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Abstract

Facebook was launched in 2004, YouTube in 2005, and Twitter in 2006. They are thus very new service platforms but they already have millions of users and their valuation is counted in billions of US$. This is an extraordinary development, which one will not find in any other line of business, and it illustrate the power of network effects, where the utility of the individual users depends on the presence and usage of the network by other users. The cases described in the present paper are clearly examples of web 2.0 services, where the services provided by the networks are dependent upon content created by the users.

Business models in social networking

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1. Introduction

The aim of this paper is to present a description of the business models of three social networks, YouTube, Facebook and Twitter, including a description of how they are, or strive at, making money. Making money is certainly not the aim of all social activities and some social networks have, indeed, started without any commercial ambitions. At a point of time, however, if a social network grows beyond its immediate social setting, the issue will be raised how money is to be made – if not for other purposes then for covering the costs of maintaining and developing the network.

As mentioned in the Twitter case (section 4), one of the co-founders of Twitter, Ewan Williams, has been cited for saying that "we're not worried about monetization, we're just worried about making a fantastic product" (Miller, 2009). This resembles statements one could find before the so-called dot-com crash in 2000-2001, which caused business model analysts and developers to give greater emphasis to how money is actually made instead of just 'counting eyeballs'. There is, however, an ongoing discussion on how social networks are and will be making money. One only has to 'google' the words 'social networks' together with 'making money' and a range of websites will pop up.

An important difference between the pre-dotcom period and now is that the web in the first-mentioned period, to a large extent, was dominated by one-way services, while web 2.0 services - as first Darcy DiNucci (1999) and later Tim O'Reilly (2005) have termed them - involving user participation, have presently grown in importance. This will have an influence on the role of attracting users without having a clear business model to start with. Network effects play a far greater role in web 2.0 services than in the first generation of web-based services.

The services that this paper is concerned with are clearly web 2.0 services - according to the O'Reilly definition (2005). Two of them, Facebook and Twitter, are what can be characterized as social networks. The last one, YouTube, is a video-sharing site, but includes social networking applications. Other kinds of web 2.0 services include blogs, wikis, folksonomies, etc.

The business model concept used in this paper builds on the basic structure of the business model ontology developed by Dutch and Belgian researchers, presented, for instance, in one of its early versions in a paper by Edward Faber et al. (2003). This conception differentiates between four design elements: Service design, organization design, technology design, and financial design. The

sections on the three cases in the present paper use these four design elements as the structure for the description of the cases. Emphasis in the paper is, however, on the financial aspects and primarily on the revenue side. How is money actually made: Which are the potential sources of income?

An important premise is that it is considered as virtually impossible to charge the individual users. This, of course, depends on the categories of services and of users. Some dating services, for example, are based on end-user payment. Furthermore, if dealing with business users and social networks involving business users, there may be greater possibilities for charging a fee for participating in the network. However, if dealing with residential users, there is a very low - if any at all - willingness to pay for such communication and interaction services on the Internet. Other modes of income have to be sought.

As we are dealing with platforms, there are, indeed, other sources of income. The economic characteristics of platforms are that they coordinate the demands of distinct groups of customers who are dependent on each other (Hagiu, 2006). All words are important here: Platforms *coordinate* the *demands* of *distinct groups* of *customers* who are *dependent on each other*. There are in other words indirect network effects between the different groups of users. Dating services are a core example. However, the three cases that this paper is concerned with are also examples of such platforms.

YouTube is a video-sharing site where the residential users can hardly be characterized as distinct groups. But advertisers are distinctly another group and so are application developers. In the case of Facebook, the great mass of users must likewise, in an economic sense, be understood as one group. However, application providers are another group. The application developers which are verified by Facebook pay a fee to Facebook. Furthermore, advertisements are part of Facebook's business model. With respect to the Twitter case, application providers are also the second potential group of users.

If not fully developed yet, a clear development perspective for the social networks in question is to become two-sided or multi-sided markets/platforms. Other sources of money are, however, also possible. As at yet, the most important source of funding has hitherto been venture capitalists. They have put money into these operations based on the expectation that they eventually will be making money. This has functioned well - especially in a period of economic upturn. It may, however, become stricter in the coming years because of the present economic crisis.

An additional source of income will come from selling information on the users to advertisers. There are clearly privacy issues involved. However, information on users and their usage patterns can be made anonymous and still have great value to advertisers. There are thus different possibilities, and in the following three sections the actual and potential sources of income will be described together with a broader presentation of their business models in accordance to the business ontology presented.

2. YouTube

YouTube is an Internet based public video-sharing service, where the end-users upload and share video clips. On YouTube people can experience varying degrees of engagement: One can chose only to view the available content, or also to share videos with others and even to develop social relationships

YouTube was created in mid-February 2005 by three former PayPal employees: Steve Chen, Chad Hurley and Jawed Karim, and in October 2006 YouTube was acquired by Google Inc for US$ 1.65 billion[1].

Google has implemented a sophisticated advertising scheme and revenue sharing mechanisms to run the YouTube business. These are discussed in the following.

