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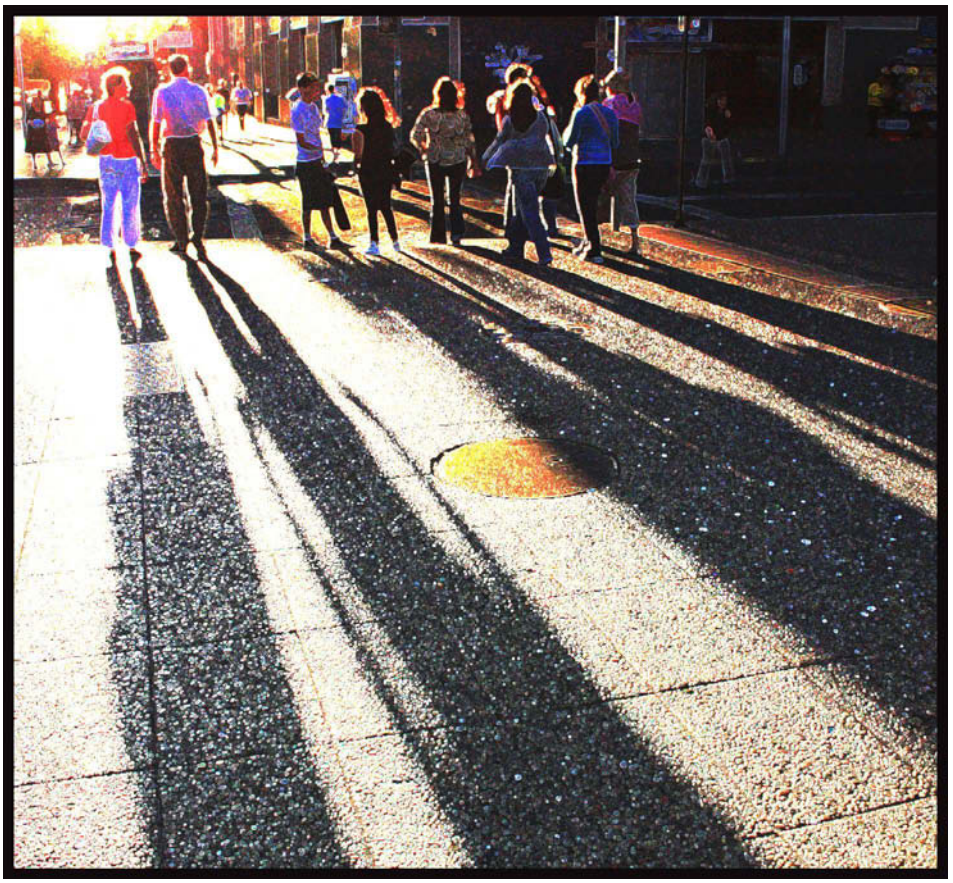

Toni Ahlqvist, Asta Bäck, Minna Halonen & Sirkka Heinonen

Social Media Roadmaps

Exploring the futures triggered by social media

VTT TIEDOTTEITA – RESEARCH NOTES 2454

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tel. växel 020 722 111, fax 020 722 4374

VTT Technical Research Centre of Finland, Vuorimiehentie 3, P.O. Box 1000, FI-02044 VTT, Finland
phone internat. +358 20 722 111, fax +358 20 722 4374

VTT, Vuorimiehentie 3, PL 1000, 02044 VTT
puh. vaihde 020 722 111, faksi 020 722 7052

VTT, Bergsmansvägen 3, PB 1000, 02044 VTT
tel. växel 020 722 111, fax 020 722 7052

VTT Technical Research Centre of Finland, Vuorimiehentie 3, P.O. Box 1000, FI-02044 VTT, Finland
phone internat. +358 20 722 111, fax +358 20 722 7052

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Abstract

Social media refers to a combination of three elements: content, user communities and Web 2.0 technologies. This foresight report presents six roadmaps of the anticipated developments of social media in three themes: society, companies, and local environment. One of the roadmaps, the meta-roadmap, is the synthesis of them all. The society sub-roadmap explores societal participation through communities. There are three sub-roadmaps relating to companies: interacting with companies through communities, social media in work environment, and social media enhanced shopping. The local environment sub-roadmap looks at social media in local environment. The roadmapping process was carried out through two workshops at VTT. The results of the report are crystallized into five main development lines triggered by social media. First development line is transparency referring to its increasing role in society, both with positive and negative consequences. The second development line is the rise of ubiquitous participatory communication model. This refers to an increase of two-directional and community-based interactivity in every field, where it has some added value. The third development is reflexive empowerment. This refers to the role of social media as an enabler of grass-root community collaboration. The fourth development line is the duality personalization/fragmentation vs. mass effects/integration. Personalization /fragmentation emphasises the tailoring of the web services and content. This development is counterweighted by mass effects/integration, like the formation of super-nodes in the web. The fifth development line is the new relations of physical and virtual worlds. This development line highlights the idea that practices induced by social media, e.g. communication, participation, co-creation, feedback and rating, will get more common in daily environment, and that virtual and physical worlds will be more and more interlinked.

