents sources of information on the effects online communities and social networks are having on global society.

1. Twitter

"Tron" Still King on Twitter, Despite Box Office Rivals

The movie Tron: Legacy is mentioned in a higher number of tweets (on average more than twice as many per hour) than the two movies that beat it in the US Christmas Box Office, but users are more critical of it with only 60% of tweets judged to have a "positive sentiment" against 65% and 68% for its competitors. [31]

Investment fund set to use Twitter to judge emotion in the market

Following research showing that user sentiment on Twitter accurately predicted whether the Dow Jones index closed up or down on a given day (87.6% accuracy), Derwent Capital Markets is to launch a $25m fund using algorithms that result from the research. [32]

Double Rainbow Appears Over L.A., Twitter Explodes in Meme Catchphrases

Following the massive viral popularity of the Double Rainbow Meme earlier in 2010 (Meme: [33]; Explaination: [34]), when a double rainbow appeared over LA at the end of the year, the Twitter community exploded in thousands of meme-based rainbow tweets, wedging "Double Rainbow" as a worldwide trending topic. [35]

Conan O'Brien Is Webcasting for 24 Straight Hours

A 24 hour live stream of comedy by displaced TV comedian Conan O'Brien and his team goes viral on the web, with traffic driven from Twitter and featuring content pulled from the social network. [36]

Conan's First Guest to be Determined by Twitter Vote (Maybe)

Once again Conan O'Brien and his team take to Twitter to increase awareness of his season premiere, asking Twitter users to vote from a list of 12 who they would like to see on the first show. [37]

Twitter "Pale Whale" Unveiled to Celebrate Tonight's Premiere of "Conan"

Another marketing campaign from Conan O'Brien goes viral, this time an image created by the creator of Twitter's "Fail Whale" image (displayed when the site is unavailable). [38]

Conan O'Brien returns to TV with an epic introduction

The introduction to Conan O'Brien's first show on US TV network TBS goes viral following a crowdsourced campaign and Twitter marketing strategy. [39]

Twitter raises $200m in new finance

The BBC report a new round of financing for Twitter, following on from their previous $100m round. It also reports 300 employees and 175 million registered users for the service. [40]

Fluther Flocks to Twitter

Twitter purchase the social question and answer service Fluther as a talent acquisition (see [41]). While Fluther will remain a separate product, this may lead to Twitter including features that give it a Q&A capability – there are already many questions asked and answered by experts on Twitter every day. [42]

How Twitter acquires people

Additional coverage of the Twitter / Fluther deal with questions to Twitter's spokesperson Carolyn Penner. It speculates that the purchase is another in a long line from larger companies in the space, where smaller companies are acquired for their exceptional personnel or team rather than their product or revenues. [41]

Lord Chief Justice allows Twitter in court

This article covers a decision by the Lord Chief Justice to permit observers in court to tweet the proceedings via mobile devices as they occurred. Following journalists and members of the public tweeting the court hearing of Wikileaks founder Julian Assange, the interim guidance was produced as it was seen not to intervene with justice proceedings so long as the phones were silent. [43]

Rory Cellan-Jones on what you can and can't tweet on Twitter

BBC technology journalist Rory Cellan-Jones (a well-known tweeter as @ruskin147) presents a 1-minute video with 3 cases of tweeted jokes backfiring. [44]

A hell of a time

Google employee Noirin Shirley posts a personal blog post, naming a Twitter engineer and alleging he sexually assulted her at an ApacheCon after-party. The post explodes with over 300 comments within 24 hours and causes an outrage on Twitter. [45]

Googler Accuses Twitter Engineer Of Sexual Assault, Trial By Twitter Commences

TechCrunch follows up on the personal blog post of a Google engineer, accusing a Twitter engineer of her sexual assault. The post gained over 800 retweets [46], and highlights how the news was spread via Twitter and other social networks. Note: the original web page has since been taken offline; a cached copy has been reproduced in Appendix 1. [47]

SEC Probes Trading in Private Companies Including Facebook and Twitter

Shares in Twitter and Facebook are hot property; so hot, in fact, that people are buying and selling them even though they are not floated on registered stock exchanges. These black markets may be violating the US Securities and Exchange Commission's rules that there may be no more than 499 shareholders in a company of that type. [48]

Tweeters are being sued for defamatory comments

Video of media lawyer Paul Gilbert and comedian David Schneider discuss the Paul Chambers trial and other stories involving legal cases and Twitter users. Users posting defamatory comments on Twitter can still be sued, but it is argued that context is everything and the trial was taken too far. [49]

Twitter anger over bomb tweeter

Twitter users revolt when Paul Chambers is convicted and fined for posting a joke message on Twitter threatening to blow up Robin Hood Airport if it is closed during a bad weather period. Hashtags #twitterjoketrial and #IAmSpartacus trend in the UK and worldwide, and thousands of users retweet his original tweet with the #IAmSpartacus hashtag. [50]

Man in Twitter bomb threat against airport loses appeal

Paul Chambers' first appeal fails against his conviction of sending a menacing electronic communication. Through Twitter, actor and comedian Stephen Fry promises to pay his fine, reinforcing a growing wave of community support for the convicted accountant. [51]

Twitter airport 'joke' trial heads to the High Court

The saga of the community-named "Twitter Joke Trial" continues, with Paul Chambers taking his conviction to the High Court for appeal. [52]

A World of Tweets

A roundup of the impact Twitter is having across the world. Includes details of its effect in Chile (a 500% signup spike since the earthquake); China; Haiti; Russia (a 300% signup spike after President Medvedev signed up at Twitter HQ) and more. [53]

The Revolt of China's Twittering Classes

More on the effect Twitter is having in China (see [53]). Despite the service being banned, it is still used through services that can bypass the "Great Firewall of China". Despite no mention of Liu Ziaobo (a human rights activist in China) being awarded the 2010 Nobel Peace Price in the mainstream Chinese media, Chinese microblogs continued to spread the news. Twitter is forcing a change to local news reporting by the population itself. [54]