Technical design

YouTube video playback technology is based on Adobe Flash Player and uses the Sorenson Spark H.263 video codec with pixel dimensions of 320 by 240. This technology allows YouTube to display videos with quality comparable to more established video playback technologies (i.e., Windows Media Player, QuickTime and RealPlayer). YouTube officially accepts uploaded videos in .WMV, .AVI, .MOV and .MPG formats, which are converted into .FLV (Adobe Flash Video) (Cheng et al., 2008)

Each YouTube video is accompanied by an HTML markup for embedding it in another page, unless the uploader chooses to disable this feature. This simple cut-and-paste feature is especially popular with users of social networking sites, and is also a key to the success of YouTube. (Cheng et al., 2008)

The video applications prior to YouTube were mainly based on peer-to-peer file sharing technology. YouTube chose the client-server model, which has been characterized as a step back in the development (Hoegg et al., 2008). The client-server architecture necessities huge amounts of investments in server parks and broadband links in a centralistic architecture, which has been considered being sub-optimal for video/audio sharing compared to peer-to-peer architectures.

In the beginning, the huge investment costs behind the service raised the question of how YouTube could get a return on the investments. In particular, this became important as the service became highly popular with huge amounts of upload of video content and because the business model was not entirely clear. However, the revenue model based on advertising and partner programs seem to be valid components of YouTube's business design.

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[1] http://www.ecommerce-journal.com

Service design

YouTube began as a video-sharing platform, but it also offers users a personal profile page - which YouTube calls a 'channel page'. This enables people to create friends and to develop social relationships. A channel page is the YouTube equivalent of what other social networking sites call 'profile' pages and includes personal information as well as a list of videos made by the participant, their subscribers, favorite videos, and subscriptions to other YouTube participants. (Lange, 2007)

YouTube represents a service which is different from other video services and the traditional VoD systems. Many other video services and VoD systems prior to YouTube were driven by professional content. The quality and popularity of this content can often be controlled and predicted, while in YouTube the amount and quality of content are unpredictable and mechanisms like 'rating' are needed to enable users to get familiar with new content. When comparing traditional VoD services and YouTube, two main issues are mentioned in Zink et al. (2008): 1) YouTube video contents are uploaded by anyone with access to the network. The content and quality of these video clips vary vastly. As a consequence, predicting how many new videos will be uploaded and their popularity within the YouTube community is very hard. 2) The manner in which content spreads from these two systems to the public is also different. In the VoD system, either the viewers expect regular updates on the content (in the case of news or TV series) or the content provider can announce new content (e.g., the upcoming of the latest block buster). In the YouTube system, it is often the case that a video clip has become extremely popular after viewers became aware of the clip and told their friends about it, discussed it in blogs, and put embedded links to the clip on their own web pages.

An important barrier for the development of the service has been the copyright issues, where people have simply used the platform for uploading copyrighted content without permission of the right holders. This has resulted in YouTube putting an upper limit of 10 minutes on video content, i.e., video content greater than 10 minutes is not allowed on regular the YouTube platform and can only be accessed as a premium service.

The participation and engagement of the users range from users viewing programs occasionally to users who are very active in uploading, commenting, rating and developing social relationships in the YouTube sphere. In a user study of YouTube users in (Lange, 2007) the users are divided into the following 5 categories:

1. Former participants, who no longer post videos but may maintain an account, watch videos on the site, and occasionally post a comment.

2. Casual users, who typically do not have an account, tend to view videos when they wish to search for something specific, when they surf the site, or when someone prompts them with a link to a particular video.

3. Active participants, who have an account and usually upload videos or at least participate by leaving comments on other people's video or channel pages.

4. YouTubers or 'Tubers', who have a more intense engagement with YouTube in terms of the amount and type of their participation. They are often on the site daily and certainly weekly, sometimes for an hour or more per session. Many, although not all YouTubers, promote their work both within and outside YouTube. They upload videos and closely attend to and participate in YouTube debates and discussions.

5. YouTube celebrities, who share qualities similar to those of YouTubers. However, they are also quite well known both within and often outside of the site. YouTube celebrities influence the discourse, goals, and activities on YouTube through their videos, comments, bulletins, and other forms of interaction.

All categories of users generate advertising revenues, while as discussed below, category 4 and 5 can also get shares in the generated revenue by going into partnership programs with YouTube.

Organizational design

YouTube is built on user generated content with the end-users acting as producers and consumers of the content. YouTube does not have any creative and content producing resources and their success lies in the provision of an easy to use, global platform, where the ordinary users and professionals upload and share videos with each other.

To create incentives for producers of both user generated content and professional content, YouTube has developed a partnership program, where the content generators get a share of the generated revenue. In the beginning, the content generators should contact YouTube to become part of the program, but in the past years YouTube has chosen a more proactive strategy, where they contact the popular content generators in order to bring them into the partnership program.

This partnership program may provide the solution to the copyright problem as it generates revenue to content providers, and professional content rights holders like Hollywood may see the You Tube platform as an opportunity for distribution of their content. It is not unrealistic that 'pay for content' can also be deployed for professional content as a supplementary revenue model for YouTube alongside with advertising

Financial design

The revenue model is so far based on advertisements. A number of different ways of advertisements are used in YouTube:

- In-video graphical and text advertisements: Around 15 seconds into a video, an 80% transparent overlay appears in the bottom 20% of the video. If ignored, it disappears after 10 seconds; if clicked, it plays the video ad over the top of the existing clip, then resumes your original clip when complete[2].

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[2] http://mashable.com

- Post-roll advertising: if you don't click on an overlay ad when it shows up in a clip you're watching, the video ad it would have played rolls automatically at the end of your video[3].

- Pre-roll advertising: Pre-roll ads are short video clips that you must watch before the video.