Foreword

The emergence of the social media phenomenon has been one of the most remarkable developments in the Internet world during the last few years. Communities formed around Facebook, MySpace, Reunion and their less known counterparts like Orkut, hi5, Bebo or IRC Gallery gather tens of millions of users on a daily basis. YouTube offer means for basically anyone to publish their amusing videos or critical views on societal problems. Wikipedia has all but made traditional encyclopaedias obsolete. Also mobile and ubiquitous location aware social media applications like Twitter and Jaiku are gaining ground, and are becoming part of every day communication.

This kind of phenomenon naturally arouses the interest of both researchers and business people who want to know what is coming and how they should position themselves in the fast moving social media arena.

VTT has seen social media as a relevant research topic both from academic and business points of view. Therefore, VTT chose *Social Media in the crossroads of physical, digital and virtual worlds (SOMED)* project as one of the four strategic ICT projects launched within the Digital World research programme.

This report is a result of the roadmapping and foresighting work done in the SOMED project. The work was carried out in collaboration with researchers from VTT and experts from business world. The report describes possible developments in the field of social media in six roadmaps. The roadmaps are divided into three viewpoints: society, companies and local environment. Each roadmap contains a vision as well as short, medium and long term foresights.

I hope that readers will find this report to be both interesting and useful.

November 2008

Heikki Ailisto
Research Professor,
Leader of the Digital World programme

Executive summary

This report summarises the visions and findings made in two workshops and back-office work relating to the possible futures triggered by social media. Social media has disruption potential to current practices. Companies and organisations that are quick to adopt them stand to win a lot. The report presents a meta-roadmap that captures the most important developments, and thematic sub-roadmaps looking at developments in society and societal participation, companies, and local environment. These results give an excellent starting point for company specific strategic work to explore and identify future directions and opportunities in the field of social media.

The roadmaps consist of three steps: present, short term (1–5 years) and long term (over 5 years). The different aspects of roadmaps include drivers and bottlenecks, user needs, enabling technologies, services and business models. Role of communities is a special feature that is important in connection to social media.

The summarising vision of the future trigged by social media is the following:

Collaborative social media services are widely utilised in societal activities, companies, local environment and private life. This creates increasing transparency in all the spheres of society. Virtual and real worlds will be more integrated into a ubiquitous, communicative media supporting participation and new forms of work and co-creation. Social media creates new business models as well as changes traditional ways of doing business by enabling customers to be involved more and more in company processes.

In the present, the most important *driver* for social media is *the wide availability of free and easy to use services applications*, and the basic human need for creating and maintaining contacts with other people. These tools contribute to the so-called network effect, which means that new ideas spread very quickly. Critical present *bottlenecks* relate to the lack of trust and stickiness of the old practices. Old practices refer to societal institutions, like legislation, and also to old habits that slower the creation and adoption of new business models and, therefore, critical mass.

The current *role of communities* is to be communication and discussion platforms, but also a way of collecting and sharing information and knowledge. Present *services* include discussion forums, rating and recommendation services, and platforms for sharing content and for networking and communication. There are also aggregation and mash-up services building on available content from various sources, including users, companies and authorities. Present social media *business models* rely heavily on advertising with the promise of free content and services. Companies aim at utilising user networks that are viral marketing channels. Peer production, and user-driven

companies have emerged; first attempts are being made at utilising crowd-sourcing. Also, the company is sometimes thought of as a wiki, e.g. a kind of collaboration platform. Existing companies are increasingly starting to realise the possibilities and the power of social media and build their own online communities. In brand communities customers discuss, share ideas and help each other.

In mid-term, more and more people have become web citizens that have their "home locations" on the web, and carry out many of their daily tasks on the web. They are proficient at utilising available personalisation and customisation features, and collecting information from various sources. The network effect thus becomes even more prominent.

