

Fostering collaborative innovation across disciplines: A community based approach

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supervised by

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Affidavit

I, **Johannes Reitermayer**, hereby declare

1. that I am the sole author of the present Master's Thesis, "Fostering collaborative innovation across disciplines. A community based approach", 54 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

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1 Introduction

Social networks create value by enabling users to join existing communities or build new ones on the fly based on interests across disciplines. The Internet is the enabling driver for social networking and vice versa (Unknown a, 2010). It is a phenomenon reflecting change in the way people communicate and a major driver that creates a market that is still hard to grasp from an economic point of view. I will explain that Facebook¹, Twitter², Tumblr³, and Yammer⁴ are shaping social and corporate networks towards a dominant design that will have to include a business model for sustainable growth and sufficient financial resources to persist in a highly competitive and demand driven market.

Facebook reports over 500 million active users, Google recently ranked it as the most visited site worldwide (Unknown b, 2010) and it is ranked at second place on Alexa (Unknown c, 2010). On average each Facebook user is connected to 130 friends (size of personal social network), sends 8 new friend requests per month (6% growth rate), belongs to 13 groups (communities with different interests) and spends 55 minutes per day on social networking. This makes Facebook an ideal platform for Open Innovation that will soon have profiles of 7% of human population on earth.

Facebook networks are built on user profiles and growing "friend"-, "fan"- or "like"-relationships. Microblogging is even more real-time as it is an "... act of posting short messages to the Web" (Nesbitt, 2010) and appropriate for distributing news, getting immediate feedback, or brainstorm ideas. It derives from short messaging service (SMS), instant messaging (IM) and blogging concepts (Fitton et al., 2009) enhanced by Internet opportunities. Google ranked Twitter as the most popular microblogging platform (Unknown b, 2010). It ranks at 11th place at Alexa (Unknown d, 2010).

¹ <http://www.facebook.com>

² <http://twitter.com>

³ <http://www.tumblr.com>

⁴ <https://www.yammer.com>

Figure 1 (Moore, 2010) depicts user growth rates and the reported 75 million users by the end of 2009. Recent corporate announcements already mention 105 million users (Niccolai, 2010).

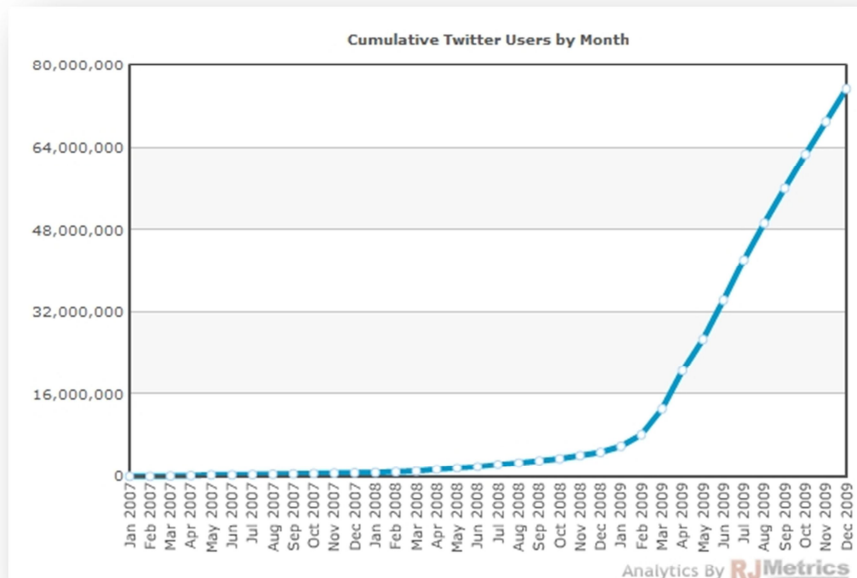


Figure 1: Twitter user growth

It is interesting to learn from Twitter co-founder and CEO Evan Williams (2010) about corporate strategy: "I have no idea what will happen next with Twitter. But I have learned to follow the hunch, but never assume where it will go." This ultimate demand driven strategy was successful and resulted in a takeover bid from Facebook in 2008. Facebook's co-founder and CEO Mark Zuckerberg (2010, cited by Unknown, 2010) said that he "...was afraid that microblogging site's growth would outpace that of the social network". Today both services regard each other as complementary.

Tumblr ranks on 143th place on Alexa (Unknown e, 2010) and is an advanced microblogging solution positioned between full featured blogs like Wordpress⁵ or Google Blogger⁶ and 140 character-limited Twitter. It was founded in 2007 by David Karp who was 21 years old at that time. In 2009 he was elected as the best Tech Entrepreneur by BusinessWeek (Unknown f, 2010).

⁵ <http://wordpress.org>

⁶ <http://www.blogger.com>

Yammer is also a microblogging platform that differentiates from Twitter by focusing on corporations "making a company more like a community" (Sacks, 2010). Users are faced with the question "What are you working on?" instead of Twitter's "How are you doing?". It was founded in September 2008 by David O. Sacks who ran PayPal⁷ as COO until the eBay⁸-takeover and is already ranked at 15.717th place by Alexa (Unknown g, 2010).

Every Yammer network is set up as private and can be subdivided into groups. Yammer communities extend corporate networks towards B2B social graphs (Sacks/Scoble, 2010). The company reports 60,000 registered corporations and 1,000 are paying for advanced services (Sacks/Scoble, 2010).

Social information flows from (micro-) blogging- towards social- or corporate networking platforms. Figure 2 shows that information entered via Twitter or Tumblr is pushed towards platforms like Facebook or Yammer.



Figure 2: Information Flow

The differences between Facebook and Yammer are privacy and control over data. Data flow is unidirectional and separated into social and corporate streams by design. I will investigate if a bidirectional data flow mixing social and corporate streams would encourage social networking tasks (chapter 4.1, p.25) that are critical for Open Innovation.

A fundamental problem of corporations following the Open Innovation approach is that they want to utilize social networks to collaborate with new stakeholders but also claim control over privacy and data. On the one side corporations enforce security policies that limit employees via governance to dedicated roles and standardized business processes. On

⁷ <https://www.paypal.com>

⁸ <http://www.ebay.com>

the other side social networking tasks require the integration of corporate and private streams especially when collaborating across disciplines. This dilemma forces corporations to make a decision about their virtual identity. Staying with the common corporate centered view of the world might have a negative impact on utilizing the biggest driver for growth in the Internet: social networks. Giving up IT-control over employee's behavior is challenging but a prerequisite. Understanding that social collaboration takes place regardless of corporate attitude is the point. The corporate challenge shifts from "Should we prevent access to social networks?" to "How can we utilize and support them?"

Chesbrough (Chesbrough, 2003) coined the term Open Innovation that comprises the concept of the innovation funnel and the state gate process. The fuzzy social front end is the area of interest for this paper. It is the initial phase of the generic innovation process where opportunities are initially screened and hopefully transformed into ideas at a high degree. The wisdom of crowds (Surowiecki, 2005) as utilized by crowdsourcing (Howe, 2008) is a promising source for the innovation process. This is especially true if a corporation commits itself to Open Innovation. Corporations publish challenges and request potential ideas from undefined sources thus opening the solution space and source. The scope of this paper builds on the existing funnel concept. I will investigate if enhancing social noise in front of the funnel could have a positive impact for innovation.

Open innovation relies on social networks and communities. Recent research (McDermott/Archibald, 2010) discovered that there is a trade-off between "communities of practice" and those that are formally integrated into management structures. Informal communities thrive until a certain point in time where additional communication overhead caused by growth has a negative impact on creativity and efficiency. The assumption that management attention would have a negative impact did not hold in all phases. The authors summarize their findings in what differentiates operational teams from communities: "...successful communities have goals, deliverables, assigned leadership, accountability for results, and metrics" (McDermott/Archibald, 2010). This insight is essential for this paper as it provides a good starting point looking at the problem area from the organizational point of view. Other research (Boudreau/Lakhani, 2009) discovered that collaborative communities and competitive markets have different strengths depending of the type of innovation, motivation of the individuals, and nature of the platform business model. I will

not investigate managing the innovation process or finding the right solution space inside or outside a corporation. I will rather try to find tasks outside corporate boundaries that have a positive impact on innovative communication and collaboration across disciplines.

Corporations and social networks have different objectives but share innovative collaboration. I will investigate the social networking area that is the potential source for Open Innovation. The main research question is: What value can be offered to existing communities to enhance innovative collaboration across disciplines (in the first phase of the open innovation funnel)?

The results of this paper are social networking tasks (SNTs) that foster innovative collaboration. Those that add value bridging the gap between disciplines have been discussed in detail. SNTs are based on a social experience model that complements the generic business model from the view of social networking. The presented examples demonstrate the challenge matching both worlds.

2 Literature and Market Overview

2.1 Social Networking

Social computing is defined as "people become part of the overall computation system by examining, analyzing, and addressing the issues" (Shah, 2010) of problems that "...require ingenuity or associative thinking, relationships and trust between people, and subjective knowledge" (Shah, 2010). It depends on human factors like social tasks, what encourages participation and software. Social networking comprises all kinds of social software tools that build networks of relationships (Shah, 2010).

I will define a few concepts before mapping literature about social networking to the market. Governance "...sets the policies and procedures for ensuring that things are done in a proper way" (Unknown h, 2010). Leadership and management implement these policies on a daily basis making the right decisions. Governance is about finding a vision and deriving appropriate policies that are executed by management. Governance in the context of social networks means answering the questions "How goals and directions are set" and "Who elects the leaders". Participation determines the openness of a network and answers who decides who may join.

Table 1 (Shah, 2010) lists various governance/leadership models found on the social network and adjacent markets. The first three models build on hierarchical structures used by most companies today (Shah, 2010) that regard top down control as main impact on operational excellence. The last two models at the end of the table are completely decentralized. All other models vary between these two extremes. The idea behind the Starfish-model is derived from observations made in industries where decentralization changed common business models (Brafman/Beckstrom, 2006). The Swarm-model considers crowd-effects that occur because of its democratic approach. Every individual takes responsibility for personal actions that are solely based on free decisions. These self-organized actions aggregate into social behavior. Social and corporate networks are different in governance and leadership. Open Innovation changes the corporate view on participation but the most encouraging step is still challenging: adjusting governance to reach compliance with social networks. I personally do not expect this to happen the other way around.