- Regular banners.

- Sponsored advertising: Sponsored video spots that works like sponsored advertising on Google: An advertiser buys a position for specific key words and when somebody types these key words the advertiser's video pops up above others with yellow background (again like Google's search).

Fred Wilson the principal of 'Union Square Ventures' has on http://www.avc.com developed a simple model to calculate the YouTube's revenue model.

The model is very simplistic and the values used are not necessarily correct. However, it shows that because of the huge amounts of the viewers, even when advertisers are charged with a price as low as 15 US$ per 1,000 views, and even if 65% of this goes to content providers engaged in the partnership program, there will be more than enough left to cover You Tube's operating costs.

3. Facebook

Introduction

Facebook was launched by a student, Mark Zuckerberg, at Harvard in February 2004. At the beginning, Facebook was just a student directory, the goal of which was to provide an important information and communication services to a pre-existing offline community. In the early days of Facebook, only users who could verify they had an .edu e-mail address for the college they attended could register. This restriction was made to ensure trust between the offline community and the online service created. Since then, Facebook has acquired over 300 million users and is the fourth largest site in the world after Google, Microsoft and Yahoo sites.

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[3] http://newteevee.com/2008/10/01/youtube-rolls-out-post-roll-video-ads/

Table 1: Worldwide unique visitors (June 2009)

	Worldwide unique visitors, June 2009
Google sites	844 million
Microsoft sites	691 million
Yahoo sites	581 million
Facebook sites	**340 million**

*Source: comScore, June 2009*

Target group

Facebook provides a social network for all regular PC Internet users and recently also mobile users. Facebook's statistics page offers interesting information on user profiles and engagement. According to the statistics, more than 40 million users update their status every day, and they spend more than 6 billion minutes on Facebook every day. The average user has 130 friends on the site. The fastest growing segment is made up of people above 35 years of age. More than 70% of Facebook's users are outside the United States[4].

Since Facebook has been made available as a mobile service, more than 65 million active users access Facebook through their mobile devices. This kind of growth has important implications for infrastructure and for advertisement companies.

The graph below shows that Facebook continues to grow in an extremely rapid pace. In just 14 months, Facebook has grown from 100 million to 300 million users.

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[4] www.facebook.com

Figure 1: Facebook-users growth
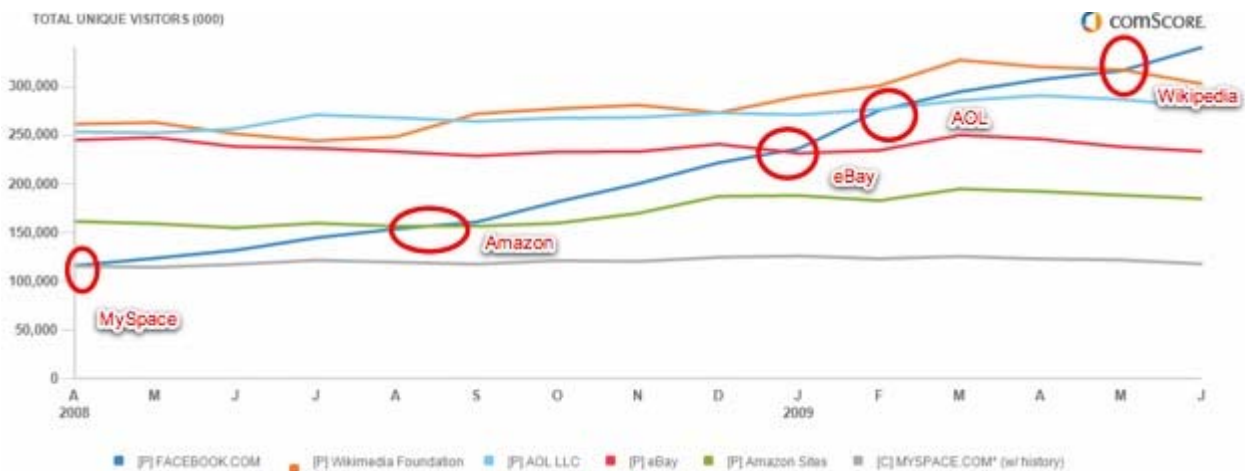
Source: Erick Schonfeld, Facebook Is Now the Fourth Largest Site in the World, August 4, 2009

Technology design

Facebook Platform is a standards-based web service with methods for accessing and contributing to Facebook data[5]. A key feature which contributes to Facebook's success is its application platform, which enables the development of third-party social-networking applications. Facebook has opened up its core functions to all outside developers on May 24 2007 and already in November 2007, seven thousand applications had been developed on the Facebook Platform, with another hundred created every day. By July 2008, the number of applications had grown to 33,000, and the number of registered developers had exceeded 400,000[6]. This growth has continued and in November 2009 the number of applications released by third party developers was as high as 350,000. Third party developers include: Microsoft, Amazon, Slide, RockYou, Box.net, Red Bull, Washington Post, Project Agape, Prosper, Snapvine, iLike, PicksPal, Digg, Plum and others. More than 250 applications have more than one million monthly active users[7].

In order to make the Facebook Platform better for both developers and users, Facebook has introduced new guidelines that have changed how applications are ranked in the application directory. Before, the focus was on total number of users, but going forward, user engagement

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[5] Facebook Platform: http://developers.facebook.com/

[6] 'Facebook Expands Power of Platform Across the Web and Around the World'. Facebook, 2008-07-23. http://www.facebook.com/press/releases.php?p=48242

[7] www.facebook.com

becomes central. This change has helped drive the growth and distribution of applications which focus on user engagement and utility.