Chinese woman jailed over Twitter post

A Chinese human rights activist is sentenced to a year of "re-education through labour" at the Shibali River women's labour camp for retweeting a tweet by her husband and adding "charge, angry youth". [55]

Healing Haiti

Twitter co-founder Biz Stone publishes on their official blog methods of helping disaster survivors in Haiti; he includes a list of Twitter accounts that are reporting events and aiding on the ground. [56]

A Guest Post from Haiti

An American expat who lived in Haiti when the earthquake struck in January 2010 writes on how Twitter allowed for communication across the country when the phones were offline and no other communication was available. [57]

A Triumph for Chile

A roundup of the Twitter coverage of the successful rescue of 33 Chilean miners following a collapse. Over 2 million related tweets were posted on the day of the start of the rescue (13th October 2010), and the Chilean President had used Twitter to promise that everything possible would be done to enact a successful rescue at the beginning of the disaster. [58]

Evan Williams, Master of the Privacy Game

The often controversial and outspoken TechCrunch editors publish a review of how one of Twitter's co-founders manages to remain mostly out of the public spotlight, despite having a high profile in the tech industry. [59]

Fake Tsunami Warning Sent from Hacked Twitter Account

A Twitter account belonging to the disaster management adviser to the Indonesian President was broken in to, and a tweet reading "Jakarta tsunami tomorrow" in Indonesian was sent. Widespread panic through the Indonesian Twitter community was reported, until the account was taken back under the adviser's control and the message removed. [60]

Twitter feed for all Greater Manchester Police work

Greater Manchester Police embarked on a 24-hour experiment where every single 999 call to the force was published on Twitter. Brief outlines in under 140 characters (and sometimes with updates on the resolution of a call) were posted for a 24 hour period, in an attempt to raise awareness of the social issues police are required to deal with in addition to the metrics that are more widely recorded and reported. [61]

Meaningful Growth

Twitter reports 25 billion tweets sent in 2010, and 100 million new registered accounts since the start of the year. The company has grown from 130 to more than 350 people. [30]

In-stream Ads Appearing On Twitter Today

Twitter launched its in-stream advertising service, with clients including Starbucks, Virgin and Red Bull. The product uses a combination of tweet content, followers and people a user follows to determine which, if any, adverts to show a user. [62]

How Much Is a Tweet Worth? $500, Says Toyota

Details are published of a Toyota promotion in the US, where purchases of a new Toyota during their sales event are rewarded with a $500 rebate if they tweet the pre-defined message through the service before they purchase the car. [63]

<u>"I will dig you out."</u>

Newark's mayor Cory Booker used Twitter to mobilise snow plows and rescue teams, helping some people himself, when the city was caught by surprise with a blizzard that dumped 2 feet of snow. Citizens contacted him directly and he used the information to coordinate clearing of the streets and helping those requiring medical assitance and with disabilities. [64]

<u>2010 Trends on Twitter</u>

Twitter published an analysis of the 25 billion tweets sent in 2010, with the number one trend being the Gulf oil spill. Also in the top 10 were the World Cup, the Haiti earthquake, "Vuvuzela", the iPad, Android and Justin Bieber. The number 1 movie was Inception. [65]

<u>The people who use Twitter</u>

6% of the US adult population uses Twitter and the highest use is among young adults (age 18-29), black and hispanic minority groups. 24% of internet users use Twitter or another service along the same lines, up from 6% in mid-2008. [66]

<u>The 10 Most Powerful Tweets of 2010</u>

Twitter publish a list of the "most influential" tweets posted during 2010. They include a tweet that persuaded the US Army to permit a Doctors Without Borders plane to land in Haiti following the earthquake; the President of Ecuador announcing a state of emergency; Clarence House announcing the engagement of Prince Harry and Catherine Middleton on Twitter; and the spoof @BPGlobalPR account's "Catastrophe is a strong word, let's all agree to call it a whoopsie daisy" following the Gulf oil spill disaster. [67]

<u>Are Your Tweets Boring or Beneficial?</u>

A MIT researcher has created a service where users can have their tweets rated with how interesting they are. The service uses Amazon's Mechanical Turk to procure extra helpers to screen tweets, and then dispatch the results to the user. It is hoped the project will be used in a research paper. [68]

<u>Twitter name @theashes brings cricket fame to US woman</u>

Illustrating the power of an online community following an event, a Canadian tweeter who happens to have "theashes" username gets inundated with "mentions" on Twitter during the cricket match in Australia by users not checking if it actually is a valid account [69]. She capitalises by selling "I am not a freaking cricket match" t-shirts, and is later given a free flight to Australia by Qantas and American Express [70].

Other items relevant to Twitter: [71] [72] [73]

2. Facebook

How Facebook eclipsed Google in 2010

According to data from web analytics firm Hitwise, Facebook was the most visited website in the US in 2010, ahead of Google. While Hitwise's data isn't official figures, this has substantial implications for the social network's growth, eclipsing the search engine that has been the most visited site for years before. [74]

Facebook by the Numbers in 2010

Some astonishing statistics on the usage of Facebook during an average 20 minute period: 2.7 million photo uploads (that's 2250 per second), 7.6 million pages liked, 1 million shared links, 1.8 million status updates and 10.2 million comments. [75]

The Year of Facebook: U.S. Traffic Has Grown by 55% in the Last Year

Facebook traffic in the US grows by 55% over the course of 2010 according to ComScore – 97.37 million unique US visitors in October 2009 compared with 151.13 million unique US visitors in October 2010. [76]

Access denied: Facebook is banned…where, exactly?

While bans of Facebook by various governments worldwide generally get some attention, it's not so obvious when it's lifted. Facebook is available in most countries worldwide, with most bans lasting from days to a few weeks at most. [77]

Saudi Arabia Bans Facebook

Saudi Arabia has banned Facebook due to it not conforming to the kingdom's values – but the ban is apparently temporary. [78]

2010, the year that privacy died?