Type	Leader selection	Participation	Direction	Example
Centralized	Leaders are selected by sponsors and can transfer leadership to anyone they choose	Leaders have total control over all content in the environment.	Leaders have total control over directions	Traditional Web site
Centralized with input		Leaders have majority control over the content, but they enable users to add secondary input.		Individual or group blog, wiki editable by a core team
Delegated		Leaders share control and enable others to enter input, but still have the option to control or edit this input.		Vendor supported forums or wikis
Representative	The membership elects leaders	All members have equal capabilities and rights to participate, but leaders might have additional administrative control over the environment.	Leaders have equally shared control over direction	Large industry standards workgroups (e.g. W3C ⁹)
Starfish	Leadership is purely voluntary from members	Everyone has equal basis and capabilities, but members agree to follow some general principles, rules, or ideologies.	Leaders have no/little control	Wikipedia
Swarm	No explicit leadership exists	Everyone has equal basis to provide input, with either only a basic definition of the input format or no definition.	Direction is aggregated through the combined effect of the swarm	Digg ¹⁰ , Delicious ¹¹

Table 1: Social Leadership Models

⁹ <http://www.w3.org>

¹⁰ <http://digg.com>

¹¹ <http://delicious.com>

A closer look on what is going on inside those networks exhibits that information is basically exchanged in form of messages. Formats vary from text-only to semantic content. Processing can be synchronous (e.g. IM) or asynchronous (e.g. e-mail). On corporate networks participants retrieve contact details via shared directories. Social networking platforms work the other way around. Messages are sent to streams that are discovered by others. Information exchange moves from a 1:1 push to a 1:n publish/subscribe model. I have summarized other communication relevant criteria in Table 2.

		Facebook	Tumblr	Twitter	Yammer
Participation	User Metadata	Social profiles			Corporate directories
	Groups	Yes	Yes	No	Yes
	Communities	Yes	Yes	No	Limited
Privacy	Public	Yes	Yes	Yes	No
	Private	Yes	Limited	Yes	Yes
	Restricted	Yes	Yes	Limited	Yes
Feedback	Comments	Yes	Yes	Retweeting	Yes
	Ratings	Yes	Yes	Yes	Yes
Interfaces	Applications	555,000	Yes, # not published	70,000	No
	API	Yes ¹²	Limited ¹³	Yes ¹⁴	Yes ¹⁵
	Mobile apps	iPhone, Android			
Categorization	Keywords	Tags/Categories	Tags	Hashtags	Hashtags
	Geo-Tags	No	No	Yes	No
	People-Tags	Yes	Yes	Yes	Yes
Promotion	General	Widgets, buttons			
	Individual	Yes			
Streams	Import	Yes			
	Export	Yes			No

Table 2: Social networking feature comparison

¹² <http://developers.facebook.com>

¹³ <http://www.tumblr.com/docs/en/api>

¹⁴ <http://dev.twitter.com>

¹⁵ https://www.yammer.com/api_doc.html

In this context participation comprises metadata about users, groups and communities. Corporate networks provide a higher degree of trust amongst participating parties but lack the critical requirement for Open Innovation to be extended across security domains. On the one side there are Facebook groups and communities that are easy to create, maintain and join for everyone. The other side is Yammer's approach imitating corporate features in a social environment under complete control of a single corporation. In the middle I discovered that Twitter does not support group or community concepts per se but has managed to engage third parties to provide competitive solutions (e.g. GroupTweet¹⁶, Tweetworks¹⁷, Tweetparty¹⁸, TwitterTeams¹⁹). I regard the participation question "Who decides about others joining" to be derived from the chosen governance model. Open Innovation should lower the importance of this criterion compared to the following ones. It finally depends if the innovation process is seen from a corporate or social networking perspective.

Privacy is about the restricting access to personal information about a user or group. The difference between the solutions is the level of granularity. Social network privacy basically works at the level of feeds and not individual messages. Yammer privacy is stronger and utilizing enhanced security technologies. The key question "How to handle privacy in mixed environments like Open Innovation?" however is not answered by any solution.

User feedback has changed over time. I believe that the following statement of Don Tapscott's son is a good example how technological innovation has already changed the mind of users: "We're given the technology that allows us to be mobile, so I don't understand why we need to be restricted to a desk; feels like you're being micromanaged" (Tapscott, 2009). The feedback criterion represents the cultural change and is biggest advantage of social networks. All solutions encourage intra-solution feedback using common types (e.g. comments, star-ratings).

¹⁶ <http://www.grouptweet.com>

¹⁷ <http://www.tweetworks.com>

¹⁸ <http://www.tweetparty.com>

¹⁹ <http://twitterteams.com>

Figure 3 shows a new way of providing feedback introduced by Facebook. It is capable of handling intra- and inter-solution feedback.



Figure 3: Facebook Like-button

Competition has already closed the gap and promoting through the social cloud has been established as standard. Microblogging acts as an accelerator pushing thoughts towards social networking platforms. Some users have the role of opinion leaders. Their tweets are frequently retweeted by followers to their followers. The accelerator is a very powerful communication instrument pushing information to the crowd. Barack Obama for example utilized social networks during the presidential election campaign. Today he has 4.5 million followers on Twitter (Obama, 2010) that listen to his staff's tweets. The psychological driver behind this accelerator is that people appreciate having many followers raising their social status in the community. First there is the threat of having no followers which means that the user not much to say. Once there are followers there is the challenge not to lose followers to competing opinion leaders. There is an ongoing global social competition.

Interfaces express the chosen governance model of a solution. Facebook and Twitter are following an open approach asking third parties to add additional value via applications. The figures show that they are doing pretty well. All social platforms also offer software to leverage the growing mobile segment (e.g. smart phones).

Categorization is supported by all solutions. It allows users to scan feeds, attach keywords (tags) or assign relationships to hierarchies (categories). This is a major requirement for cross discipline collaboration.

Streams reflect the market position. Dominant players like Facebook import almost any kind of social stream originating from the blogosphere and the microblogging-market. Small players like Yammer differentiate by features but do not have a similar impact on absorbing social streams yet. Streams have different privacy levels. They are designed to separate private from corporate data right from the beginning.

Social networking platforms rethink their business models, add advertising and start mixing privacy scopes. Figure 4 (Forrester, 2009, cited by Dyer, 2010) depicts that future compound annual growth rates for social and mobile marketing expenditure are very high although still low in absolute numbers compared to established marketing instruments like search marketing (e.g. SEO). This shows that privacy will remain a top issue for social networks.

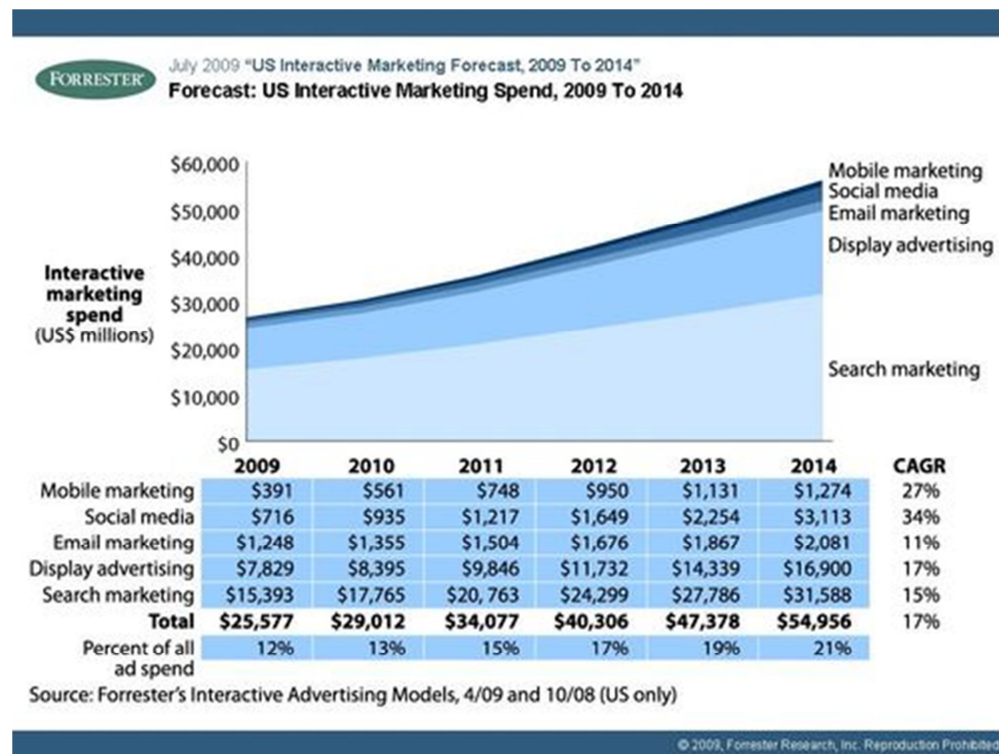


Figure 4: US Marketing expenditure 2009-2014

Facebook sells user data to advertisers (Clippinger, 2010) and Twitter plans to charge for promoted tweets (Abell, 2010). Yammer always had a multilevel subscription model (Unknown i, 2010) that is based on additional privacy. Privacy could turn out to be the new currency on social networks that apply a business model.

Next I will describe five generic business models for social networks (Loayza, 2010) and comment on the impact of the criteria introduced before:

Business Model	Description	Impact of			Example
		Governance Leadership	Participation	Privacy	
Freemium Model	Free basic services and optional premium services features for paying members	High	Low	Low	Yammer
Affiliate Model	Driving traffic or generating sales leads for other affiliated platforms	High	Low	Low	Google AdSense ²⁰
Subscription Model	Users sign contracts based on repeating payments. Longer subscription contracts usually contains higher discounts	High	Low	Low	Vimeo ²¹
Virtual Goods Model	Users pay for virtual goods	High	Low	Low	Facebook Gifts ²²
Advertising Model	Advertisements are sold against traffic on a site	High	Low	High	Facebook

Figure 5: Social Networking Business Models

The results show that governance and leadership have a high impact on the chosen business model. This shows the need of social networking solutions to find revenue generating business models and map them closely to the value adding social experience (chapter 2.2, p.15). Participation's impact is generally low because all examples attract a broad audience. All examples are open for user registration without restrictions. The impact of privacy is typically low with the exception of Facebook. It sells user privacy to corporations that want to attract the attention of certain user groups (e.g. regions, age).