Service design

Facebook services focus on building online communities that allows people to connect and communicate with friends. For users, Facebook's core service is completely free and ad-supported. Users can upload pictures, create their profile and be friends with other users completely for free. Facebook provides the user with a choice of who can view their profile. This prevents unauthorized users from accessing their information.

Facebook provides a variety of ways for users to interact such as e-mail and instant messaging services. In addition to this, Facebook provides additional features such as the ability to create groups of users who share common interests, and facilitation of open or closed discussion forums. It is also possible to upload videos and other content. This can be sent as messages or shared by the use of the notes application.

One of Facebook's most popular features has been the ability to upload photos. Users can upload an unlimited number of photos from their cell phones or through the Java-based web interface, the only restriction being a 200-photos-per-album limit. Facebook also provides the feature to share the photos with a simple web link or send them via AIM or by e-mail. Users can also order prints online through a simple integrated interface. Users can, furthermore, set specific privacy settings for each of their albums, making them visible only to certain friends. Another important feature is the Facebook 'events' application, which can be used to organize events. This feature has been extremely successful when it comes to organizing parties. Along with organizing and joining events, users can also invite and recommend others to an event.

Facebook is, moreover, providing a few mobile options for its users. One of them is mobile web which is an alternative version of Facebook especially designed for mobile phones. Another option allows users to upload photos and notes from their mobile phones to Facebook. Users can send and receive text messages from Facebook friends. Recently, Facebook has implemented Facebook Connect which is Facebook's own approach to the single sign-on.

Organisational design

The following actors are involved in the Facebook value chain: Facebook, application developers, access providers, handsets vendor, operators and users. Facebook is operated and privately owned by Facebook Inc. Access providers provide Internet and mobile access to Facebook. Users include private users as well as advertising companies.

An important part of the Facebook platform is services provided by application developers, particularly by games developers. The value that Facebook offers them is to tailor their applications for a social networking environment and to make it easy for Facebook users to access various applications, e.g., to find games and then play with friends.

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According to Wireless Week, every handset vendor and operator is trying to get deals with Facebook and other social networks. Handset vendors are important players in the value chain. According to operators, social networking applications are increasingly driving the growth of the mobile Internet audience. Therefore, handset manufacturers and operators are racing to be the first to bring phones with a user interface especially designed for the use of social network services like Facebook[8].

Recently, Facebook and Nokia are in talks about how to embed the social network into Nokia devices, mentioning the possibility of integrating Facebook contacts and activity with the device's phonebook. Even though Facebook already has a mobile site, this partnership would get it installed onto devices at the factory level, giving the community platform a strong foothold in the mobile market.

Finance design

a) Revenue

At the beginning, Facebook's business model was based upon monetizing of the social network that has been built. The total number of users was more important than interaction between a user and a brand. As a result Facebook didn't make enough money from advertising services. Even though more and more advertisers spend their money on web advertising, only few of them had decided to invest in Facebook.

This situation has changed in year 2009. Facebook's management is expecting that revenue will grow from US$ 280-300 million to US$ 550 million in 2009. This implies a growth of 70% in one year. Expected sources of revenue are[9]:

- $125 million from brand ads.
- $150 million from Facebook's ad deal with Microsoft.
- $75 million from direct sales of virtual goods.
- $200 million from self-service ads (mostly from social gaming companies on the platform, e.g., Zynga, but also 'performance advertisers' like online education companies[10]).

Taking into consideration that Facebook has 300 million users in the world, revenue per user is still small. In comparison, Google makes 190 times the revenue of Facebook per page view[11].

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[8] Justin Smith, Facebook: Telecoms' New Best Friend?, February 24th 2009.

[9] Marc Andreessen, Facebook board member, July 2009.

[10] E.g. online education company University of Phoenix, are finding that ads on Facebook can be targeted so precisely that they are getting a clear return on investment. The right sorts of people see the ads, click, and sign up for an online course.

[11] Bhavin Turakhia, Google makes 190x the revenue of facebook per pageview, 24 Aug. 2009.

From the data presented above, one can see that most advertising revenue comes from ad deal with Microsoft (beginning of 2009). Microsoft became the exclusive provider of standard banner advertising on Facebook using Microsoft's digital advertising solutions and the Microsoft® ad Center platform in 2007.

During the second half of 2009, Facebook's revenue has become less dependent on the deal with Microsoft. Facebook started to make money on its new experimental advertising efforts and through sales of third-party brands and real-world goods as branded virtual gifts[12]. So far, companies offering virtual gifts include: Zynga, American Greetings Interactive, GreetBeatz, Somecards and Real Gifts, Sephora, Mars, Incorporated as well as 1-800-Flowers.com., Dell, eBay, Bud Light, Pizza Hut, Target, Dunkin' Donuts, Starbucks. Facebook is also launching a number of branding gifting campaigns, for example, for the Watchmen movie, Terminator Salvation movie, Britney Spears[13] Circus tour, Budweiser, Johnnie Walker.

The largest Facebook app developer Zynga, which is a social gaming company contributes with as much as US$ 50 million per year in ad revenue to Facebook. Zynga sells virtual goods (reward points in Mafia Wars, chips in Poker etc.) to its players for US$ 500,000 a day.