Spam, such as low value and misleading content, viruses and various forms of security and privacy threats, like organised cyber-attacks, will remain and increase in importance as *bottlenecks*. Semantic web technologies are gradually taking their place as a key *enabling technology*. Mobile web access is the norm, when needed. Portable profiles are commonly utilised, and users get more control over how information about their preferences and behaviour is utilised. Data mining lifts the analytical power of the platforms. The *user needs* emphasise on flexible, device-independent networking opportunities. Controlling one's visibility and privacy in the web and virtual worlds are a user concern and need.

Communities will be utilised also more by companies. The most important ways to utilise communities are as a feedback and reviewing pools, but more and more also as trust-based networks in R&D. Communities will form an important knowledge and talent pool for companies. Communities also enable companies to have dialogue with their customers and to strengthen their relationships with customers. Communities evolve from ideation channels towards ubiquitous innovation environments.

Services are based on easy opt-in/opt-out mechanisms. They will be increasingly personalized and profiled and utilise collaborative and collective intelligence. Open innovation paradigm is prevalent and intelligent talent pools offer services for companies. Aggregation and mash-up services, local information services, location bookmarking and browsing and applications with micro-participation opportunities are booming. New *business models* are emerging and many of these are based on crowd-sourcing. Revenue sharing is another popular model, but in order to realise its full potential new technical solutions for payment processes are needed. Thus advertising and free will remain important business models. The metaphor of the company as a wiki is adopted.

In the long-term, the most important new *driver* is the ubiquitously accessible contents and services. The web citizenship is a commonly understood principle of personalization and portable profiling. Network effect will reach to new heights with new analytical possibilities brought e.g. by semantic web applications.

Technological convergence is the leading principle of *enabling technologies* in the long-term. Displays with community access will be common in physical environments. New solutions and services based on augmented reality and wearable user interfaces are emerging. Especially wearable applications enable new ubiquitous and constantly mobile functioning of social media. These displays utilise sensor technologies and multisensory data. Data mining will be widely utilised in analysing communities and user networks and community contents. Users emphasise contextualization and localization of the information. Also, device-dependence will lessen intensively and the needs to control visibility and privacy will enhance.

Communities play a key role in working and collaborating in the companies. Communities have become ubiquitous multi-actor networks, work swarms. These swarms create flexible, thin organizations that either act within a traditional company or as an extension to it. Instead of traditional advertising and mass marketing, personalised marketing and dialogue and relationships with customers are more valued.

Services are built on utilising collaborative intelligence and context-awareness. Virtual personal assistants are an integral part of new services. New social media *business models* will be based on intelligent talent pooling and thin organizations. These thin organizations offer modular just-in-time services that are based on dynamic resource management. Networked resources will be available to quickly set up and test a business idea, and if successful, scale the business up quickly.

Five main development lines that are triggered by social media applications were identified.

1. **Transparency.** The transparency of activities is a key feature in social media and it will be expected in other areas as well. Transparency is important for companies, and they have to adapt to the imperative of transparency and make sure that their brand promise matches the reality. Public administration faces similar expectations. Information about successes and malpractices spreads quickly through multiple social media channels. Also individuals are faced with ubiquitous transparency: things presented in virtual spaces are not easily erased and privacy narrows. The authenticity of things will be valued even more by consumers in the future, and the increased transparency makes it possible for people to check it.

2. **Rise of ubiquitous participatory communication model.** The social media induced interactive communication culture spreads to new application areas. Newspapers, urban spaces and television will all be supplemented with interactive, value-adding applications. This is the rise of ubiquitous participatory communication model and media, which will also be increasingly utilised in work related activities.

3. **Reflexive empowerment.** The rise of social media increases the empowerment of the citizens and customers. Empowerment through social media is mostly reflexive, i.e. it is usually based on a specific issue and temporary coalitions that engage in dialogue on the topical issue. Reflexivity, or adaptivity, is based on virtual mob effects, on the power of crowds and distributed networks. Social media induces new kinds of political and economic practices that are not based on the traditional political map. The efficacy of the activities relies on the network effect and the utilisation of open and voluntary peer participation.

4. **Personalization/fragmentation vs. mass effects/integration.** The dialectic of fragmentation and integration is the key tension in the utilisation of social media. Practices and services in the web can be tailored and personalized to almost every detail with the help of portable profiles. Networked communication lets information percolate through multiple channels. This forms a fruitful field for personal creative activity and identifying weak signals. Open innovation is becoming a shared practice in firms and organisations and it also feeds the network effects enabled by social media. Social media opens vast potential also for enormous mass effects and integration. Rapidly created and dissolved one cause movements and utilisation of global pools of amateurs are examples of this. Super-nodes raise the cumulative consequences of the network effect to another level.