²⁰ <http://www.google.com/adsense>

²¹ <http://vimeo.com>

²² <http://www.facebook.com/giftshop.php>

2.2 Template for Social Networking Tasks

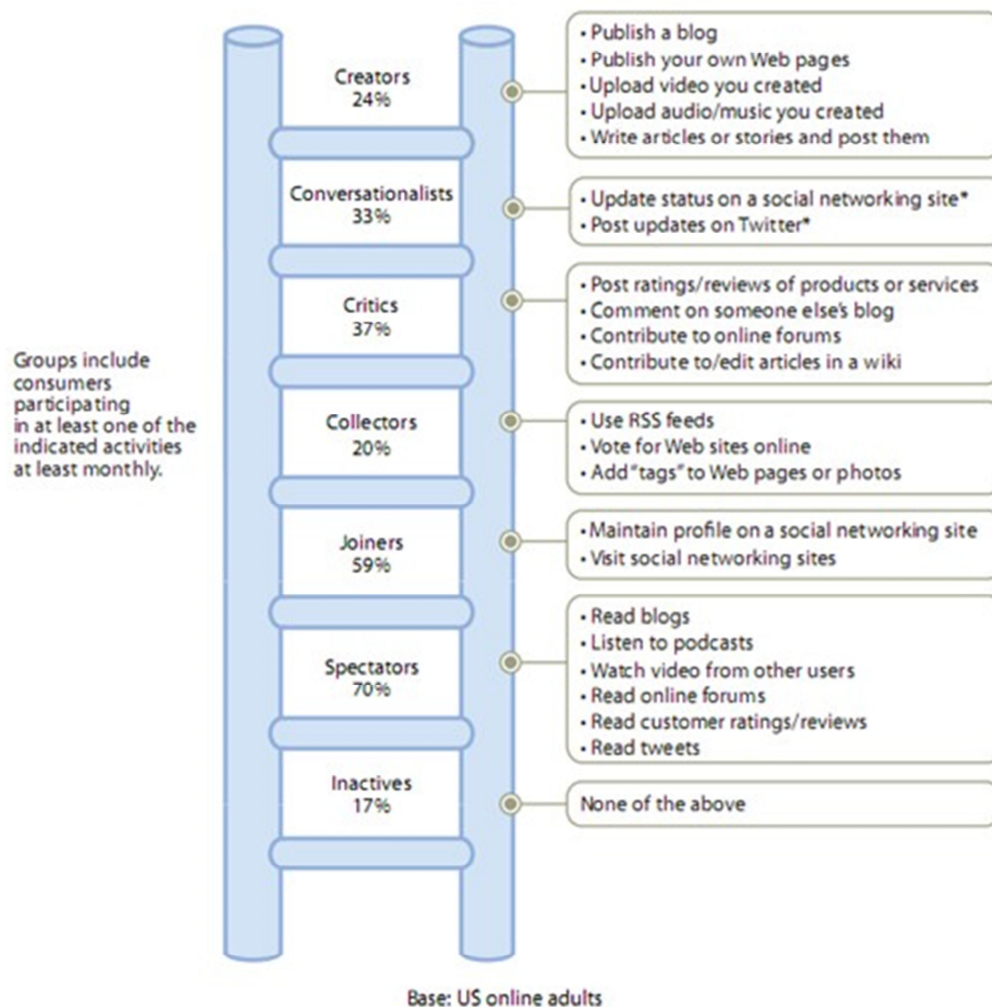
Research on Open Innovation on social networks necessitates the switch from revenue generating business models to social experience models. The Table 3 lists various models (Shah, 2010) and describes the value that is generated for users. Social experience models go beyond business models because they explain crowd activities that are not driven by monetary incentives. The examples are taken from the selected microblogging and social networking platforms chosen at the beginning of this paper.

Model	Example	Value generation
Individual	Blogs	Each user can add content that is visible to the public
Social Network	Facebook	Each user can build relationships to others (friends) and share information inside this scope
Closed Workgroup	Facebook groups	A subset of friends that collaborate on a common subject
Visible Workgroup	Facebook and Tumblr pages	A public side visible to the public sharing information on a general topic, corporation, brand, product, etc.
Community	Facebook and Yammer communities	A group of platform-users that work together across corporate boundaries
Mass Collaboration	Twitter timelines	Beyond individual information, the experience aggregates inputs into collective results

Table 3: Social Experience Models

The concept of social profiles complements social experience models as they categorize participants. Figure 6 (Forrester, 2009 cited by Hsu, 2010) lists activities (on the right) that belong to social profiles (on the left). Users may belong to several profiles depending on actual activities. But the ladder-concept of social profiles also shows consumer's technology adoption starting from inactives to creators (Bernoff, 2009).

Creators are the most active group contributing content. Conversationalists are users that synchronize their real life activities with a stream of status messages on social networking platforms like Twitter. Critics are also active adding value but only complement to creator's output. Collectors rate Websites via services like Digg or Delicious that aggregate ratings. Joiners maintain online profiles on social networking platforms like Facebook that connects all other participants. Spectators have a passive role and consume what others contribute. Inactives comprise the rest of the online community.



Source: North American Technographics® Empowerment Online Survey, Q4 2009 (US)

*Conversationalists participate in at least one of the indicated activities at least weekly.

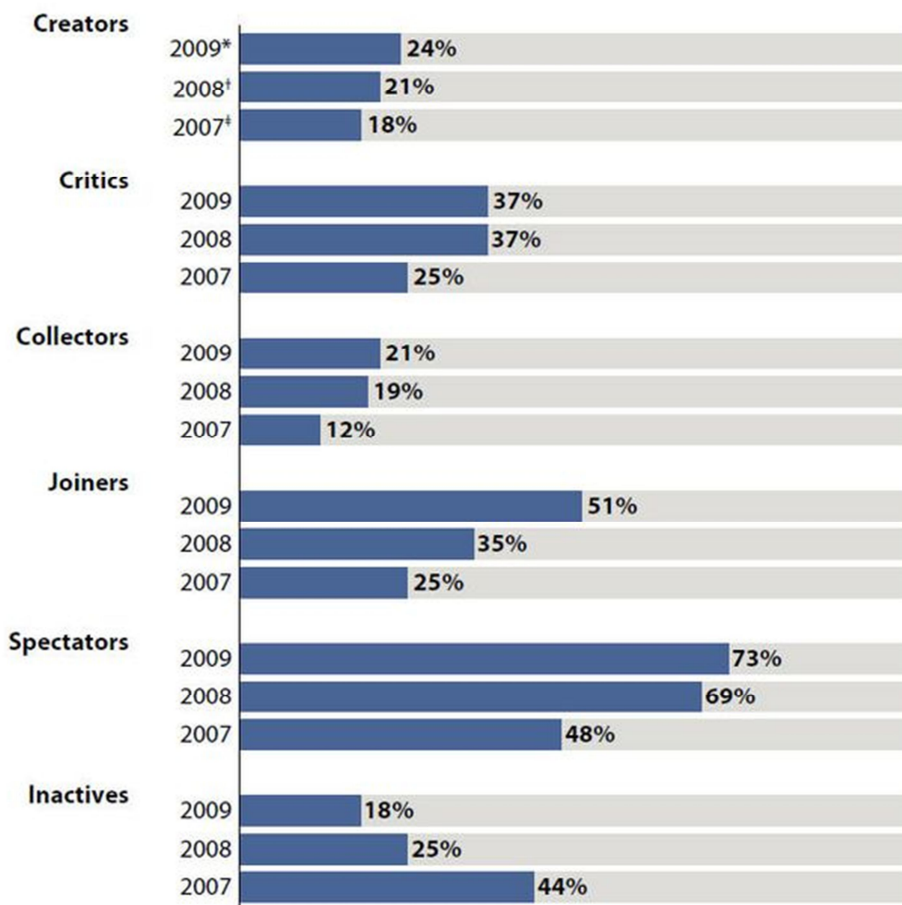
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Source: Forrester Research, Inc.

Figure 6: The Social Technographics Ladder

Figure 7 (Bernoff, 2009) depicts that the group of joiners increased significantly. This reflects growth rates of social networking platforms where inactives were invited to join in obviously. The high percentage of 73% of spectators might be caused by the inability to explain the value added to the broad public and is not caused by the ongoing privacy discussion because the group of critics remains unchanged.

Figure 2 More Than Four In Five US Online Adults Now Participate Socially



Base: US online adults

*Source: North American Technographics® Interactive Marketing Online Survey, Q2 2009 (US)

†Source: North American Technographics Media And Marketing Online Survey, Q2 2008

‡Source: North American Social Technographics Online Survey, Q2 2007

55132

Source: Forrester Research, Inc.

Figure 7: Social Technology Adoption by Profile

I have aggregated data from Forrester's widget (Bernoff, 2009) in Figure 8. It shows results of the social technology adoption compared by region in 2009. European data is consistent (e.g. UK, Germany) and has the same shape as US data. Each profile has a higher percentage in the US which shows that social technology originates from the US.

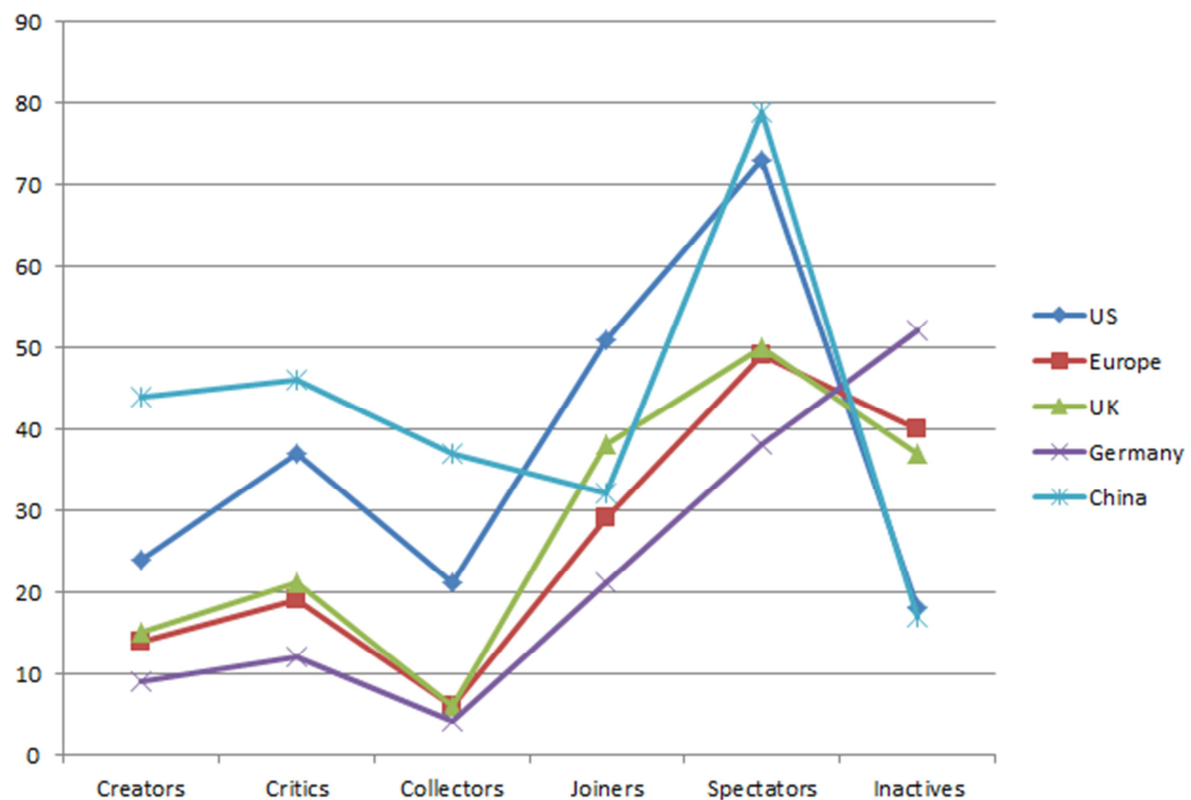


Figure 8: Social Technology Adoption - Regional Comparison

Forrester defined social profiles comprising activities. Activities are similar to social tasks that are "...a larger view of collaborative work" (Shah, 2010). Table 4 (Shah, 2010) shows a template for social tasks.