Members of Facebook purchase virtual gifts mostly for self-expression, social status and communication reasons. Approximately five million virtual goods are exchanged on Facebook daily, which means that this rare form of advertising is the form of ads that people like to receive. In comparison to traditional banners, this result is compelling.

According to the Piper Jaffray Report, 'Social Networking Coming of Age', the market for paid virtual goods is estimated at US$ 1.6 billion in 2009 and will be growing to US$ 2.8 billion by 2012.

A new feature implemented in Facebook can increase revenue by allowing advertisers to create, manage and monitor advertisements themselves. Advertiser can target their audience by choosing the preferred option regarding age, sex, location, time of the day as well as by language, place of work, education, status etc.

In addition, Facebook has extended its business opportunities by offering Facebook Ads in 15 currencies. Considering that 70 % of the users are from outside of US, this is important for many investors.

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[12] For those campaigns, advertisers only pay for those gifts that are viewed from within Facebook applications. If someone re-gifts a virtual good or does anything else with it, the advertiser is not charged. Advertisers are currently running campaigns in which millions of gifts are being sent which means the "Cost Per Gift" advertising model is already a multi-million dollar business.

[13]Brands with major licenses are also now turning to the Gift Shop to offer goods as part of their promotional marketing efforts, like, e.g., Britney Spears line of virtual gifts.

It is expected that most revenue (app. 74%[14]) will come from local, location-based ads. Local advertisers have found out that they can bring new customers into their business by targeting people who live nearby.

It is also expected that Facebook will generate significant revenue through payments or credits before the end of 2009. Unfortunately, Facebook has not disclosed exact numbers regarding their prediction of the revenue.

In order to attract larger advertisers, Facebook has partnered with Nielsen[15] to gain its credibility among advertisers. The Nielsen Company will provide information about how web content and online advertising on Facebook will affect consumer behavior. The management expects that this collaboration will help reaching the global consumer market through advertisements on Facebook.

According to a new report from Nielsen, year-over-year estimated online advertising spent on the most popular social network and blogging sites increased 119 percent, from about US$ 49 million in August 2008 to US$ 108 million in August 2009. In 2009, Facebook became the no.1 social networking side advertised on by 10 of the top 13 industries ranked by display ad impressions in US (see table below).

Table 2: Year-over-Year Percent Change in Online Advertising Spend by Industry (US, August 2009)

	Estimated Spend on Top Social Network Sites*		Year-over-Year Percent Growth		Social Networking Site
Industry	**Aug-08**	**Aug-09**	**On Social Network Sites***	**On All Sites**	
Entertainment	$1,097,700	$10,012,800	812%	40%	MySpace
Travel	$473,700	$2,198,200	364%	-11%	**Facebook**
Business to Business	$683,400	$1,941,700	184%	-8%	**Facebook**
Automotive	$1,110,200	$3,085,800	178%	-26%	**Facebook**

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[14] According to a report from Borrell Associates.

[15] The Nielsen Company is a global information and media company with leading market positions in marketing and consumer information, television and other media measurement, online intelligence, mobile measurement, trade shows and business publications. The privately held company is active in more than 100 countries, with headquarters in New York, USA. www.nielsen.com.

Health	$1,131,500	$2,754,900	143%	8%	**Facebook**
Web Media	$11,231,800	$26,855,700	139%	30%	**Facebook**
Software	$526,400	$1,202,500	128%	-29%	**Facebook**
Financial Services	$3,233,900	$6,415,900	98%	-10%	MySpace
Public Services	$6,836,500	$13,203,100	93%	13%	**Facebook**
Telecommunications	$12,449,500	$23,550,300	89%	-1%	**Facebook**
Consumer Goods	$1,913,400	$3,349,200	75%	8%	**Facebook**
Hardware & Electronics	$654,000	$1,022,900	56%	-47%	MySpace
Retail Goods & Services	$8,101,400	$12,556,800	55%	-12%	**Facebook**

Source: Nielsen report, 2009, http://en-us.nielsen.com/

The share of Internet advertising had always been marginally less than advertising spending on local and national TV. This has changed in favour of Internet for the first time in 2009. According to the data presented in the report, all industries increase online ad spend on social networking sites in August 2009[16].

b) Cost

As Facebook continues to add new members and their associated content, it also needs to expand its abilities to serve by investing in infrastructure and staff. Facebook users upload more than 2 billion photos to the site each month and more than 14 million videos[17]. That will of course drive demand for more data centre space and more servers.

More data centre space means more cost for the company. Facebook may spend well over US$ 1 million a month on electricity to power its servers and data centre space[18]. The company has earmarked US$ 100 million to buy 50,000 servers this year and next.

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[16] http://en-us.nielsen.com/main/news/news_releases/2009/september/nielsen_reports_17

[17] Facebook statistics, 2009; http://www.facebook.com/press/info.php?statistics

[18] Rich Miller, Facebook expanding its data centers again, March 30th 2009.