A reflection on the year in headlines during 2010, where Google and Facebook both made significant slip-ups inadvertently releasing users' data. [79]

Giving You More Control

Facebook announces the new Groups feature, enabling improved management and broadcast to a limited subset of a user's social graph. This follows the trend of a number of services offering limited groups of people social networking capabilities. [80]

More Ways to Stay Secure

Facebook announces new security features, including one time passcodes to access the site on public computers, the ability to sign out of Facebook remotely, and enhanced security information to aid account verification. [81]

Facebook foils Israel's female draft dodgers

The Israeli Army is using Facebook to check up on women who lie about their religious background in order to get out of military service. 1000 women tried to get out of the 2 years mandatory military service for women over 18 by claiming to be Orthodox Jews but were found out when their Facebook profiles revealed habits which showed this to be untrue. [82]

Police warn of burglary risk from social media sites

Among an increasing wave of crime, Facebook is being blamed by more people for thefts. Too much information being exposed on the social network site is allowing potential burglars to figure out where and when houses will be empty. [83]

Facebook Brings Facial Recognition to Photo Tagging

Facebook introduced a new feature when uploading photos to the service; face detection and recognition algorithms are run on the photos, and instead of users manually tagging people in each photo, the service can suggest them automatically. [84]

 What Might Zuckerberg's Visit to Baidu Mean, If Anything?

Mark Zuckerberg visited Baidu, China's leading search engine, while in Beijing in December 2010. There is much rumour and speculation that Facebook will be making a push into China, which would inevitably involve some kind of compromise with the Chinese government. [85]

 "The Social Network" Snaps Up a Trio of Prestigious Awards, Is an Oscar Next?

The so-called "Facebook Movie" receives 4 NBR awards in the US, for Best Film, Best Director, Best Actor and Best Adapted Screenplay. The effect of Facebook on the movie industry is clear. [86]

Anti-Fur Protesters Take Over DKNY's Facebook Page

In an online form of protest, anti-fur protestors spelt a message out on DKNY's Facebook page. They object to the brand's use of real animal fur in its products. [87]

Estranged Facebook Co-Founder No Longer At War With The Social Network

The Facebook co-founder who always gets forgotten, Eduardo Saverin, writes a guest post on CNBC clearing the air between him and Facebook following the resolution of a court case in which he was an awarded a settlement worth an estimated $1.1 billion in Facebook shares. [88]

Facebook looks to trademark the word 'face'

Facebook is attempting to trademark the term 'face' in the context of online sites and services used to exchange messages. While Facebook refuses to comment, such a move may hinder services such as Apple's FaceTime. [89]

Google turns off Gmail data feed

Google turned off the ability for Facebook to import a users' contacts from Google Mail (Gmail) protesting that Facebook led users to a "data dead end" where they could not export the information they put in the social network. [90]

The clever new Facebook app that is the only way to import your Google contacts

Following Google turning off the capability of Facebook to import Gmail contacts to ths social network, an enterprising individual has created a Facebook application that helps to check your Facebook contacts against your Gmail addresses to find new friends. [91]

Facebook Removing Gmail From List Of Third Party Email Providers

Facebook removes the Gmail import from its website in response to Google's removal of the feature from its Gmail product. [92]

Google No Longer Claims Facebook Will "Trap" Users. Or Do They?

Following Google terminating Facebook's access to Gmail to import a user's contacts, Facebook used a workaround hack to get the data. Google then responded by displaying a large warning message about importing data into Facebook. Google and Facebook then appeared to come to an agreement, and the service was eventually restored to normal. [93]

Facebook Will Allow Email Exporting — But Only of @facebook.com Addresses

Following Google claiming Facebook were a "data dead end", Facebook announces that the new @facebook.com e-mail addresses will be available to users to export from the service if they so desire. [94]

CityVille Passes FarmVille, and FarmVille Gets a Chinese-Language Version

The CityVille game from Facebook's largest application creator Zynga passes the company's previous largest application FarmVille, topping 61.7 million monthly active users and 16.8 million daily active users. CityVille has been growing at a rate of 3 million monthly users per day and shows no sign of slowing. [95]

Other items related to Facebook: [96] [73] [48]

3. Wikileaks

WikiLeaks Targeted in DDoS Attack as Latest Leak Hits the Web

Just as WikiLeaks were about to release the first batch of secret US Embassy cables, the website was taken down by hackers in a distributed denial-of-service attack. The organisation announced the news via its Twitter account [71]. A hacker later took responsibility for the attack [97]. Another so-called DDoS attack struck the site 2 days later, consuming 10 gigabits of data per second [98].

Visa under attack from Anonymous, payment processors, as WikiLeaks war escalates

Online activists "Anonymous" took the Visa website down in response to it cutting payments to Wikileaks following the release of secret US Embassy cables [99]. Paypal, MasterCard, and a swiss bank's website were also later taken offline by similar attacks [100] [101], and Amazon.com also threatened in subsequent days of online disruption [102]. "Operation Payback" also targeted fax machines [103] and websites of the Zimbabwean government [104].

WikiLeaks Downed By Its DNS Service Provider

Wikileaks' DNS provider removed its domain name from its records following multiple DDoS attacks. It took time for the site to fully recover, eventually settling on hosting in Switzerland with the address "wikileaks.ch". [105]

Why Amazon Dropped WikiLeaks

Wikileaks was formely hosted on Amazon's cloud service AWS (Amazon Web Services), but was removed because it did not obey the AWS Terms of Service. There was a delay in removing it because customers of AWS are not pre-screened, so it had to be brought to Amazon's attention [106]. Eventually Wikileaks also gained hundreds of mirrors donated by the public [107].

Bank of America Blocks WikiLeaks Payments

In addition to PayPal [108] and the Swiss bank formerly holding Julian Assange's account, Bank of America also prohibited payments from being made to Wikileaks citing "inconsistencies with its internal policies for processing payments". [109]

Confirmed: Operation Payback Facebook Page Pulled by Facebook

Following the attacks online attributed to Operation Payback, Facebook took down the Operation Payback Page on the social network citing their Statement of Rights and Responsibilities [96]. Twitter were also forced to clarify that they were not censoring Wikileaks from trending on the service [110].