	Description
Task	General description about what activities are involved
Beneficiaries	Stakeholders who benefit from execution
Aggregation	Specification of collaborative execution: Independent, autonomous, consensus, deliberate, combative
Experience	Examples
Leadership	The chosen leadership model

Table 4: Template for Social Tasks

To be more precise I renamed the term "social tasks" to "social networking task" and extended the previous template to fit the research question. Table 5 shows an extended template for social networking tasks.

		Description
Social Task		Name
Example(s)		
Value added		What are the benefits generated for the business- and social experience model?
Impact of	Governance	Who sets policies and procedures?
	Leadership	Who executes them?
	Participation	Who decides about who may join?
	Privacy	Who decides about unveiling detailed results to the public?
	Aggregation	Who decides about assigning social networking tasks to individuals?
Open Innovation		Is this this social networking task relevant for Open Innovation?
Cross Discipline relevance		Can this social networking task help to encourage innovative collaboration across disciplines?

Table 5: Innovative Template for Social Tasks

2.3 Open Innovation

I have described how social networking changed the way we communicate and collaborate outside corporate frontiers. Open Innovation on the other - corporate - side is defined as a "paradigm shift in how companies commercialize industrial knowledge" (Chesbrough, 2006). Social networks and Open Innovation have in common that they challenge our habits. Chesbrough brings the impact of both paradigm shifts to the point referring to Heraclitus: "The only constant is change" (Chesbrough, 2006).

Closed Innovation originates from the internal focused logic of a corporate value chain. It is vertically deeply integrated and dominated by a single player. There is a close relationship

between research and development (R&D) as the source of innovation and development that transforms R&D-outputs into products. This process is derived from corporate strategy and dedicated to existing markets. The entity product never leaves unlimited control of the company. An idea is born inside corporate boundaries, developed and maintained by its product lifecycle in-house and finally regarded as intellectual property that has to be protected from competitive utilization. Figure 9 (Chesbrough, 2006) depicts this Closed Innovation-model where all ideas (circles) are pushed from research towards the market, always staying within corporate boundaries (solid line of the funnel).

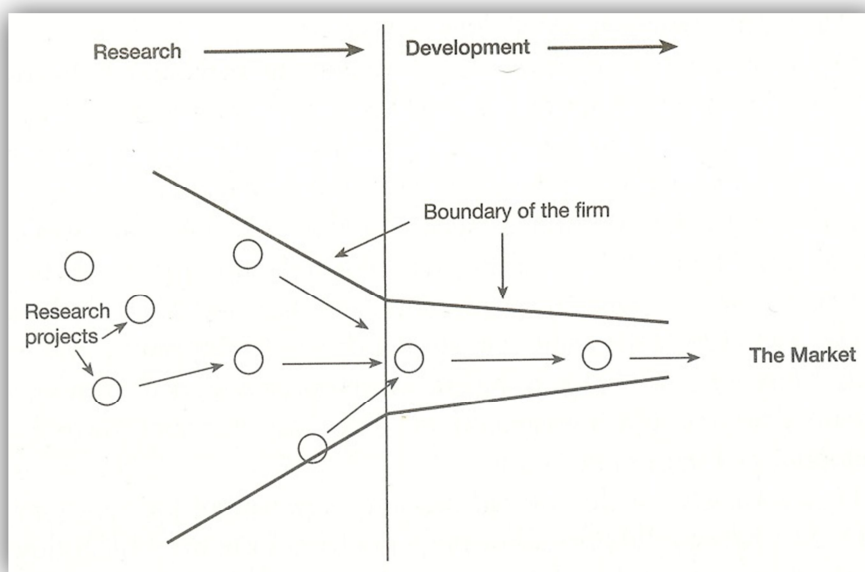


Figure 9: The Closed Innovation-model

This model dominated most industries during the last century (Chesbrough, 2006). The US-government played an important role decentralizing knowledge (Chesbrough, 2006) shaping this model. It funded basic scientific research to be conducted outside governmental labs making the government, industry and military equal partners in research. These increased decentralized knowledge pools encouraged corporations to raise their R&D investments. The resulting golden age of internal R&D (Chesbrough, 2006) changed whole industries to be dominated by only a few big players (e.g. AT&T, IBM) with deep vertical integration. Any part that could not be made internally was regarded as low quality, performance, availability or would not scale with demand ("Not invented here"-syndrome). Different objectives and deadlines loosened the linkage between R&D and development. Figure 10

(Chesbrough, 2006) depicts that ideas were withdrawn internally from development and later also used externally from employees leaving the corporation.

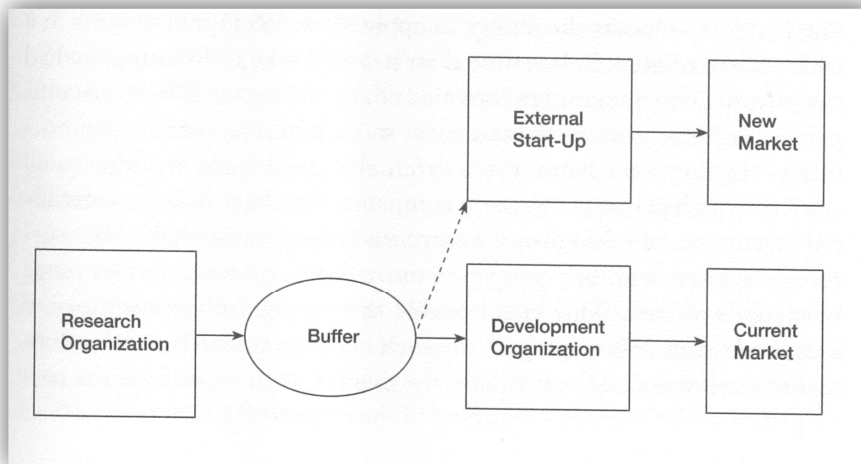


Figure 10: Ideas on the shelf

Startups developed competitive products or specialized in the supply chain by offering parts that had been built internally before. This challenged corporations following this closed approach because new suppliers offered product-differentiating components to the competition too. The Closed Innovation-model is based on recruitment of the best people available on the market and causes above market salaries to prevent external startups. The growing mobility of highly skilled people and availability of private venture capital are opposing drivers in recent years (Chesbrough, 2006). In highly competitive markets time to market constraints add to these factors eroding the Closed Innovation-model.

Figure 11 (Chesbrough, 2006) shows changes by the Open Innovation-model. Ideas (circles) originate from inside and outside leaking corporate boundaries (dotted-funnel) even after the research phase ("inside out"). Those that do not fit to current markets are kept and evaluated towards new markets or are utilized by startups externally. This is also true for ideas originating from the outside for existing markets ("outside in").

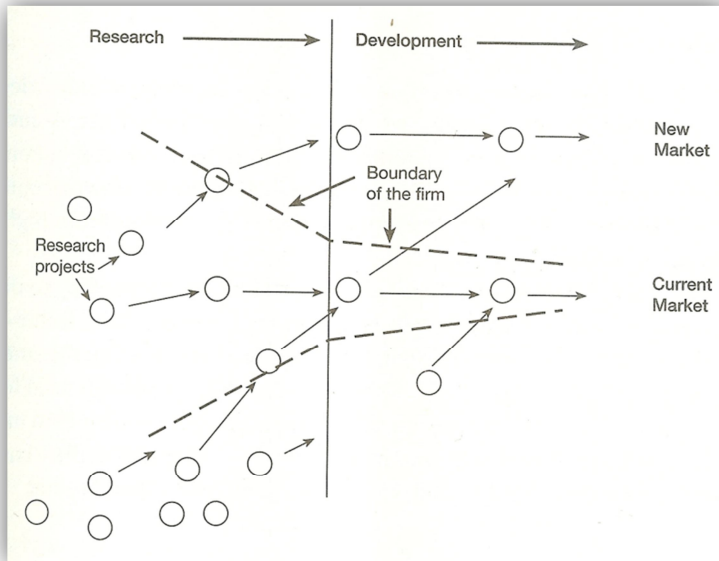


Figure 11: The Open Innovation-model

This might not comply with existing corporate strategy but provides the advantage of recovery of "false negatives". These are ideas that have been regarded as negatives from the current corporate focus but turn out to be valuable in a different setup.

Table 6 (Chesbrough, 2006) lists fundamental changes between the Closed- and Open Innovation models.

Closed Innovation	Open Innovation
Smart people in our field work for us	Bill Joy, Sun-cofounder: "Innovation happens elsewhere" - "there are always more smart people outside a company than inside it".
Profit derives from R&D	From internal and external innovation (e.g. Cisco, Oracle)
Be first on market	Radical innovation
The best ideas win	Co-created ideas create new markets
Control intellectual property	Business models with joined social experience

Table 6: Closed- versus Open Innovation

3 Research Design

3.1 Prototype Design

This chapter covers two designs for an Open Innovation platform. The objective is to provide basic innovative services to communities to encourage cross discipline collaboration. The first approach is based on the delegated leadership model (Table 1, p.8), is operated on a proprietary platform on the Internet and took 6 month of coding. The alternate approach features the swarm leadership model (Table 1, p.8) and could be implemented by a Facebook application that interoperates with backend services.

The scope of the WWW-based pilot²³ was to validate the research question and to analyze user acceptance and expectations. The solution is capable of maintaining, categorizing, sharing and rating of ideas (Figure 12).

Figure 12: Main Screen

²³ <https://viennovate.com/ideas/admin/login.php>

Users can share ideas to the public, a community (inner circle) or keep them private. Ideas are related to tags (keywords) and categories (keyword hierarchies) to enable matching across disciplines. Live statistics are displayed at the bottom of the login-screen.

The screenshot shows a web interface with a 'Login' section and a 'Registration' link. Below the form, a statistics bar displays the following data:

26 ideas	54% private	38% in inner circles	8% public	24 ratings	3 ideas have more ratings than average	19 inner circles
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Figure 13: Login-form and statistics

Any idea is an innovative concept of an individual known to the system as a registered user. It contains at least a description and a value proposition (see Figure 14).

The screenshot shows a form for an idea description. The 'Description' field contains the text: 'Consultants will fill their time-sheets via iPhone. Customers, tasks, etc.' The 'Value Proposition' field contains a bulleted list:

- GPS-data customer-mapping
- Export reports to MS-Excel/Adobe Acrobat or view them online
- Shared access for customers

Figure 14: Idea description and value proposition

A group of users that know each other and want to collaborate on ideas can join an inner circle. Figure 15 shows an idea description and the status of each user working on the idea.