Figure 2: Server loans
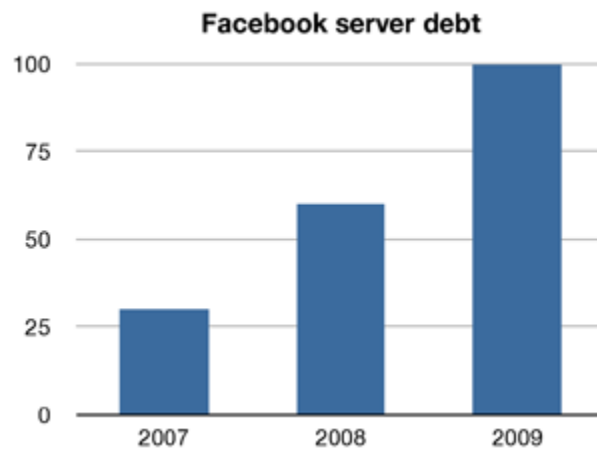
Source: Niall Kennedy, Facebook's growing infrastructure spend, San Francisco, California, United States, March 29, 2009

Facebook tries to solve the problem of high infrastructure cost by taking more control over its own data centres and infrastructure architecture. The company opened up its first data centre in Santa Clara in January 2009, and an international headquarter in Dublin, Ireland. These investments will allow for lowering total operating costs per server.

At the same time, Mark Zuckerberg plans to hire more engineers and increase staff by 50%. Facebook currently has 1,000 employees. People are often the most substantial cost for a company and even though Facebook tries to reduce its cost, the company still plans to employ more staff. With growing numbers of employees, Facebook spends at least another few million per month on payroll.

The question is how much money Facebook will need to invest in the hardware to keep up with growth particularly in requirements for storage. According to various sources, Facebook has been buying one NetApp 3070 storage system per week just to keep up with all the user generated content. At up to US$ 2 million each, that means that they may have spent as much as US$ 30 million only in 2008[19].

c) Investors

The major resources of Facebook are the servers that keep the site running despite the heavy amounts of traffic. The growing audience could not be contained without external funding. Facebook received its first investment of US$ 500,000 in June 2004. Paypal co-founder Peter Thiel, invested US$ 500,000 to buy servers to help support the rapid growth. Investment data is presented in the table below.

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[19] Michael Arrington, Facebook May Be Growing Too Fast. And Hitting The Capital Markets Again, October 31, 2008

Table 3: Facebook investment

DATE	TYPE	CAPITAL AMOUNT	POST-MONEY VALUATION	INVESTORS
09/2004	Seed	0.5M	Unknown	• **Peter Thiel**
05/2005	Series A	12.7M	Unknown	• **Accel Partners**
04/2006	Series B	27.5M	Unknown	• **Greylock,** • **Meritech Capital Partners,** • **Accel Partners**
10/2007	Series C	310M	15000M	• **Microsoft,** • **Oliver Samwer,** • **Alexander Samwer,** • **Ka-Shing Li,** • **Marc Samwer**
03/31/2008	Series C	40M	Unknown	• **Clarium Capital Management,** • **Greylock Partners,** • **Meritech Capital Partners,** • **Accel Partners,** • **Microsoft**
05/2008	Debt	100M	Unknown	• **TriplePoint Capital**
05/26/2009	Series D	200M	10200M	• **Digital Sky Technologies will get preferred shares for it's 200 million**

*Source: Facebook overview, 09,2009*

4. Twitter

Twitter is a social network based on a microblogging platform allowing users to post short messages and read messages from others. Twitter was founded in March 2006 and was introduced as a public service in October same year. Users are heavily represented only in a dozen countries (Krishnamurthy et al., 2008). Twitter is most popular in North America, where 45% of the users are located (Java et al., 2007). In 2008, Twitter introduced a Japanese version. Tokyo, New York, and

San Francisco are the major cities with high adoption rates of users. In the US, the number of unique users have increased from 475,000 in February 2008 to more than 7 million a year later (Nielsen, 2008). In spite of this staggering growth, Twitter is still much less widespread than the most popular US Social network sites Facebook and MySpace.

Technical design

Twitter provides a common platform for sending and receiving messages by the use of a wide range of delivery channels (figure 3). Twitter can be accessed via an Application Programming Interface (API) developed by a third party. It is also possible to import an application to Facebook so that Twitter can be accessed from there. Other access options are instant messaging systems, SMS, or the web interface provided on http://twitter.com.

Figure 3: twitter input and output methods
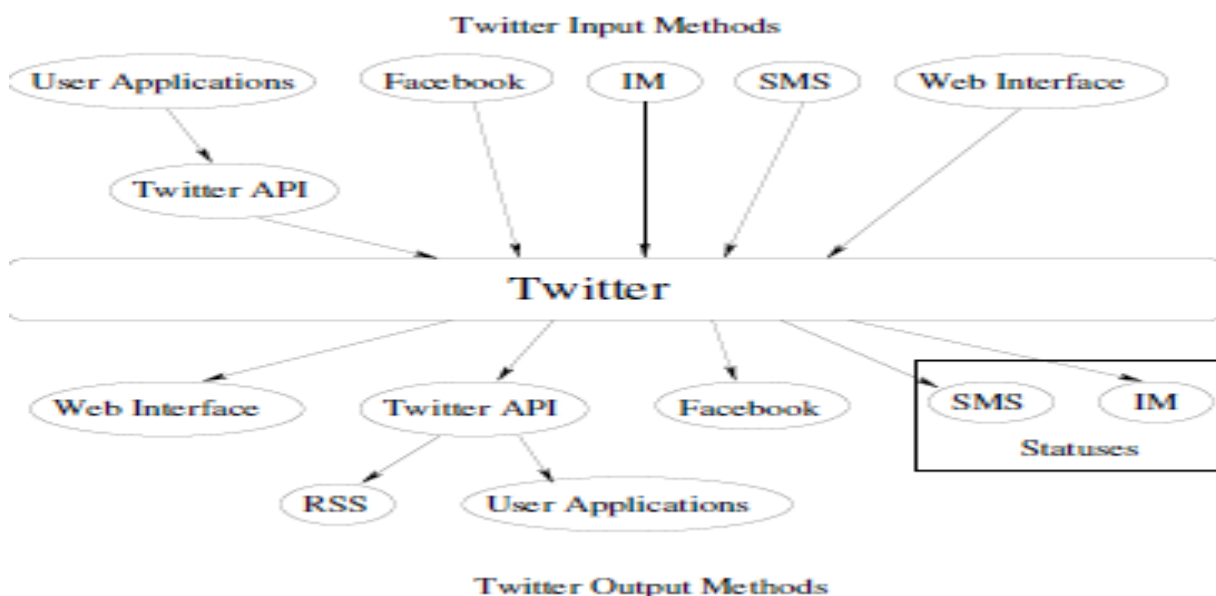
Source: Krishnamurthy, Balachander; Gill, Pilipa & Arlit, Martin (2008) A few Chirps About Twitter. WOSN'08 August 18, 2008, Seattle, Washington, USA.