5. **New relations of physical and virtual worlds.** The fifth development line is the new relations between physical worlds, i.e. daily activity environment of the people, and virtual worlds. Practices induced by social media, e.g. communication, participation, co-creation, feedback and rating, get more common in daily environment. The cityscapes will be flooded with screens. These devices will support multi-directional communication – users can give feedback or leave their "footprints" or "fingerprints" either with mobile phones or direct contact with the device. More and more activities can be globally shared and monitored in real-time. Virtual worlds will be entangled in the practices of daily environment in new ways. Some common practices of the virtual worlds, like logging into a service or personalising services, may also become common practices in the physical world.

Contents

1. Introduction

The SOMED project (Social Media in the crossroads of physical, digital and virtual worlds) at VTT Technical Research Centre of Finland aims at supporting the development of user-friendly and value-adding applications that are needed in the digital everyday of technology-mediated communities. The SOMED project was launched in the autumn 2006 to be concluded in autumn 2008.

A foresight approach has been integrated to the SOMED project right from its beginning. It means in this case probing future perspectives of social media from technical, societal and business points of view. Before this study, the approach has been realized by identifying weak signals of future digital user cultures (Ahlqvist et al. 2007b) and by analysing the phenomenon and core elements of social media by means of expert interviews (Heinonen & Halonen 2007). This report presents roadmaps of the anticipated developments of social media in the future digital world. The report is the third and the last volume in a series of SOMED Foresight Reports and it builds up a continuum on the basis of the two previously mentioned foresight reports.

The roadmaps presented in this report were constructed by emphasising the following three criteria. Firstly, roadmaps are *visionary socio-technical roadmaps*, i.e. they are constructed to combine examinations on societal and technological issues in relation to explicitly stated visions of the future (see Ahlqvist et al. 2007a: 86–87). The idea is that the combined elements of the roadmaps have a strong potential to produce the outcomes that each vision presents. Roadmaps strive to describe meaningful relations and potential causalities between the technological and societal issues mainly from the viewpoints of companies, R&D actors (research institutes, universities), governmental actors and non-governmental actors. However, it should be mentioned that the roadmaps are not intended to be deterministic pictures of the futures, i.e. we do not assume in advance that any of the visions or roadmap explorations presented in this report will be realized as such. Thus the likely future development will include some elements that are presented in these roadmaps, but there will also be new and surprising elements that obviously could not be taken into account when creating these roadmaps.

The second criterion for the social media roadmaps was to characterize social media development paths and possibilities in three themes: *society, companies and local environment*. The themes of the roadmaps are quite wide and this also sets some limits to the applicability of the roadmaps. Roadmaps presented here should not be read like product roadmaps or action plans, i.e. as presentations of definite causal structures and temporal paths to realize some concrete goals. These roadmaps describe some of the key *transformations and elements in transition* in each theme. Therefore, roadmaps should be approached as kinds of strategic tools for creating deeper understanding of and

setting agendas for the utilization of social media applications in thematic areas of society, companies and local environment. Thirdly, the roadmaps are outcomes of the expert workshop process and core group iterations. The roadmaps are therefore *crystallizations of the views of a group of experts* (see Appendix 1) that were collected in a systematic process and re-worked by the core group of the project.

The pivotal research questions of the social media roadmapping project can be formulated as:

1. What are the most important transformations in the thematic areas of society, companies and local environment?
2. Which roadmap levels are they affecting? The roadmap levels are: drivers; bottlenecks; enabling technologies; user needs; role of communities; services; and business models.
3. What kind of temporal sequences do these identified transformations form? The temporal levels of the roadmaps are: present (current state-of-the-art activities), midterm (1–5 years) and longterm (over 5 years).

The report presents six sub-roadmaps under the themes of society, companies and local environment. The report also presents a meta-roadmap combining and synthesizing the most important results of the sub-roadmaps. Special focus is laid on the role of communities, since it is considered to be the most important factor in the development of social media.

The roadmapping process was carried out through two workshops, in collaboration with VTT experts and external partners, and further elaborated by the core team (Appendix 1). The process itself is described in this report. A short summary of the knowledge generated during the two years of the SOMED project is produced by discussing the essence and the meaning of social media from diverse perspectives. Finally, we present syntheses and conclusions of the social media roadmaps. Furthermore, we suggest five general development lines that are triggered and catalyzed by the increasing utilization of social media applications and collaborative practices in all spheres of society.

2. Social media: definitions and trends

2.1 What is social media?

There have been many efforts to define social media. Our definition of social media is built on three key elements: content, communities and Web 2.0[1] (Figure 1). Content refers to user created content which may be of very different types; it may be photos, pictures or videos, but also presence information, tags, reviews and play-lists to mention some examples of this wide choice of input that people may create and publish on the web.