The screenshot shows a form for an idea description. The 'Description' field contains the text: 'This inner circle is dedicated to those of us who are interested in finding new application areas for iPhone apps.' The 'Users' section lists three users with their status:

Member	Bruce Scott
Invited	Steve Wozniak
Inactive	John Warnock

Figure 15: Users of an Inner Circle

The central task is to rate other users ideas (Figure 16).

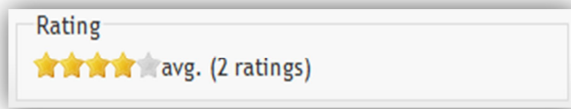


Figure 16: Idea Rating

3.2 Workshop Design

Every workshop started with a presentation to set the scope for subsequent discussion about the research question? Table 7 depicts the workshop agenda that was sent to participants in advance.

Type	Subject	Question/Topic	Planned duration
Presentation	Theory/Scope	Innovation versus invention?	5 min.
		Closed versus Open Innovation?	5 min.
		Social profiles and networking tasks	5 min.
Discussion	Platforms for Open Innovation	WWW versus social networks?	15 min.
	Cross-discipline exchange	Which social networking tasks encourage Open Innovation?	15 min.
Summary of results			15 min.

Table 7: Workshop Design

4 Findings

4.1 Social Networking Tasks

The social graph comprises users and their relationships: "The Social Graph is the representation of our relationships. In present day context, these graphs define our personal, family, or business communities on social networking websites" (Unknown j, 2007). This abstract definition is appropriate for scope of the research question. But it is important to note that "...there doesn't exist a single social graph (or even multiple which interoperate) that is comprehensive and decentralized" (Unknown j, 2007). Facebook's social graph is the largest available today but there are others too²⁴. I will use the term social graph as a conceptual framework for social networking tasks (SNT) that are completed by users on a nonprofit basis. SNTs are user activities that shape the social graph. In a business context they match core business processes. Table 8 compares key concepts from the business to the social networking side.

Concept	Business	Social Networks
Processes	Core business processes	Social networking tasks (SNTs)
Examples	Procurement, production, sales	Publishing, complementing, promoting
Context	Business model	Social experience model
Objectives	Vision, mission	Social graph
Workflow	Open Innovation funnel	Swarm movements
Leadership	Centralized, hierarchical	Decentralized
Participation	Human resources	Profiling

Table 8: Comparison of business and social networking concepts

Table 9 shows the results of the workshops that identified SNTs, investigated their impact on Open Innovation and the innovative exchange across disciplines. The columns below "value added for" depict the benefits for business and social networks. Each SNT has to have advantages for both sides in order to be sustainable. This explains why services like Facebook and Twitter are looking for an appropriate business model.

²⁴ Domain Name System (DNS) in contrast is an unique centralized Internet-related service that maps URLs to IP-addresses and vice versa.

Social Networking Tasks (SNT)	Description	Example	Value added for		Impact of					Relevant for	
			Business Model	Social Experience Model	Governance	Leadership	Participation	Privacy	Aggregation	Open Innovation	Cross Discipline relevance
Profiling	Maintain a personal online profile	Facebook, Linked In	Number of users	Self-maintained network	Yes	No	No	Yes	Autonomous	Yes	No
Publishing	Contribute content to a platform	Blogsphere, ²⁵ Posterous, ²⁶ SlideShare	Raise traffic	Social status	No	No	No	Yes	Autonomous	Yes	No
Complementing	Add detailed information to published content	Geo-tags	Community building	Answers, insights, know-how	No	No	No	Yes	Autonomous	Yes	No
Finding	Find by keywords	Google	Get paid for listing first	Navigation	No	No	No	Yes	Autonomous	Yes	No
Grouping	Create a platform internal group	Facebook pages	Identify lead users	Discuss similar interests	No	No	Yes	Yes	Autonomous	Yes	No
	Create a community across boundaries	Facebook communities	Collaborate in Inner circles	Discuss topics from various point of views	No	No	Yes	Yes	Autonomous	Yes	No

²⁵ <http://posterous.com>

²⁶ <http://www.slideshare.net>

Social Networking Tasks (SNT)	Description	Example	Value added for		Impact of					Relevant for	
			Business Model	Social Experience Model	Governance	Leadership	Participation	Privacy	Aggregation	Open Innovation	Cross Discipline relevance
Classification	Add keywords to objects	(Hash-)Tags	Discover trends	Quick access in complex environments	No	No	Yes	No	Autonomous	Yes	Yes
	Assign object to hierarchy	Categories	Continue along organizational structure	Continue along unknown structures	No	No	Yes	No	Autonomous	Yes	Yes
Promoting	Increase probability of usage by others	(Star-)Rating, Comments, Retweets	Sales, Marketing, Customer support, Churn rates	Feedback, How To-guides	No	No	Yes	Yes	Autonomous	Yes	Yes
Referencing	Link to the original source and author	Bookmarks, Linkbacks, Pingbacks	Intellectual property rights	Copyright	No	No	Yes	Yes	Autonomous	Yes	Yes
Converting	Change content type without altering content	Evernote ²⁷ premium	Time-to-Market	Contribution	No	No	Yes	No	Consensus	Yes	Yes

²⁷ <http://www.evernote.com>

Social Networking Tasks (SNT)	Description	Example	Value added for		Impact of					Relevant for	
			Business Model	Social Experience Model	Governance	Leadership	Participation	Privacy	Aggregation	Open Innovation	Cross Discipline relevance
Filtering	Reduce a stream to a subset	Retweeting	Traffic	Rumors	Yes	No	Yes	Yes	Autonomous	Yes	No
Mapping	Map objects via new relationship types	Facebook friends, employees, stakeholders	Networking across corporate boundaries	Social graph	Yes	No	Yes	Yes	Autonomous	Yes	Yes
Logging	Find historical data	Twitter Search, Bit.ly	Time sheets, anonymous profiles	Diary	No	No	No	Yes	Autonomous	No	No
Composing	Combine several existing objects to a new object	Find new application areas	Identify new markets	Contribute to community ideas	Yes	No	Yes	Yes	Autonomous	Yes	Yes
Inheriting	Create a new type based on an existing one	Mark as idea	Identify new solutions	Extend community ideas	Yes	No	Yes	Yes	Autonomous	Yes	Yes

Social Networking Tasks (SNT)	Description	Example	Value added for		Impact of					Relevant for	
			Business Model	Social Experience Model	Governance	Leadership	Participation	Privacy	Aggregation	Open Innovation	Cross Discipline relevance
Synchronizing	Synchronize contents across platforms	Facebook applications, IdeaScale ²⁸ , getSatisfaction ²⁹	Micro Payments	Facebook games	Yes	No	Yes	Yes	Autonomous	Yes	No
Learning	Learn from other users	Stack Overflow ³⁰	E-Learning, E-Support	Reputation	No	No	Yes	No	Autonomous	Yes	No

Table 9: Social Tasks

²⁸ <http://ideascale.com>

²⁹ <http://getsatisfaction.com>

³⁰ <http://stackoverflow.com>

4.2 An Open Innovation framework for Social Networks

The World Wide Web is designed to display formatted content to users in HTML-browsers. Each communication cycle between a browser and a server forces the current page to be reloaded. Latest technological innovation (e.g. AJAX) relieves this problem by partially updating content but requires additional client side programming (e.g. JavaScript). This shows that the WWW does not fulfill basic social networking requirements. The challenge is to enable users to comment on any content presented in a browser. I can think of two distinct solution approaches. First any content changes should be stored locally and published selectively to social networking sites asynchronously. This would enforce HTML to come of age. But it will take some time until the W3C-consortium will focus on social networking as it recently achieved to include audio and video. The second approach could be based on WWW-browser add-ons. These are small programs that are executed by the browser and enhance default features. The constraint again is missing standards that would define how add-ins could be executed by any browser on any operating system.

Users create mashups pulling any kind of content from external sources and push it to chronological feeds on social networking platforms. The blogosphere provides applications that support this transformation from the (micro-) blogosphere to social networking platforms. Social networking tasks are carried out in the context of the social graph and complement these automated processes. Automatic matching of content that does not contain any semantic uplifts (e.g. semantic web) is a challenge for exchange across platforms. The SNT classification is required to identify content that might be interesting across sites, groups, communities, and disciplines. There are two problems in this field. First there is no globally accepted ontology available. Second platforms do not declare themselves via classification that would help discovery by similar interests. Internet-content that is based on HTML-successors XHTML and HTML5 would already fulfill basic requirements for Open Innovation. Any element in an HTML5-document can be uniquely identified and classified. Additionally a set of subsequent elements can be grouped. Table 10 shows which Open Innovation relevant SNTs already match HTML-tags.

Social networking Tasks (SNTs)	HTML-tag	Example
Identification	id	Book description identified by ISBN
Classification	class	List of books tagged with the keyword "Open Innovation"
Grouping	div	Article incl. header, author, paragraphs, and references
Referencing	a	Links to related sites and documents
Conversion	lang-tag	language meta tag, encoding UTF8

Table 10: Mapping social networking tasks to HTML-tags

Bringing Open Innovation closer to social networking requires social media-ready content and latest Internet technologies. Uploading of proprietary files (e.g. Microsoft Word, Adobe Acrobat) will diminish because they cannot be integrated into value adding SNTs without conversion. The point is that corporations have to anticipate the pace of technological innovation that it is driven by the crowd instead of enforcing business processes in this early innovation stage in front of the innovation funnel. Figure 17 (Maymann, 2008) illustrates this insight. Content was traditionally pushed to and later pulled by the crowd if attention has been drawn to corporate controlled content (e.g. Web sites). The digital generation changed the game following a starfish leadership model and developed SNTs. Corporations that want to participate in social networking platforms will have to give up convenience in governance and leadership. They will have to adopt their business models to complement SNTs.