Service design

The core services offered by Twitter are not very different from those offered on Facebook: Users can create their own homepage describing their profile. They can read and post messages (tweets), and they can send messages directly to another user. Posted messages are sent to all 'followers', i.e. those who have chosen to follow a certain user. The concept of followers is different from the concept of friends used on other social networking sites such as Facebook, Linkedin, and Plaxo. 'Friends' indicates a symmetric relationship, while you do not need to follow your followers on Twitter and vice versa. Furthermore, you can choose to follow any user without his prior

acceptance. This implies that some users have many more followers than they follow. For instance Larry King has 1.3 million followers and follows only 81. Another important feature is that it is possible to do keyword search in the entire population of tweets. This enables users to see if anyone has posted something on a particular subject.

As other social networks, Twitter can be accessed on the Internet, but Twitter is deliberately designed as a mobile service. The formatting requirements for users' homepages are made in such a way that they are suitable for access via a mobile phone, and tweets are limited to 140 characters, so that they can be distributed via SMS.

A hint on the intended value of the Twitter service follows from the preamble on the Twitter homepage (see below). Here it is described how businesses can use twitter to build a community of customers and how they can keep them informed about what's going on in their business.   This preamble is followed by a number of business cases on how private businesses have been successful in connecting to their customer by the use of twitter.

> "Every day, millions of people use Twitter to create, discover and share ideas with others. Now, people are turning to Twitter as an effective way to reach out to businesses, too. From local stores to big brands, and from brick-and-mortar to internet-based or service sector, people are finding great value in the connections they make with businesses on Twitter."
> *Source: http://business.twitter.com/twitter101*

The most well-known delivered value has been the ability to report important news at a faster pace than any other media. This was for instance the case, when an aircraft landed in the Hudson River, and when an aircraft crashed in Schiphol Airport in February 2009 (Wikipedia, 2009). Twitter has also proven to be useful for reporting news from, for instance, Iran.

Organizational design

The following actors are involved in the twitter value chain: Twitter, application developers, access providers, and users (figure 4).

Figure 4: The twitter value chain

Twitter is an independent company. It provides the software for the basic services and operates the common platform. The system is open and developers have free access to both platform and data, and several thousand applications have been developed by third parties (Gustin, 2008), for instance browser plug-ins, photo- and video-sharing applications that enhance mobile and computer based use.

Users include private consumers as well as businesses using Twitter as a channel for marketing. Users can be grouped into three different categories:

1. Broadcasters: Those followed by a much larger number of users than the number they follow.
2. Acquaintances: Those with reciprocity in their relationships, typically online social networks
3. Users following a much larger number of people than following them.

The first group includes various online radio stations which use Twitter to broadcast the song they are playing right now, as well as news media and other businesses. The second is by far the largest group and includes private users. The last group is smaller than the others and includes spammers, who want contact to as many users as possible.

Financial design

The financial design of the Twitter service is subject to vivid discussion on several blogs. So far the revenue Twitter is generating for itself is very limited. A little revenue is generated from users sending and receiving tweets on SMS, but this covers only a small fraction of the costs. Twitter neither charges subscription fees nor provides space for advertisements. Substantial revenues are generated by application providers, but in general these revenues are not shared with Twitter. Exec Tweets Twitter – a site linking to tweets from business executives – shares their revenue with Twitter, but this is an exception.

Revenues from advertisements or a fee imposed on businesses using Twitter as a marketing channel are obvious possibilities. There is a risk that especially advertising will reduce the perceived value of the service and that users will migrate to other platforms. The use of SMS as a delivery channel puts strict limitations on how to advertise without annoying users. On the other hand, it is very likely that companies would be willing to pay a fee for using Twitter to stay in contact with their customers. The focus on this application on the Twitter homepage could indicate that this option is seriously considered by Twitter. Other suggestions, which have been put forward, are to offer search engine facilities to companies or to sell the company and its customer base to, e.g., Google or Yahoo.

However, the company seems to be confident that it will be possible to leverage its huge population of users at some point of tome. Stone – a co-founder of Twitter has said that they will build the audience first and the revenue streams later (Gustin, 2008). Ewan Williams – another co-founder – has the same opinion:"We are not worried about growing users, we're not worried about monetization, we're just worried about making a fantastic product" (Miller, 2009).