The emphasis of the term is in its first word, social. Creating and uploading content and participating become interesting when there are other people doing the same thing. The social nature of activities brings us to a second aspect of the term, communities. Social media typically lets people communicate either directly – which has been common on the internet since early days – or via media objects. This was made possible during the last eight years when digital cameras and video cameras, camera phones and broadband connections became widely available and created new kind of opportunities for communication. The term social is well motivated in the name of this phenomenon, because a lot of value is seen in interpersonal communication. This is expressed in value proposals of different services and seen in the large amount of person-to-person communication within services.

The development of digital technologies for content creation and sharing, together with web technologies and applications that let people easily participate on the internet are the third corner stone, and we call it Web 2.0. Sometimes, this term is used to refer to the whole phenomenon of social media, but here we use it to summarise the technical aspect (Figure 1). Without the technology, people and content could not meet to the same extent. As a functional definition, social media refers to the interaction of people and also to creating, sharing, exchanging and commenting contents in virtual communities and networks (see Toivonen 2007).

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[1] Originally, Tim O'Reilly came up with the term "Web 2.0" in 2004 to describe a new phase of the web development and, also, to create appeal of "newness" to the conference he boasted (O'Reilly 2005; Scholz 2008; Allen 2008). Scholz (2008) critiques the term Web 2.0 for being created solely for market purposes and uses the term "social web" instead.

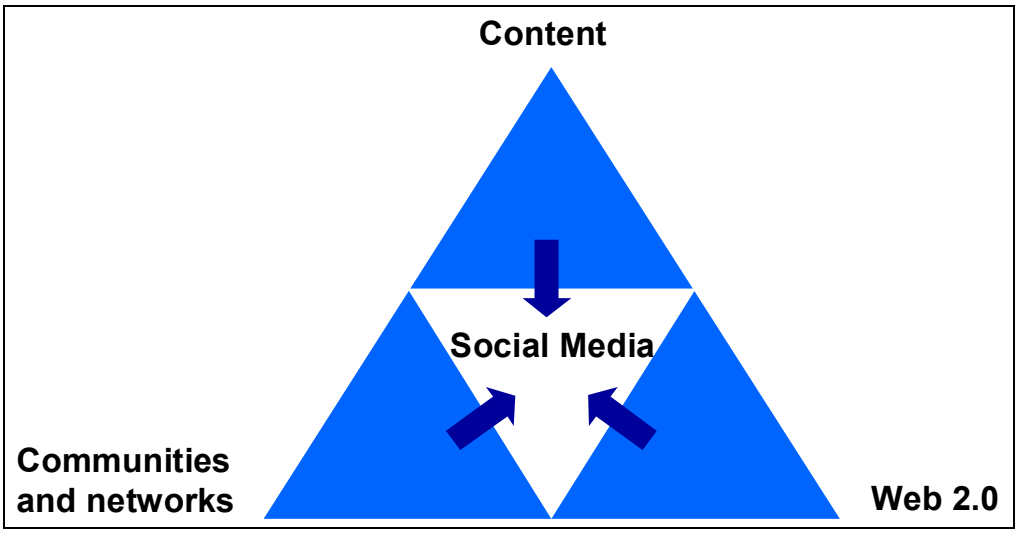

Figure 1. Social media triangle.