FBI raids Texas colocation facility in 4chan DDoS probe

The FBI stepped in and targeted a network in Texas that was suspected of being hijacked for use in the "Anonymous" group's operations when taking down PayPal. [111]

WikiLeaks: Who are the hackers behind Operation Payback?

A dive into who "Anonymous", the loosely-knit band of internet users, are and how they are bringing down website after website with coordinated attacks. [112]

Behind The Scenes at Anonymous' Operation Payback

An article interviewing the spokesman of "Anonymous" on topics including Operation Payback and Wikileaks. The interview is also interesting in that both the interviewer and interviewee have anonymous identities, the former being "Ernesto" of TorrentFreak. [113]

Anonymous Shifts On WikiLeaks Strategy, Announces It With A Press Release

Following their disruption of numerous sites online for acting against Wikileaks, the "Anonymous" group released a press release stating their new intentions of an educative approach towards the issues they were protesting. [114]

Other items relevant to Wikileaks: [43]

4. Gawker

Gawker hack triggers password resets at major sites

Over 1 million rows of the users database table for the Gawker blog network were stolen. The e-mail addresses of the users were immediately available, and due to a security flaw in the Gawker system many passwords were recovered too. The effect of the release of the data was felt across the internet. [115]

The Top 50 Gawker Media Passwords

Following the hack of Gawker's users database, analysis confirmed a surprising number of people used extremely simple passwords in order to access their accounts. [116]

WARNING: Acai Berry Twitter Attack Spreading Like Wildfire

Due to a large number of users using the same e-mail address and password to access multiple sites, Twitter accounts of those with simple passwords in the Gawker database were soon hacked and tweeting links to dangerous websites. [72]

The Dirty Truth About Web Passwords

A detailed technical description of the series of errors that caused serious problems for Gawker and the million or so users whose e-mail addresses and passwords were stolen from the compromised website. [117]

5. Delicious

Leaked Slide Shows Yahoo Is Killing Delicious Other Web Apps

An internal Yahoo! slide leaked to tech journalists apparently shows Yahoo!'s intention to "sunset" Delicious, a popular social bookmarking service it purchased in 2008 [118]. Fans of the service were outraged, and the post nearly hit 2000 retweets [119].

Delicious In Purgatory

Following the leak, rumours of up to 5 potential buyers for Delicious fizzle out after it emerges Yahoo! turned down a $15 million offer in 2009, and most interested would not want to exceed $5 million. Additionally, the technology powering Delicious is now well ingrained into the Yahoo! architecture, making it difficult to move out. [120]

Delicious's Loss Is Startups' Gain As Users Jump Ship

Again following Yahoo!'s leak that they will be "sunsetting" Delicious, 5 competing startups have seen huge traffic spikes, including a 102% increase in reach for one called pinboard.in. [121]

6. Skype

Skype Hits New Usage Record

The popular Voice over IP service Skype exceeds 25 million concurrent online users for the first time, which is over a quarter of the size of Verizon, the largest mobile phone network in the US. [122]

Skype Down for Many Users

Skype goes down for nearly 24 hours, following a failure in its peer-to-peer networking technology caused by a faulty client software version. [123]

CIO update: Post-mortem on the Skype outage

Lars Rabbe, Skype CIO, writes a detailed description of the problem that caused the major Skype outage. The fault is laid with a faulty version of the Windows client, which under certain conditions caused the peer to peer network that powers Skype to become unstable. All paying Skype users would later get a $1.00 voucher for Skype credit. [124]

Skype to be banned in China as regulators restrict VOIP services

The Chinese government is planning to block non-sanctioned VOIP services in the country using the "Great Firewall of China". Shortly following the announcement of video call support over Wifi and 3G in the iOS version of Skype, the move is expected to benefit the VOIP services of China Unicom and China Telecom. [125]

7. Reddit

Reddit Political Action Committee: We're Not Happy With the New Net Neutrality Rules

The Reddit Political Action Committee, or "Open Source Democracy Foundation" as they are now known to avoid Reddit's owner Condé Nast's lawyers, has spoken out against the proposed Net Neutrality rules in the United States. [126]

Microsoft tries to woo Gmail users to Hotmail on Reddit, politely eats crow

Reddit has a Q&A style of posts called "AMA" (standing for "Ask Me Anything"); the Microsoft Hotmail team took to Reddit to get feedback from the community. They took heavy fire on all fronts, including over why they support proprietary (Exchange ActiveSync) over open protocols (there is no IMAP support in Hotmail), spam, and many other topics. [127]

8. General

HOW TO: Use Amazon's New Kindle Lending Feature

Amazon launches a new social feature on its Kindle e-book platform, allowing users to "loan" purchased e-books to other users for 14 days. [128]

Everything's connected: Why all marketing will become social

With Facebook's 500 million users spending 700 billion minutes per month on the social network, it is predicted that online advertising spend will grow 14% to over $50 billion in 2011. [73]

Celebrating our partners' success

13 million hours of content were uploaded to YouTube in 2010, and 700 billion videos were watched on the site. The blog post tells the story of small-scale video producers helped with grants from YouTube. [129]

MySpace layoffs: 550 fewer friends at the office?

It is rumoured that former social networking darling Myspace may have to lay off half of its 1,100 staff following dropping traffic and revenues, and pressure from parent company News Corp. [130]

4. Key Issues

1. Social Networks

Facebook is by far and away the most popular social networking service globally; in 2010 it was more popular in the US than Google according to Hitwise [74]. It grew 55% over the year [76], now has over 500 million active users spending 700 billion minutes per month on the site [73], and in one 20 minute period typically deals with 2.7 million photo uploads, 1.8 million status updates and 10.2 million comments [75]. The platform is so large it has allowed other companies to thrive off its "Applications" service. Social games creator Zynga makes the currently most popular games on Facebook, with the largest acquiring 61.7 million active monthly users at the end of 2010 [95]. Zynga has estimated revenues of over $500 million anually [131]. The sheer size of the social network now produces widespread effects in the global community; significant changes on the site are often lamented, and people of all ages and all walks of life use it to communicate with friends, organise events and share. In fact, Facebook has the most evenly distributed age demographic of all social networks [2].