5. Conclusion

Facebook was launched in 2004, YouTube in 2005, and Twitter in 2006. They are thus very new service platforms but they already have millions of users and their valuation is counted in billions of US$. Facebook, for instance, announced – in November 2009 – that they have more than 300 million active users, and YouTube was sold to Google Inc. for US$ 1.65 billion just 1½ year after having been launched. These are, by any ratings, extraordinary developments, which one will not find in any other line of business, and they illustrate the power of network effects, where the utility of the individual users depends on the presence and usage of the network by other users. The cases described in the present paper are clearly examples of web 2.0 services, where the services provided by the networks are dependent upon content created by the users.

The three cases, YouTube, Facebook and Twitter, have different profiles and purposes. YouTube is basically a video-sharing site, while the core service delivered by Facebook and Twitter is social networking. YouTube, however, also includes social networking applications and there is a considerable degree of overlap between the different service platforms. Facebook, for example, can be used for video-sharing just like YouTube. They start out with a more specific purpose but quickly develop a broader portfolio of applications. Twitter, for instance, is the only one of the three platforms which included a dedicated mobile platform to begin with, but YouTube and Facebook have also available on mobile platforms as is the case with many other web-based services.

The paper gives a basic description of the business models of the three platforms, YouTube, Facebook and Twitter, using a business model framework including service design, organization design, technology design, and financial design. However, the main question of the paper is how these networks make money as this is the common issue of many of such networks. Emphasis in the introduction and conclusion is, therefore, on the revenue part of the financial design aspects.

The basic premise – as it is stated in the introduction – is that it is almost impossible to get people to pay for access to such service platforms. If a platform starts charging for its services, it is more than likely that users will migrate to other platforms. The lock-in effect is relatively weak. Although users spend some time on building their profiles on Facebook, information can relatively easily be shifted to other platforms. The strongest lock-in effect is related to the network character of these platforms. Users are attracted because there are other users on these platforms. The network effect in itself creates a degree of lock-in. However, experience from other temporary network (quasi)monopolies shows that market dominance, which is almost total, can shift to another provider in a relatively short while. Even hundreds of millions of users do not guarantee an everlasting monopoly, which is why these networks expand with complementary services, not only to increase the utility of the users and to seek new potential revenue possibilities but also to increase the lock-in effect. Not only direct network effects attract and retain users. There are also indirect network effects associated with the complementarity of applications.

There are, of course, social networks of a more exclusive character, where users can be charged an access fee. This applies to networks of business users and also applies to networks built up around very specific areas of interest. In general, however, revenue streams have to come from other sources. Until now, a major 'revenue stream' has been venture capitalists being willing to invest money in such networks based on the expectation that they, at a point of time, will be profitable investments. But which are the existing and potential revenue streams which will make these investments profitable?

Advertisement is the obvious answer, and advertisement is, e.g., the major revenue source for YouTube and has also started becoming a source of income for Facebook. In the case of Facebook, however, it is not until 2009 that advertisements have become a revenue source. Furthermore, Twitter has not yet started exploiting this possibility. There are, indeed, also some limitations of a technical character for using Twitter as a platform for advertisement, namely the number of possible characters in a tweet. However, there are potentials to charge business users for the tweets that they write, calculated on the basis of the number of 'followers' they have. And, with Twitter on fixed Internet, advertisement becomes a stronger potential.

Another possibility is to charge the partners that these networks have: either application developers or content providers. To the extent that applications and content are used, application developers and content providers can charge the users and pay a share of this to the social network providers or the networks can collect the fees and distribute a percentage to the application or content providers. Facebook, for instances, announces that there are currently more than 350,000 active applications on the Facebook platform and more than one million developers and entrepreneurs have been involved. The reality is, however, that these networks make very little money on application developers. And, in the case of YouTube, it is actually YouTube that pays content providers. This applies to professional content providers but also to some user generated content. YouTube makes its money on advertisements and then pays a fee to content providers based on their partnership program.

Advertisement revenue can be expanded heavily by selling targeted advertisement space. This is a great opportunity for social networks as they can assemble detailed information on their users: their profiles and their usage patterns. And not only can they charge advertisers higher fees; they can also sell the information of a (more or less) anonymous character based on their knowledge on their users. However, depending on the legislation of different countries, social network providers are here potentially in conflict with laws on privacy protection.

Further sources of revenue are, in the case of Facebook, the selling of virtual gifts. This is becoming an important area for Facebook. Also direct contracts with device manufacturers will be increasingly important. An growing trend is that device manufacturers in the mobile area put specific applications directly on their terminals, circumventing the mobile network operators in a 'device centric' business model. While the traditional business model in the mobile area has been 'operator centric' in the sense that network operators have been working (more or less) closely with device manufacturers, on the one hand, and content and applications providers, on the other, more

and more one sees a direct cooperation between device manufacturers and application providers, including social networks. This, one can witness, for instance, in the case of Facebook.

In summary, the basis of these different streams of revenue is related to the platform character of the social networks. To a different degree, they constitute multi-sided platforms which coordinate the demands of distinct groups of customers who are dependent on each other. This includes an open innovation model, where many of the actual applications on the networks are developed and provided by external developers. The platform business models constitute a line of business approaches that one will see to an increasing degree. They release the potentials of the Internet as an interactive social platform.

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