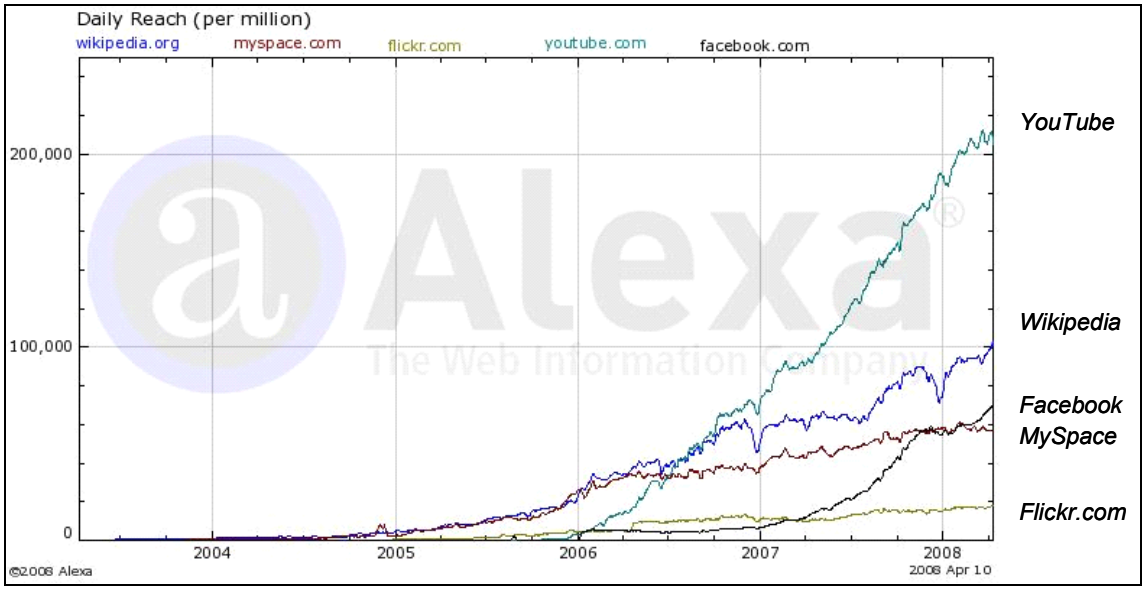

Figure 2. The daily reach of most popular social media applications: YouTube, Wikipedia, Facebook, MySpace and Flickr.

The year 2006 can be regarded as the break-through year of social media. At that point, the popular early applications like Wikipedia and MySpace had gathered significant numbers of users, while Facebook and YouTube had been introduced to the public. Furthermore, social media applications were gaining popularity in an unseen speed – YouTube since early 2006 and Facebook since early 2007 after it opened its doors to anybody to register. The popular applications presented in Figure 2 represent different types of applications: Wikipedia collaborative knowledge creation in the form of an open encyclopaedia, MySpace and Facebook social networking, and Flickr and YouTube content sharing of photos, pictures and videos.

2.2 Social media from user perspective

What makes social media so interesting to hundreds of thousands of people? We have dug deeper into the phenomenon of social media in a former Somed project report (Heinonen & Halonen 2007). As a result of that study, we presented a hand as a metaphor of digital society. After all digital is the way we have always been: the word digit comes from the digits of the hand (in Latin finger is digitus). Digits of the hand have always been used to create, to make tools, to communicate, to sign language, to shake hands, to touch – so we have always been digital. The core themes behind the phenomenon of social media are presented in the following as a "digital hand" in which each finger represents a core theme and the palm of the hand represents the capacity resulting from the five fingers (Figure 3).

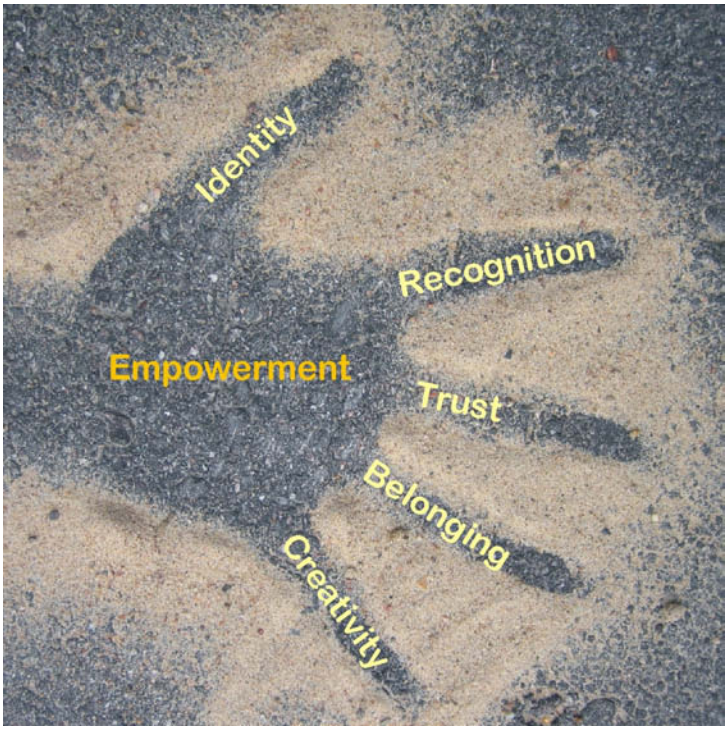

Figure 3. Hand as a metaphor of digital society (Heinonen & Halonen 2007).

The thumb represents identity. Our identity as human beings is closely related to the media we use. Social media is a multidimensional tool for expressing one's identity to the outer world. One big question is how clearly we can perceive our own identity in the combination of physical, digital and virtual worlds.

The index finger represents recognition. By recognition we mean all positive feedback that an individual receives from being connected to a community. Peer esteem is especially important incentive in participating and generating content. Social media actually is about mutual recognition.