Twitter is a social network capable of spreading highly influential communication. While the service itself is fairly simple, it is the often the messages it conveys and the users it hosts that cause impact on a global scale, reaching every corner of the world. As a company, Twitter has more than doubled in size in 2010, and has added 100 million new user accounts in the same period with 25 billion tweets being sent [30]. Topics discussed widely on Twitter cover every possible topic, and in 2010 included the Gulf oil spill, the World Cup, the iPad and more [65]. 6% of adults in the US and 24% of US internet users use Twitter or a similar service [66]. Debates rage on Twitter as passionately and as widespread as they do in offline communities [45] [47].

As Twitter has rapidly grown, it has presented some legal issues as it has gone along. It has raised two rounds of funding for $100m and $200m [40], but with the company being so hyped (especially by the tech community}, it is now under investigation by the US Securities and Exchange Commision for possibly breaking rules regulating the number of shareholders a company of its type can have, along with Facebook [48]. Its hiring strategy has also been discussed: it recently "acquired" a company by hiring all of its staff [42], a move similar to that of other technology companies (such as Facebook and Google), but its method raised questions [41].

Twitter is also a fruitful environment for marketers looking to create the next viral hit. The service has presented a new form of targeted advertising which has become popular with huge clients worldwide [62]; due to its wide market segment, large reach and realtime nature, it is an effective platform for promotion. Marketers have started offering discounts and offers to Twitter users, and in one case Toyota in the US was offering a $500 rebate on Toyota cars if you tweeted a certain message before you bought the car; while acquiring many tweets, it is unclear to what extent the campaign succeeded [63]. During The Ashes cricket series at the end of 2010, a Twitter user who happened to have the username @theashes on the service was inundated by mentions by people who where meant to be referring to the cricket tournament. She started capitalising on her new-found online celebrity status by selling "I am not a freaking cricket match" t-shirts, and was given a free flight to Australia by Qantas [69] [70].

Owing to the size of the Twitter community, it can have a large and lasting impact and influence of the wider non-tweeting community. It has been shown that Twitter is now sufficiently populated to accurately reflect the mood of entire countries of people, to the point where this sentiment can be analysed to accurately predict stock market behaviour [32]. However, care must be taken, as Twitter still tends towards a demographic that may not ultimiately correlate with the entire population; the "Tron: Legacy" movie was considerably more discussed on Twitter than the two movies that beat it in the US Christmas Box Office [31]. Facebook is also making an impact at the box office, with "The Social Network" (or "The Facebook Movie" as it is more known by online), a film about the founding and starting of the company, taking $22 million in its opening weekend in the US and grossing nearly $100 million in 2010 [132]. The movie also looks set for an Oscar following 4 awards in the NBRs [86]. The "Facebook movie" goes to show how the social network is becoming as large a part of ordinary people's lives

Perhaps the most influential leverage of the Twitter marketing machine in late 2010 was by American comedian Conan O'Brien. When his evening comedy show in the US was moved to midnight, he quit and leveraged the power of social networking – especially Twitter and Reddit – to build a huge online following. On the back of this resurgent online fame he went on a sold-out comedy tour of the US. With viral hit after viral hit in his marketing campaigns, he eventually signed for US TV network TBS for a new comedy slot earlier in the evening [36] [37] [38] [39]. In a similar way to the Facebook movie, the Twitter and Reddit communities are also having significant impacts on popular culture.

The Greater Manchester Police used Twitter to publicise its often unreported daily activities by tweeting a 140-character outline of each 999 call it received during a 24 hour period [61]. The campaign worked, allowing the force to significantly raise public awareness of its day-to-day activities due to the quick news spreading capabilities of Twitter and large reach available to the campaign. Following Barack Obama's surge to the US Presidency in 2008, with great support from social networking and online users, other US politicians are

getting in on the act in order to promote their activities and campaigns. Late in 2010, the Mayor of Newark used Twitter to coordinate rescue and clearing teams when the city was surprised by a blizzard that dumped 2 feet of snow on the city; he also helped in the cleanup himself [64].

Facebook, due to its large user footprint, is also a great force in general society. Police in the UK have warned against exposing too much location information on Facebook, as there have been a significant number of burglaries targeted against premisis known to be vacant for family vacations and the like after they are broadcast on Facebook [83]. The social network has also been used by the Israeli Army to identify women who claim they are Orthodox Jews in order to try and get out of the 2 years mandatory military service they are required to perform after age 18; by examining their profiles they can determine if they are lying by breaking rules of Orthodox Jews. Over 1000 have already been caught lying through this method [82]. Facebook has also been used as a protest mechanism on many occasions by offline organisations wishing to make their point known; in the more recent of these, an online group took over the Facebook page for DKNY to protest against its use of animal fur [87].

Twitter's data can also be leveraged by academic researchers for many activities, including sociological studies aimed at examining the effect of Twitter on the population and community [68]. Facebook has also recently implemented automated face detection and recognition in its Photos service [84], following research in the academic community along similar lines [133].

An unusual ability of the Twitter community is to make seemingly mundane daily occurrences worldwide phenomena. Following the online popularity of the Double Rainbow Meme during mid-2010 (see [33] and [34]) an occurrence of a double rainbow over Los Angeles in December flooded Twitter with related quips [35].

Twitter's influence is truly global, and affects events outside the tech and entertainment ecosystems [53]. In China, where Twitter is banned (in 2010, 350 million pieces of "harmful information" were blocked by the so-called "Great Firewall" [134]), it was a major vehicle for the news that Chinese human rights activist Liu Ziaobo had been awarded the 2010 Nobel Peace Prize, despite mainstream media being blocked from reporting it [54]. A Chinese woman was sentenced to a year of "re-education through labour" for using the service to send a dissident tweet [55]; and a panic was caused in Indonesia when the account of a disaster management adviser to the President was hacked and a tweet reading "Jakarta tsunami tomorrow" was sent [60]. Facebook is also unavailable in many countries worldwide [77], but several of these bans are not permanent [78]. Facebook CEO and co-founder Mark Zuckerberg was witnessed visiting the headquarters of Chinese search engine Baidu in Beijing, amid rumours he might be planning to make a version of Facebook available in China [85]. Even in countries where the internet is tightly controlled, for example China, it is possible for Twitter, Facebook and other social networks to still become highly influential in the community on certain issues.