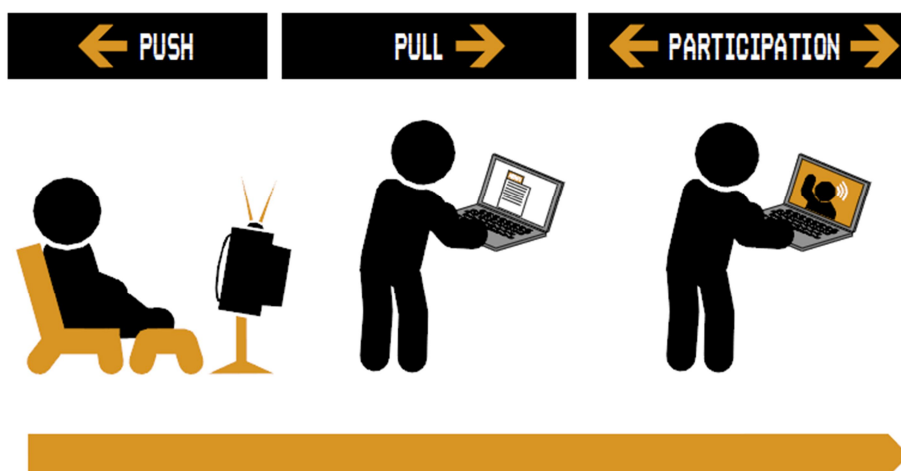


Figure 17: User evolution and the rise of social mass media

Finding and promotion of social media-ready content has already been democratized. Google's search engine rankings (SNT finding) are based on usage statistics generated by the crowd. It relies on keywords defined by users (SNT classification) and actuals link-clicks chosen by personal interest (SNT promotion). This explains why new marketing instruments have been created. Search Engine Optimization (SEO) and Social Media Optimization (SMO) are corporate attempts to fit social networking trends. Push based marketing methods like banner advertisements are coming out of age as new alternatives are being introduced in this field. An example is URL-shortening that is essential for the micro-blogsphere. Bit.ly is a successful implementation for the SNT referencing because it adds value to the crowd by providing usage statistics for shortened URLs. In addition it charges corporations for aggregated statistics that want to learn from top URL-references. This SNT could develop towards advanced semantics like XHTML Friends Network (XFN). It is an HTML microformat that has additional referencing attributes. Table 11 shows an example of a WWW-reference to me and describes this reference as a "friend"-relationship.

<pre>Johannes Reitermayer</pre>
--

Table 11: Example for a "friend"-relationship

Microformat usage will increase as it provides immediate advantages to the end user. Web-browsers parse online content on the fly and provide new options for user interaction if a microformat is found. An address could be displayed on a map (e.g. Google maps), a contact could be transferred to the address book, an event could be added to the calendar, or a text could be referenced by an idea. But the impact of social networking is not limited to existing online content and the way it can be found. The SNT publishing initially comprised simple manual tasks making content available online. Posterous³¹ and SlideShare³² demonstrate more advanced methods for the SNT referencing. They upload content in proprietary formats and push it towards Facebook using applications. Posterous scans and categorizes incoming e-mail streams which are converted to feeds or subject-oriented pages. It also supports the SNT grouping via e-mail forwarding. SlideShare provides similar basic services for presentations but adds a premium service called LeadShare³³ that shows an innovative business model based on a SNT. Users who want to download a presentation are asked to

³¹ <http://posterous.com>

³² <http://www.slideshare.net>

³³ <http://www.slideshare.net/business/leadshare>

provide personal information that is sold to the presentation provider. Prices range from \$1 for name, e-mail and company/organization to \$22 for geographic data, phone number, and five custom questions. They provide intelligent references to the uploaded proprietary content that makes them compatible for mashups. But as already mentioned this advantage will diminish as more content will be available in SNT-compatible formats.

Conversion is another value adding SNT that is different from the SNT inheritance because it does not add new information. Evernote³⁴ for example provides optical character recognition (OCR) for uploaded images creating searchable content (SNT finding). Multimedia conversion is another emerging application area where Zamzar³⁵ dominates the market. Users can convert documents, spreadsheets, images, and movies between various proprietary formats without changing the actual content. Figure 18 (Unknown k, 2008) shows a complementary SNT by YouTube that generates subtitles. They recently extended this service by closed captions that go beyond subtitles and include language translations in real-time.

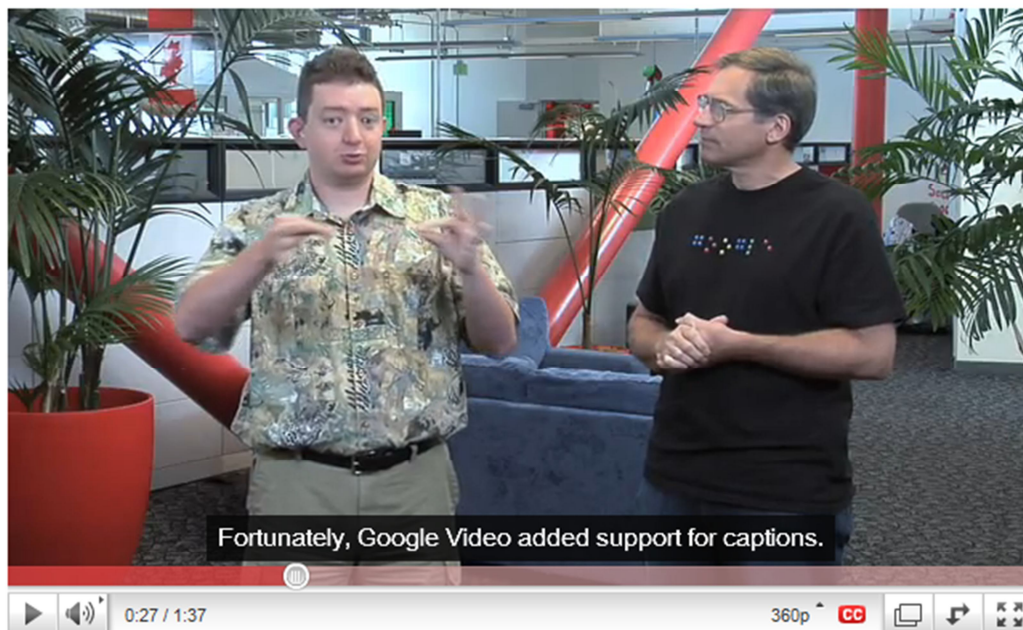


Figure 18: YouTube Closed Captions

³⁴ <http://www.evernote.com>
³⁵ <http://zamzar.com>

Completing is a core competence of a social networking platforms or the (micro-) blogosphere. Alternate solutions like useKit³⁶ are approaching. A toolbar is overlaid to any Website (Figure 19) adding sticky notes, bookmarking, geo-tagging, text cutting and highlighting for users to fulfill SNTs like complementing.



Figure 19: useKit Brower-Toolbar

userEcho³⁷ differentiates from useKit's single user approach by bringing a similar service to groups and communities. Its core competence is management of user feedback (SNT completion) that is divided into ideas, questions, and bugs. The SNTs promoting, classification, composing (i.e. merging feedback and searching for duplicates) and translation complement the service offering that is based on a freemium business model.

getSatisfaction³⁸ and IdeaScale³⁹ offer even more advanced completion SNTs. They seamlessly integrate with Facebook and backend services. Figure 20 (Unknown I, 2010) depicts the IdeaScale widget that can be integrated into existing Web sites. It provides a link to post new ideas and a list of highly ranked existing ideas.

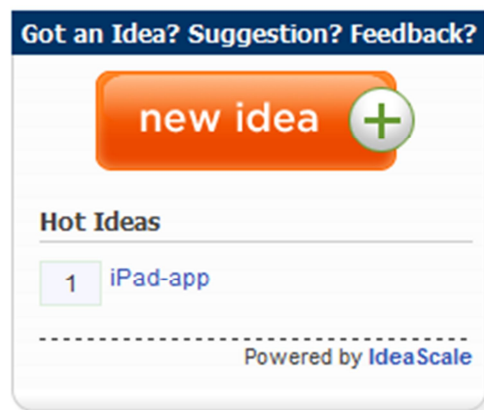


Figure 20: IdeaScale Widget

³⁶ <http://usekit.com>

³⁷ <http://userecho.com>

³⁸ <http://getsatisfaction.com>

³⁹ <http://ideascale.com>

Both solutions provide a good system design that seamlessly integrates with Facebook. Figure 21 (Reitermayer, 2010) shows the Facebook page of my company Viennovate. It has Facebook's look and feel on top of a customized innovation platform that is hosted externally. User votes are synchronized with the IdeaScale platform in the background.

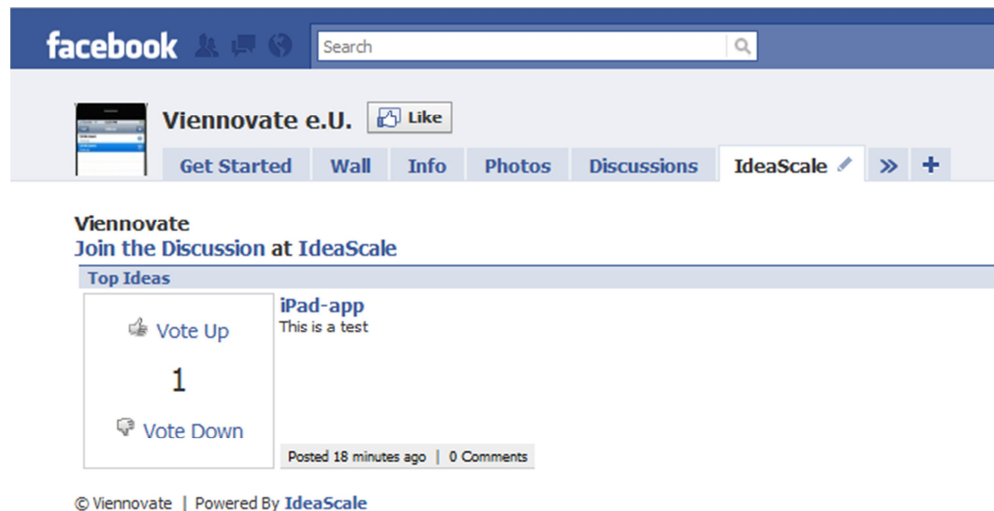


Figure 21: IdeaScale Facebook-integration

Figure 22 (Unknown m, 2010) shows IdeaScale's latest crowd-facing frontend that is available on Apple's mobile platform iOS.

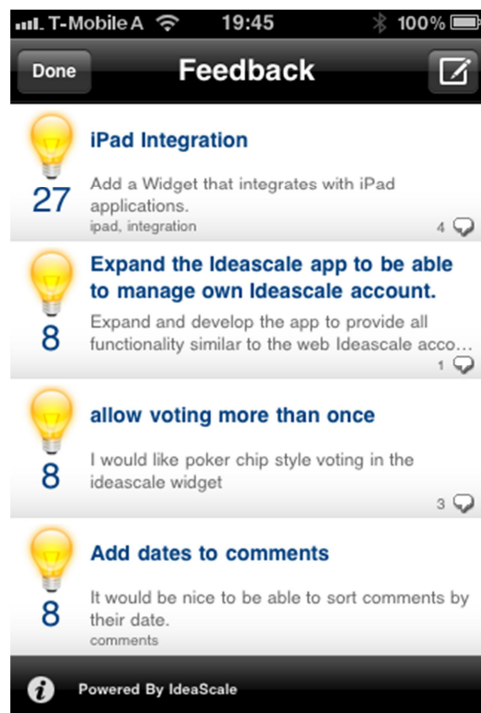


Figure 22: IdeaScale iPhone application

getSatisfaction and IdeaScale implement several Open Innovation relevant SNTs. But both do not support the SNTs inheriting and composing that encourage collaboration across disciplines. Inheritance creates new types based on existing ones. Composition also creates new types but comprises several existing types. An example is online video editing: JayCut⁴⁰, Photoshop⁴¹, Vimeo⁴², YouTube⁴³ enable users to upload videos, add audio (e.g. music) and effects (e.g. transitions between scenes) to compose new multimedia content. An example for inheritance is Flipboard⁴⁴. Figure 23 (Unknown n, 2010) shows Flipboard's iPad application that aggregates social media-content from Facebook and Twitter. Social media aggregation (i.e. composition) equals social network aggregation but this solution also creates a new type - a new kind of "social gossip" magazine. A new user experience based on iPad's native animations and the inverse production process differentiates the solution from competition.