The middle finger represents trust. Trust is a crucial ingredient in all human communication. Trust is not self-evident in normal physical life, not to mention entering digital sphere. However, it has a growing importance as a factor of attraction for entering new networks or for remaining loyal to the existing ones.

The ring finger represents belonging. Belonging includes access, motivation and skills to connect to various networks and communities. Continuity and implications of being connected determine in the long run whether you experience true belonging. Time is limited and in huge digital space you always have to make choices which networks and communities to attend. On the other hand, digital life enables synchronous connectivity to various networks simultaneously. Ambiguity of communication is an obligatory companion in belonging and connectivity.

The little finger represents creativity. Creativity is much about the individual. A single person can have her or his voice heard and creativity easily expressed through social media. However, with social media collective creativity can also be boosted. Playfulness, randomness and combinations and remix of things, ideas, persons and networks are essential in evoking creativity.

All the fingers of our digital hand together form the basis of the emerging empowerment of the individual – the central palm of digital hand. The ideal case is that all the fingers contribute to such empowerment to a sufficient degree. Naturally, in reality all fingers are not balanced and there is a great variation according to individual's background, priorities, contexts and life situations. Using the digital hand means concrete participation in digital life.

2.3 Social media from business perspective

As part of the Somed project, we have looked at the business opportunities of social media. Figure 4 shows a categorisation of the business opportunities. It identifies four main categories: *core* (1), *enabler* (2), *feature* (4) and *built-on* (4). The above mentioned applications excluding Wikipedia can be categorised as *core* (1) social media applications: the content and activity relies totally on users and the revenues are gathered directly relating to this activity.

The term *enabler* (2) refers to using social media practices and processes to accomplish a process or function within a business. Also here social interaction is often important, but it is not the *raison d'etre* of the application. Wikipedia is a good example of using social media as an enabler: the aim is to create an encyclopaedia, and the means to do it is to utilise the collective wisdom and contributions of Web users. Many companies

have adopted social media in their innovation and product development process: the easy to use tools and the ICT-based opportunities for communication and co-creation have resulted in new ways of getting product ideas and feedback from users and other people interested in the matter.

Various kinds of web sites have recently adopted some social media features into their websites. For example, many news services let people rate and recommend news. Furthermore, some even let users set up profile pages in order to give people a more visible role in commenting and promoting news. However, the main service has not been changed, and we categorise this way of using social media as a *feature* (3).

Social media has also created indirect business opportunities. Here we use the term *built-on* (4) referring to the fact that these applications would not be possible, or they would not be needed, if there weren't this huge interest and amount of user-created content. Three different sub-groups can be found here:

- *Tools and services for creating social media applications* (4a). Companies and even individuals can use these tools to build rapidly a new application or feature. An excellent example is Google AdSense, which makes it possible for even private persons to include ads and generate revenues from their website.
- *Tool or service built on social media content* (4b). These services can aggregate and search content, as Technorati does.[2] Mash-ups fall into this category.
- *Social media as a delivery channel* (4c). Open APIs have made it possible to reach people who participate in social media and social networking services in particular. Social networking services are becoming a new media channel and an operating opportunity for smaller players.

These different opportunity areas are important to keep in mind both when thinking about new business opportunities, and, like in this case, making roadmaps of future developments that social media will open either directly or indirectly.

Without going too much into details relating to business models, one aspect worth mentioning here in giving the overall view of social media and its business opportunities, is the "free" business model. The internet as a whole – and social media in particular – has a strong tradition of being free for the end-users. In social media applications, it is important that the application gathers critical mass of users to make the site interesting and lively. This means that it must be very easy for people to join

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[2] An interesting study on the content producers themselves – profiles of bloggers – was also recently published, giving insight into the "blogging mind". State of the Blogosphere 2008 Report. http://technorati.com/blogging/state-of-the-blogosphere/

and start using the site, which is in strong conflict with entry or subscription fees. The business model of free requires that companies must experiment with new models and also that revenues are gathered in multiple ways.

The most common business model is advertising, where social media has some opportunities: people tell a lot about themselves and their interests, so information is available to precise targeting. Another challenge is to get people to notice and react to advertising. Some services have been able to introduce additional services that people are willing to pay for, even though it is possible to use the basic features for free, so the subscription business model is not totally dead in the social media world either. Another important area for revenues is commissions: the service acts as the trusted mediator for transactions or sells items and gets a share of the revenues. See "Google Ads…" for more detailed discussion on business models (Kangas et al. 2007).