The global influence of Twitter can also be highly beneficial. In the aftermath of the major earthquake that devistated Haiti in January 2010, Twitter was used as a communication mechanism following the phone lines going down [57]; Twitter proclaimed the "most influential" tweet of 2010 to be one imploring the US Army to permit a Doctors Without Borders plane to land in Haiti to deliver much-needed aid [67]. It was also used as a major fundraising vehicle by users in aid of the earthquake survivors all over the rest of the world

[56] – yet more examples of the rapid and widespread responses possible through the use of social networking. Vast numbers of tweets of support were sent via Twitter during the rescue of the 33 Chilean miners trapped following a collapse from all over the world [58].

But Twitter is not the only online community to exercise its collective will for effects in society both online and offline. The community of Reddit, a link sharing site similar to Digg, have done both recently. Initially, when Microsoft came to them asking for feedback on their Hotmail e-mail product, they got told exactly what the highly technically skilled Reddit users thought of their product: giving the Hotmail team plenty of reasons why they would never use the service [127]. In terms of offline action, a group called the "Open Source Democracy Foundation" was formed of users of the "Politics subreddit", a sub-section of the main Reddit website focused on sharing and discussing policital news articles and issues. It has recently spoken out against proposed "net neurality" laws in the US, which threaten to affect the quality of access to various websites based on fees on a per-site basis [126].

Despite its many advantages, Twitter can also cause significant legal issues if not used with care. Unless the default settings are changed, all tweets a user sends are instantly available for anybody to see, and are distributed to third parties within seconds – there's limits to what you can get away with tweeting [44]; there are many cases where Twitter users are being sued for tweets they have posted [49]. One of the more famous cases in the UK is that of Paul Chambers, a Twitter user who tweeted a joke about blowing up Robin Hood Airport if it was closed due to bad weather when he was trying to get home to his fiancée; he was convicted of sending a menacing electronic communication [50] [51] [52]. A storm erupted on Twitter when a Google employee accused a Twitter employee of sexual assault at a post-event party, resulting in an extremely public discussion [45] [47]. However, in the UK at least, the Lord Chief Justice has permitted tweeting in court – a practice used to spread news quickly during the hearing of Wikileaks' founder Julian Assange [43].

Facebook has run into legal issues of its own. It was sued by a co-founder who left the company when it was still young resulting in a settlement worth approximately $1.1 billion in Facebook shares [88]. It is also rumoured to be in the closing stages of trademarking the term 'face' in the context of "online sites and services used to exchange messages" to try and eradicate knock-off and spoof versions of the service [89].

Privacy and data access is regularly a major discussion point with Facebook. It has been accused of several privacy breaches in the past [79], but towards the end of 2010 it introduced some new tools and features aimed at improving privacy and sharing capabilities on the site. The service's new Groups implementation allows for users to organise and communicate with only limited sets of their friends; this provides them with a mechanism of broadcasting to just a limited (and closed) group of friends rather than to their entire social graph [80]. Facebook management also announced a set of security features aimed at keeping accounts safe, including one time passwords sent by SMS, remote Facebook signout if you leave yourself logged in on a computer you are no longer sitting at, and enhanced security information to better protect accounts from hacking [81]. Facebook and Google clashed when Google claimed that Facebook took its users into a "data dead end"; while Facebook gave numerous methods of importing contacts into the service, Google claimed, there was no standard way of exporting contacts again from the social network. As a result, Google disabled the ability for Facebook to import Gmail contacts into the service [90]. A Facebook application appeared to help users wishing to do so [91], but Facebook removed the option from their website [92]. When Facebook found an unofficial workaround to perform the export, Google displayed prominent warnings about the social network on the tool [93].

Eventually Facebook agreed that new "@facebook.com" e-mail addresses could be exported from the site [94] and the parties settled; the functionality was restored to normal, users once again able to import their Gmail contacts into Facebook [93]. This all goes to show that even though users are only accessing virtual worlds stored in computers hundreds of miles away, there can be real-world implications and effects on the way companies work together.

2. *Online Communities*

The Wikileaks saga that unfolded at the end of 2010 provided many insights into online communities, how they are orgainsed and structured, and how they communicate. Hours prior to the first release of classified US Embassy cables in December, a so-called "distributed denial-of-service attack" ("DDoS" – Appendix 2 describes such an attack) made the Wikileaks website unavailable [71]. A single hacker later clamed responsibility for the attack [97], and another attack took the website out 2 days later [98]. The attacks were consuming 4 gigabits and 10 gigabits of data per second respectively, a significant volume of data showing the attacks had significant numbers of machines behind them. In the subsequent days, Wikileaks was made unavailable at various stages; initially it was taken offline because its DNS provider had revoked its domain name, citing incessant denial of service attacks [105]. It was then again temporarily unavailable as it was hosted on Amazon's "Amazon Web Services" (AWS) product; when Amazon were made aware of this, they removed the site's hosting citing that it broke AWS' Terms of Service [106]. However, it seemed huge numbers of people in the internet community rallied to Wikileaks' aid, coordinated by the organisation's Twitter account, and soon hundreds of mirrors of the site were available in addition to the site itself, which was relocated to Switzerland [107]. In addition to its hosting problems, banks and online payment services scrambled to block payments and donations to Wikileaks, attempting to cut off its funding. These services included Paypal, Visa, MasterCard, the Swiss bank at which Julian Assange's account was held, and Bank of America [108] [109]. In response, an underground online group that call themselves "Anonymous" began launching DDoS attacks against online services that acted against Wikileaks. The loosely-knit group of online "hactivists" that comprise Anonymous are coordinated by an underground IRC (Internet Relay Chat) network and emerged from the users of an online bulletin board called "4chan". Initial attacks were leveled at Visa, PayPal, and PostFinance's websites, making each of them unavailable for varying periods. Subsequent attacks targeted Amazon.com, fax machines of the companies, and websites of the Zimbabwean government in "Operation Payback", as the group dubbed its offensive [99] [100] [101] [102] [103] [104]. Following the series of attacks spread over several weeks, there were raids by the FBI in the US to seize computer equipment [111]; but eventually "Operation Payback" changed tack dramatically. The Anonymous organisation took the highly unusual step of putting out a press release (unheard of in communites such as that one, with a loose coordination between a group of people often united by emotion rather than a particular sentiment on a topic) which indicated they were to embark on an "education" phase to teach the general public [112] [113] [114]. Meanwhile, the actions of Anonymous were threatening other online communities; Facebook took down the "Operation Payback" Facebook page, and Twitter had to publically defend its "Trending Topics" algorithm when "#wikileaks" was not displayed as a trend despite thousands of tweets every minute containing the hashtag [96] [110]. The Wikileaks and "Operation Payback" incident is one example of the sheer resilience of online communities when faced with difficulties and others acting against them. It also shows how real communities can negatively affect online communities (for example by making them unavailable by removing hosting, DNS or other requirements to a website), and how online communities can also have a strongly negative