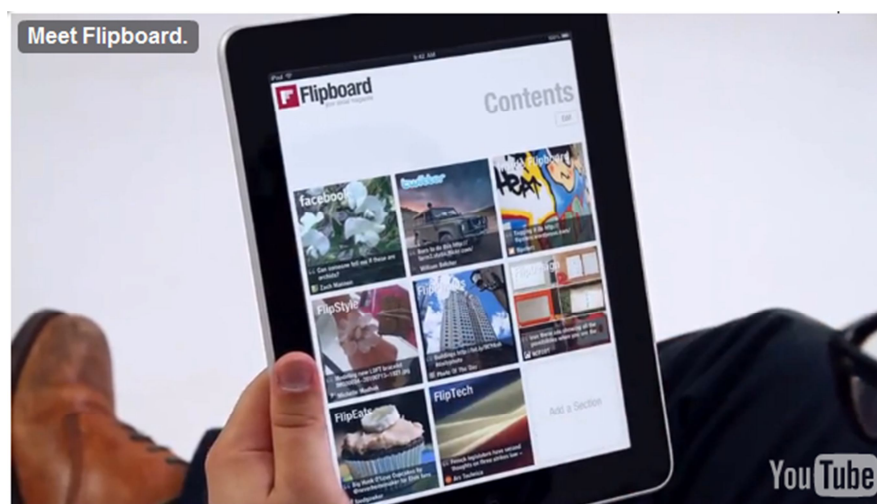


Figure 23: Flipboard - Social Magazine

The success of social media and network aggregation depends on backend services that investigate the social graph and merge results with matching external data. Google's recent acquisitions of Metaweb⁴⁵ and Freebase⁴⁶ (Miller, 2010) are indicators for a new trend: intelligent referencing on the WWW. Both products have a public ontology (i.e. metadata of

⁴⁰ <http://jaycut.com>

⁴¹ <http://www.photoshop.com>

⁴² <http://vimeo.com>

⁴³ <http://www.youtube.com/editor>

⁴⁴ <http://www.flipboard.com>

⁴⁵ <http://www.metaweb.com>

⁴⁶ <http://www.freebase.com>

things) that is maintained by a distributed graph database. Springpad⁴⁷ is demonstrating similar ideas for data entry. Figure 24 (Unknown o, 2010) shows a list of available types that are presented during data entry.

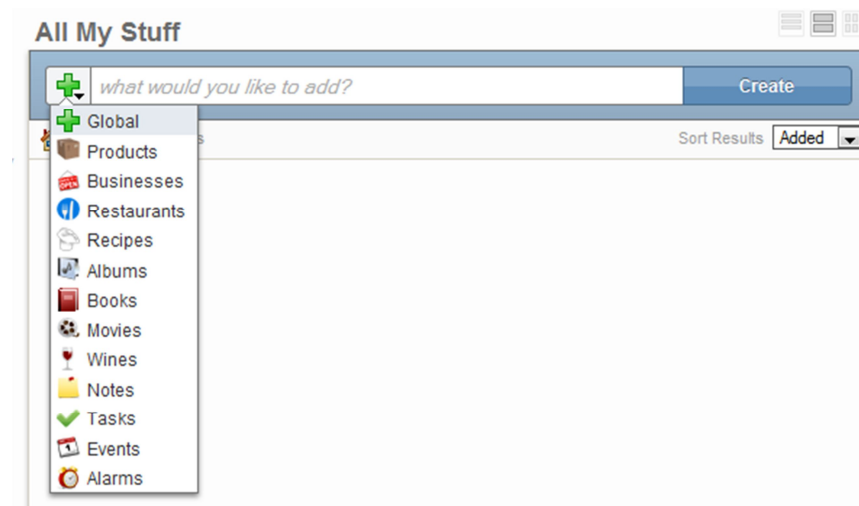


Figure 24: Springpad Data Entry

Knowing the data type in advance is crucial for navigating the social graph efficiently. This implies that collaboration across disciplines has to be based on metadata that is known across disciplines.

4.3 Open Innovation on Social Networks

Pisano and Verganti analyzed collaborations patterns from the innovation perspective. Table 12 (Pisano/Verganti, 2008) depicts their results of applying governance and participation to identify collaboration models for Open Innovation.

Innovation Mall	Innovation Community	Participation	Open
Elite Circles	Consortium		Closed
Governance			
Hierarchical	Flat		

Table 12: Collaboration Models for Open Innovation

Innovation Malls (e.g. Innocentive⁴⁸) follow a generic concept where corporate problem owners request solutions from the global crowd of innovators. Innovation Communities (e.g. any Open Source project) are similar but do not organize themselves in hierarchies.

⁴⁷ <http://springpadit.com>

⁴⁸ <http://www.innocentive.com>

Innovation Malls and Communities share open participation and the derived benefits like the large number of ideas generated and reduced costs of searching. The key requirements for choosing an open model is that problems are small and it must be possible to evaluate proposed solutions at low cost. The authors argue that closed collaboration on the other side is more effective due to the higher likelihood of being chosen (because of the lower number of participants). Closed and hierarchical collaboration is chosen by corporations that have a clear understanding about the problem domain and explicitly aim to limit the number of participants or charge for market entry (e.g. Apple's application store). Elite Circles work similar to generic private collaboration and rely on domain experts. Opinion leaders are known to have some kind of experience and convince the rest of the community to follow their buying advice. The compelling argument empowering these people is that they provide second level support. Consortiums (e.g. IBM blade.org) are different because decisions are made inside a "private club". Problems typically require many participants that share power equally. The authors argue that "Open is not always better than closed, and flat is not always better than hierarchical". They summarize that the right model depends on corporate strategy and the business problem that should be solved by innovation.

I have merged this matrix with the results from the workshops. Governance and leadership have less impact on SNTs compared to participation and privacy. This is due to the fact that most SNTs are based on autonomous participation, self-selection of tasks (Lakhani/Panetta, 2007) and flat hierarchies (swarm model). Innovation communities are therefore the solution space for Open Innovation on social networks. The problem is that innovation malls have a completely different architecture compared with social networks. Innovation malls require user registration and enforce governance and leadership that is not preferred by users (as they said in the workshops). The alternate approach to integrate innovate components into social networking platforms would find higher user acceptance. getSatisfaction and IdeaScale start working on such designs. The important SNTs for collaboration across disciplines that have been identified during the workshops are classification, promoting, referencing, converting, composing and inheriting. The problem of the most important last two SNTs is that they are abstract and complex. Solutions that implement these features are emerging (e.g. Metaweb, Freebase, Springpad). But these solutions are not yet used in the context of Open Innovation.

5 Discussion and Conclusion

Open Innovation and Social Networking are two sides of the same coin. Open Innovation is a business driven concept heading for lasting competitive advantage, sustainable financial success and driver for economic growth. Social Networking might be seen as the other side representing the next Internet revolution since the WWW was launched 20 years ago. I agree with Google CEO Eric Schmidt on the Internet as "...the first thing that humanity has built that humanity doesn't understand, the largest experiment in anarchy that we have ever had". But I also believe in the wisdom of the crowd guiding us to the right topics to learn from. Corporations will be able to benefit from social networking if they manage to move from operational excellence to open minded and innovative collaboration across corporate security domains. Focusing on core competences is an important aspect to survive in highly competitive markets. But collaboration with the outside world will have an increasing impact on finding new application areas, new markets and solutions. If we really want to start thinking in terms of Open Innovation we will have to learn from social networking because it is the way to collaborate with the crowd.

I spent half a year on coding the WWW and iPhone prototypes before I started with workshops and writing on this paper. The key finding from the user feedback is that the crowd does not appreciate proprietary solutions. Users did not like the idea that they should enter ideas for others that are prepared to benefit from them. They also hesitated to register with "just another WWW-based solution". They rather asked for using their Facebook-credentials. The Open Innovation approach has been appreciated. But the idea of innovation communities, idea challenges and one time rewards have not been preferred. The alternate approach integrating innovative features right into social networking platforms like Facebook has been favored. A simplified reframing had the highest acceptance: A Facebook "That's a great idea"-button would be the design of choice. Workshop participants asked for additional tools that would support growing ideas in the context of private communities. They would like to see templates and innovative solutions on social networking platforms that would help them to sell ideas to professional innovation communities, start their own business or simply contribute on ideas they like. I have identified two solutions (getSatisfaction and IdeaScale) that start moving into this direction but just have limited features yet (e.g. voting on ideas).

The SNTs inheritance and composition have been characterized to be most suitable for collaborating across disciplines. A compelling explanation has been given during a workshop: "Every idea needs at least a technical and an economic description". This provides a good starting point for further research on innovation across disciplines because translating ideas is important. If ideas are categorized appropriately and found by members of other disciplines they still might not be understood. Because of this an idea's value proposition has to be understood as multidimensional. Any dimension represents another discipline that speaks a different language. The interesting question is to find a way to encourage a new SNT that would fulfill this need.

Another key finding from the workshop is that there are privacy concerns. A successful Open Innovation solution that is seamlessly integrated into a social networking platform will only gain trust if it can prove that ideas developed by the crowd are not exploited without sharing profits with the crowd. The reason for this argument might be that SNTs are executed voluntarily but are actual work. Any successful innovative collaboration platform will have to find a business model to raise money for lean operations and share profits. The problem in this context is that an equilibrium price for an idea can't be found in advance of market success. By the time something is identified by the crowd to be a good idea it has not entered the generic corporate innovation funnel. The next problem is that many users of social networks would be willing to collaborate innovatively but find current employment contracts to be too restrictive. Most employers claim all rights on any idea of their employees. For most workshop participants this is ridiculous: Corporations encourage Open Innovation and collaboration across disciplines but prevent employees to do so at the same time. So corporations should ask themselves with whom they actually want to collaborate with because the crowd also has to make a living - most of them being employees of other corporations. Existing methods of business competition like B2B or headhunting might not fulfill this requirement.