effect on people that depend on online services such as credit card processing (by making them unavailable).

When a large community online is compromised, it can have frightening results. Gawker Media, the owner of a network of popular blogs, had its internal systems compromised and over 1 million entries from its users database were stolen. These entries contained e-mail addresses and a hash of the associated password for an account that could comment on Gawker blogs; unfortunately the hashing algorithm used to generate the password hashes was out of date and no salt was used, causing the hash to be extremely weak [115]. Hackers got hold of the database and were able to extract thousands of passwords from the entries [116]. Because many users used the same e-mail address and password combination across multiple websites [117], the effect was soon felt across sites on the web: Twitter was inundated by spam messages that spread viruses to users visiting the links [72].

Online communities are often of vital importance to many companies in the online space, who rely on the devotion of their users and their continued sales in order to keep the company running. When Yahoo! bought social bookmarking service Delicious in 2008, its loyal fans stayed on board, and kept Delicious relevant despite being relatively out-innovated in the social sharing space. When a slide from an internal Yahoo! meeting leaked labelling Delicious as in its "sunset" phase late in 2010 [118], the service's fans were outraged. While Yahoo! failed to immediately find a buyer [120], competing startups in the same space as Delicious profited, with users jumping ship to services such as pinboard.in, which saw a traffic spike of over 100% [121].

Meanwhile, soon after Skype topped a new record with over 25 million users simultaneously online on the Voice over IP (VoIP) service [122], it relied on all of their loyalty when a software bug in its Windows client brought most of the peer-to-peer network that powers the service offline for 24 hours [123]; users were no longer able to connect to Skype at all. Once the service was fully operational, Skype's CIO posted a candid blog post explaining the cause of the problem in detail, and a promise that all paying Skype users would be eligible for a $1.00 voucher towards Skype calls [124]; it was these actions that brought many users back to the service despite the downtime. Skype also goes to show that an online community can come under threat from external sources: the service's users in China face being cut off after the Chinese government announced it intends to ban all VoIP services other than those run by the state-owned China Unicom and China Telecom [125].

Online communities are starting to spring up about all kinds of topics, and blending in to existing social culture both in the technology and non-tech scenes. It has already been discussed how much of an impact social networking is having on marketing strategies [73]; social sharing and discussion features are becoming part of all kinds of other media, including video (where YouTube had 700 billion video views in 2010 [129], and recently counts successes including starting the career of Justin Bieber [135]) and now books. Amazon have launched social "lending" capabilities for e-books on their Kindle device, allowing book loans to happen in the virtual world instead of physical [128]. However, it is not all good news. As Twitter, Facebook, YouTube and other sites experience tremendous growth rates, former successes such as Myspace are now threatened. With its community dwindling in size and bosses at its parent company News Corp. demanding improved revenues, there are rumours that half of the company's 1,100 employees may have to be laid off [130].

5. Summary

Social networks are becoming increasingly popular, with larger numbers of users and increasing influence over the general public. For the first time a social network has taken the number 1 spot in the list of most visited websites in the US in a year (Facebook in 2010), and social networks are reporting huge usage figures and growth rates. It can no longer be in doubt that the services provided by and the content shared on these websites has a significant impact on the wider social community.

Social networking is influencing all kinds of online and offline communities, and reaching far outside its original uses. Political issues are shared, discussed, defended and influenced by social network activity and community activists. Social networks are used to predict country-wide or global trends; re-launch and start careers; and make vast amounts of money. Due to the staggering reach achieved by social networks, "offline" or "real-world" businesses are now looking to invest significant marketing budgets in them to promote their products or services. When a formerly popular social network dwindles in size, jobs and livelihoods are put at risk. In 2010, the first hints of an online "cyberwar" between communities and corporations were seen; online "hactivists" are capable of disrupting services used by the wider community in protest, but conversely there are mechanisms with which online communities, websites and services can be legally challenged and forced offline by those they attack.

As online communities grow in size, their dependency on the online services that support them increase. If those services are suddenly made unavailable – through technical fault, censorship, or some other reason – people can suddenly become stranded in an online ocean with no means of communication. Loyal users are sometimes all that underpin a company, turning it from a small business into a global success. If these vital communities are somehow angered, it is easy for them to switch their alleigance and cripple the company.

Even in communities and countries with reduced or limited internet access, social networking is having a significant impact. The rise of mobile access to social services makes them effective in environments with limited connectivity; if the desire is strong enough, all connection restrictions can be circumvented. The ability for anybody to post any content they want, the defining feature of the recent growth of the web, has removed publishing barriers making billions of people heard around the world.

But online activites can also get you in trouble. Posting publically on social networks can get you in just as much bother with the law as publishing threats or lies in more traditional media. Social networks can very easily become public court rooms as the public judges and shares its opinion on often complex and sensitive issues.