The impact on theory is a template (chapter 2.2, p.14) for social networking tasks (SNT). I have applied it in workshops and developed a list of actual SNTs (chapter 4.1, p.25). They identify core processes on social networks and investigate how they add value for corporations and individuals. This binary mapping the corporate- to the social networking-worlds could be a good starting point for further research. Second some SNTs (e.g.

inheritance, composition) encourage collaboration across disciplines. It would be very interesting to proof this result with empiric data from a real world solution and understand if detailed metadata that describes the types used in different disciplines would encourage collaboration. Another impact on theory is the importance of risk especially if Internet trends like social networking might fail. What if privacy issues would have a serious impact on future growth? What will be the next wave democratizing the Internet after social networking? Will the crowd following the swarm leadership model react further decentralizing? Would decentralization put social networking into question or create a new kind of collaboration?

The final impact on theory is the importance of content containing semantic uplifts. Although there is a lot of research in this field (e.g. Semantic Web) there is still no dominant design for metadata and usage across disciplines. The questions "if too much metadata would hinder social networking" and "if social networking without metadata would decline" are interesting areas that have a significant impact on Open Innovation on social networking platforms. A technical impact on theory is the impact on database management systems. Today most data is stored in relational databases. I have shown that Google's acquisition of Metaweb and Freebase are signals that indicate change. Relational databases are not the optimal choice for storing a social graph although Facebook is still relying on MySQL. New kinds of cloud-based, distributed, hierarchical and strong type-based databases will find new markets and use cases. I predict that Google will have a major impact on Facebook's future because of its ontology based database acquisition.

Social networking is a driver for new markets that has already influenced adjacent market. The boom of network computers and new kind of mobile computing devices show that social networking is a serious trend. Although this is true for netbook computers the opposite happened with Apple's iPad. It is targeting the social networking market but has been developed on a closed innovation approach.

Finally I want to comment on possible limitations and ask a few simple questions: What if Facebook's IPO would fail? What if Facebook would not go public and raise more capital from existing or new partners? What if Microsoft's monopoly would increase if they extend their investment in Facebook to grow their advertisement business? What if Google's

innovative technological solutions would further strengthen Facebook's market share towards a monopoly? These questions could change social networking into an outstanding success for an Internet-based startup or just another burst bubble. I hope that we have learned our lessons from the dot-com bubble. The quote "You don't get to 500 million friends without making a few enemies" (Munarriz, 2010) brings up a final question about Facebook's future: What would happen with social networking if Facebook would be taken over by a big player on the market that fails to keep up with this spirit?

Although Facebook represents the biggest social networking platform today it is by no means a social network. It is still a startup that has been funded and is looking for profits. The social graph grows the illusion of a democratized Internet that belongs to users. But that is unclear if social networking is going to be successor of the Open Source idea. Is social networking already out of reach of corporate governance? I believe that the ongoing privacy discussion shows that there are several upcoming issues that might threaten social networking. Following swarm-based principles I would assume that Facebook would be decentralized to escape any centralized or business driven regulations. Finally it is also hard to guess what will happen with all the information that has been gathered via the social graph. The Internet has endless memory and "does not forget". How would the crowd react if corporate marketing would leverage this information extensively?

Global acting companies turn business processes into procedures that are predefined, secured by business rules, and exception handled by management approvals. What if this would change social networking into global gossip because we almost unlearn creativity? Is this a threat for Open Innovation or the time for the next big radical innovation to happen? Anyway, my best guess is that it will be based on Open Innovation encouraged by social networking.

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7 Appendices

7.1 WWW-prototype Architecture

The pilot <http://www.viennovate.com/ideas> is running on a server hosted by Bluehost Inc.⁴⁹ located in Utah, USA. The host is powered by multiple CPU-cores and runs CentOS⁵⁰ Unix 64-Bit Kernel 2.6.28.

Security has been given high priority right from the beginning. Communication between WWW-clients and backend services is encrypted using the Secure Sockets Layer (SSL⁵¹) protocol for authentication and user registration. The latter generates strong passwords (14 random characters including symbols) that are distributed via e-mail. Users can change to a non-secure password via the profile-tab but are not advised to do to avoid brute force attacks. The application does not store raw passwords in the database rather MD5⁵²-hash values of a “salted” password. Successful authentication creates user sessions that are protected against common session attacks like session fixation, hijacking, and injection (Ballad & Ballad, 2009). Further server-side hardening is planned. Remote sessions are secured via Secure Shell (SSH⁵³)- and file transfers are secured via SSH File Transfer- (SFTP⁵⁴)- protocols. The domain viennovate.com has been registered with ICAAN⁵⁵ and has been assigned a fixed IP-address (67.20.92.193) to speed up DNS-requests. E-Mails are sent via standard Unix sendmail. Raw content is delivered in XHTML- and UTF-8 format. The graphical layout is rendered in the WWW-browser via Cascading Style Sheets (CSS). User interaction is handled on the client using JavaScript using jQuery and jQuery-UI libraries to provide enhanced GUI-effects (e.g. tabs, accordions). Additional jQuery-Widgets have been included to add special effects (e.g. ratings, tooltips, and ticker). All user interactions are triggered and handled via JavaScript that requests data from backend services using Asynchronous JavaScript and XML (AJAX⁵⁶).

⁴⁹ <http://www.bluehost.com>

⁵⁰ <http://www.centos.org/>

⁵¹ <http://www.ietf.org/>

⁵² <http://tools.ietf.org/html/rfc1321>

⁵³ <http://tools.ietf.org/html/rfc4251>

⁵⁴ <http://tools.ietf.org/html/draft-ietf-secsh-filexfer-13>

⁵⁵ <http://www.icann.org/>

⁵⁶ <http://www.adaptivepath.com/ideas/essays/archives/000385.php>

Table 13 lists the underlying Open-Source based software stack.

Product/Technology	GPL	MIT	Other
CentOS-Unix ⁵⁷	✓		
XHTML and CSS ⁵⁸			
JavaScript ⁵⁹			
jQuery ⁶⁰			
jQuery-UI ⁶¹			
jGrowl ⁶²		✓	
Stars Rating Widget ⁶³	✓	✓	
LiScroll ⁶⁴			
Apache 2.2.15 ⁶⁵			
MySQL 5.1.46 ⁶⁶			
PHP 5.2.13 ⁶⁷			PHP 3.01 ⁶⁸
phpMyAdmin 3.2.4 ⁶⁹			

Table 13: Software Stack

⁵⁷ <http://www.centos.org/>

⁵⁸ <http://www.w3.org/>

⁵⁹ <http://www.ecma-international.org/>

⁶⁰ <http://www.jquery.com>

⁶¹ <http://www.jqueryui.com>

⁶² <http://plugins.jquery.com/project/jGrowl>

⁶³ http://plugins.jquery.com/project/Star_Rating_widget

⁶⁴ <http://plugins.jquery.com/project/liScroll>

⁶⁵ <http://httpd.apache.org/>

⁶⁶ <http://www.mysql.com>

⁶⁷ <http://www.php.net/>

⁶⁸ http://www.php.net/license/3_01.txt

⁶⁹ <http://www.phpmyadmin.net>

Database architecture is based on PHP Data Objects (PDO⁷⁰) building a database independent software layer. Database consistency across transactions is provided by MySQL's database engine InnoDB⁷¹.

Figure 25 illustrates the relational database diagram. The core entities are ideas, (inner) circles, categories, tags, users, and profiles. The other tables are created during database normalization.

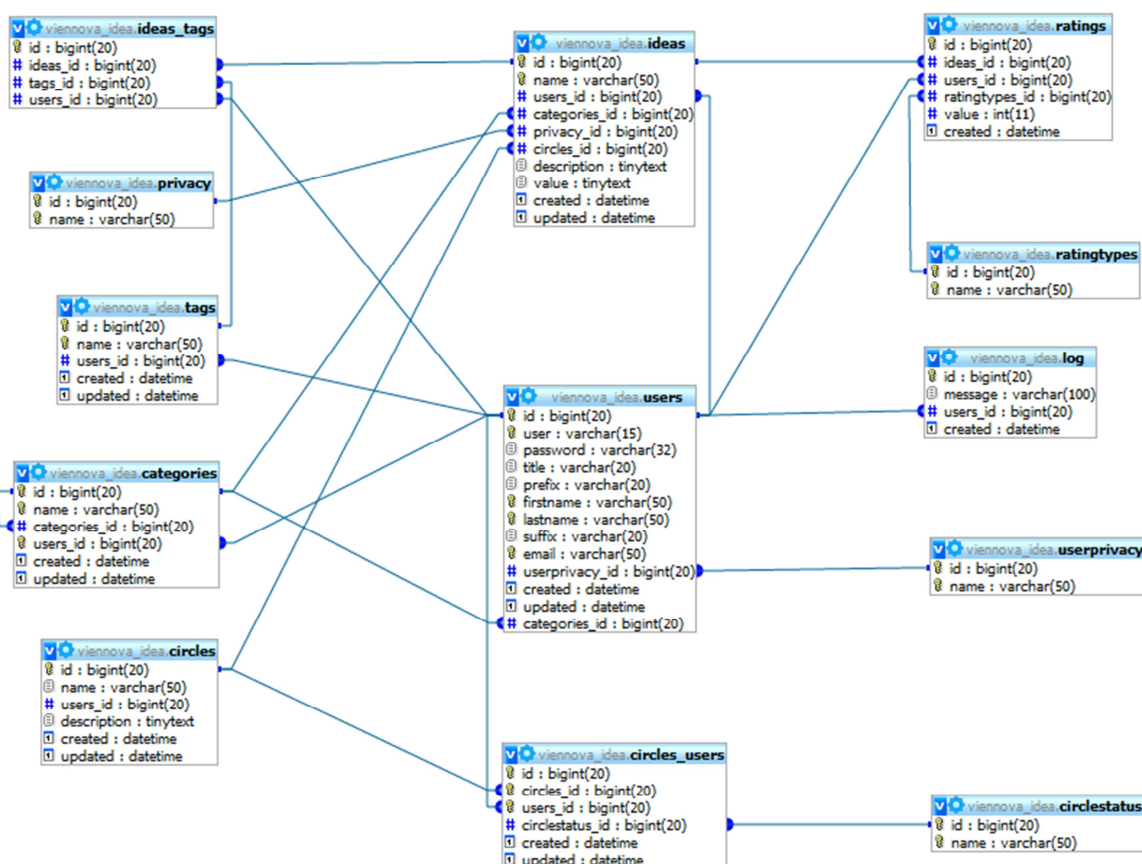


Figure 25: Entity-Relationship Diagram

The pilot has been tested in several beta-releases (Table 14).

Release	Release date
Beta 0.1	May 31 st , 2010
Beta 0.2	June 7 th , 2010

Table 14: Release Dates

⁷⁰ <http://php.net/manual/en/book.pdo.php>

⁷¹ <http://www.innodb.com/>

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