Privacy and security concerns continue to hang like a storm cloud over online services, with popular social networks being accused of privacy breaches and insecure websites being comprimised and user's personal data they had entrusted with the service stolen.

2010 was the year that "social" really stole the show online. It now affects all kinds of businesses and communities – online and offline – and is becoming such a major market force that those not engaging or becoming present online risk being left behind.

6. Future Issues

It is clear that social networking and online communities are here to stay for the long term. Within the first 2 days of 2011 it emerged Facebook had taken half a billion dollars in funding from Goldman Sachs and a Russian investor, taking the company to a new valuation height of $50 billion [136], making it bigger than News Corp., eBay, TimeWarner and Yahoo! [137].

Two of the largest issues facing social networks and online communities going forwards are legal and privacy related. Even in January 2011, Facebook announced that it had produced a change to its Terms of Service for US State Agencies following months of consultation with lawyers and judges which would permit such organisations to maintain a presence on the social network and still operate within state law and constitutions [138]. The move follows a similar change in 2010 for US Federal agencies, which resulted in over 50 such agencies creating presences on Facebook. The social network is also focussing on providing more privacy features for its users, which will hopefully improve security on the site [80].

Also in January 2011, Twitter released that it had been subpoenaed by the US Government to release information including all know mailing and billing information, IP addresses, connection records and session times, e-mail addresses and banking and credit card records for users associated with Wikileaks, including Jacob Appelbaum, Rop Gonggrijp and Julian Assange [139]. The order was initially "sealed", meaning that Twitter would be required to hand over the information without notifying the users; it was only after legal action by Twitter that the users were allowed to be notified, and had 10 days to challenge the subpoena [140]. Just these examples show that as the popularity of these online services continue to increase, they will become implicated in increasing numbers of privacy and legal issues, and will have to have strong policies in place in order to deal with those.

Another increasing trend that will be observed in the future is the issue of accessibility of social networks. Questions have been raised over how people with visual or other physical impairments can continue to use the services as they become increasingly complex, and how it will affect them socially if they cannot use the services [141]. Services that are very popular in certain cultures may struggle to expand into other cultures around the world without localisation changes [24] [142]. It will also be increasingly important for social networks and online services facilitating communities to maintain availability, as their increasing reach will have larger impacts if they become unavailable for any reason [71] [123]. It is also predicted that the banning of particular services in certain countries will continue to impact their growth. If the Skype ban in China is persisted, their large community there will be forced to find other services [125]. If Mark Zuckerberg is successful in getting the Chinese ban on Facebook lifted, it will be an enormous opportunity for the company to expand into the world's largest population, and would undoubtedly bring social benefits to the company [85].

A trend that has started in 2010 is towards more private, closer-knit social networks for targeting smaller online communities. While Facebook has massive reach, it is not necessarily a suitable platform for sharing photos between close friends and family, and orgainsing events with those close to you. Several high-impact startups emerged in this space in 2010, and it looks as if they have sufficient potential to carry them to success in the future. Instagram, a niche photo uploading and sharing tool for iPhone, has surged past 1 million users in its first 10 weeks of release [143] and processes three uploads per second [144].

Meanwhile Path, a photo-sharing service that limits your sharing to 50 select friends and family, has diversified into 10 second video sharing [145]. Finally, another startup founded by former Google engineers is making waves as it grows. Beluga is an application for iPhone, Android and the web that allows communication in "Pods" of unlimited numbers of people; it was started as the founders wanted an easy way to communicate with groups of friends and family in order to organise events and share news [146] [147] [148]. With applications such as Beluga, Instagram and Path beginning to make a significant impact in the tech world, it looks like the future will include them growing to include more users and to become part of mainstream societies just like the mainstream social networks did during 2010.

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8. Appendices

1. TechCrunch Reference Article

    This is a copy of the cached version of the TechCrunch article entitled "Googler Accuses Twitter Engineer Of Sexual Assault, Trial By Twitter Commences", originally published on TechCrunch.com on 05/11/2010. It has since been removed, but this cache was retrieved from Google Reader. The blog post to which the article refers is available in [45].

<u>Googler Accuses Twitter Engineer Of Sexual Assault, Trial By Twitter Commences</u>

via TechCrunch by Alexia Tsotsis on 11/5/10

Google technical writer Noirin Shirley wrote a post on her personal blog earlier this evening entitled "A hell of a time," purportedly detailing her experiences last night at ApacheCon in Atlanta. Shirley recounts a drunken post-conference party she organized in her hotel room and describes a rather disturbing (if true) interaction with Twitter engineer Florian Leibert:

"He brought me in to the snug, and sat up on a stool. He grabbed me, pulled me in to him, and kissed me. I tried to push him off, and told him I wasn't interested (I may have been less eloquent, but I don't think I was less clear). He responded by jamming his hand into my underwear and fumbling."

With such incendiary subject matter it is no surprise that the post rose to the top of Hacker News in a matter of hours. What's even more interesting is that the accusations have reverberated on Quora and Twitter with people @ replying both Leibert and Shirley with Shirley's post.

"It's not the first time something like this has happened to me, at all. It's not the first time it's happened to me at a tech conference. But it is the first time I've spoken out about it in this way, because I'm tired of the sense that some idiot can ruin my day and never have to answer for it."

It is notable that the allegations of wrongdoing now have a realtime venue to play out, primarily because the players in the drama have tech community prominence and are both on Twitter. Neither Leibert or Shirley have tweeted anything since Shirley sent out her blog post about the incident.

I have contacted Leibert for his side of the story and will update this post when he responds. Shirley makes no indication she has filed any formal complaint.

2. *What is a distributed denial-of-service attack (DDoS)?*

A distributed denial-of-service attack is a coordinated assault on a website by attackers at multiple, often hundreds or thousands of different internet addresses. The attack makes the target website unavailable by flooding the website with requests, either forcing the servers to be unavailable due to overload or overloading the network connections of the target website. The attack is extremely effective if sufficient attack sources are available as it is then near impossible to block the thousands of attack sources in a reasonable time period. See [149] for more information.

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