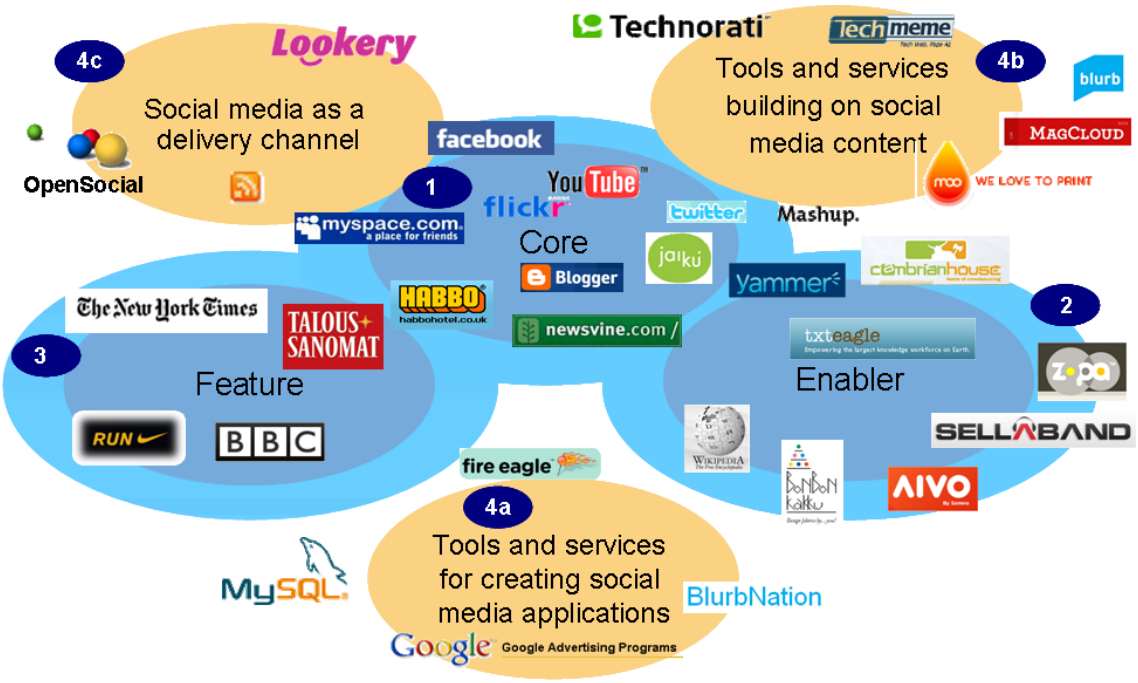

Figure 4. Social media business opportunities.

Social media is in many areas changing the rules of any business that can be carried out online. Many people have become members of various social media sites, and also participate in various ways in online activities. Here are some key findings of a Pew/Internet study made at the end of 2007 about teens and social media in USA [reference, http://www.pewinternet.org/pdfs/PIP_Teens_Social_Media_Final.pdf].

- Some 93% of teens use the internet, and more of them than ever are treating it as a venue for social interaction – a place where they can share creations, tell stories, and interact with others.

- 64% of online teens aged 12–17 have participated in one or more among a wide range of content-creating activities on the internet.
- 39% of online teens share their own artistic creations online, such as artwork, photos, stories, or videos.
- 28% have created their own online journal or blog.
- 27% maintain their own personal webpage.
- 26% remix content they find online into their own creations, up from 19% in 2004.
- 55% of online teens ages 12–17 have created a profile on a social networking site such as Facebook or MySpace.
- 47% of online teens have uploaded photos where others can see them, though many restrict access to the photos in some way; and 14% of online teens have posted videos online.

This is an indication of where social media is developing.

The buzz about social media is often very optimistic and positive, but in addition to challenges relating to business models, other concerns have also been raised. First Monday, an online journal, recently published an issue focusing on critical perspectives on Web 2.0.[3] Web 2.0 also embodies a set of unintended consequences, including increased flow of personal information across networks, diffusion of one's identity across fractured spaces, emergence of powerful tools for peer surveillance, exploitation of free labour for commercial gain, and fear of increased corporatisation of online social and collaborative spaces and outputs. In the First Monday's article collection Scholz (2008) argues that Web 2.0 is based on market ideology and professional elitism. Basically, O'Reilly's (2005) original idea was based on an effort to dynamise the web discussion and to create a sense of "newness" after the slump that was continuing from the start of new millennium. As Scholz (2008) notes, the most intriguing questions of the social media are springing from its double-sidedness. From the one hand, virtual worlds created in the server farms kept up by multinationals can provide free playgrounds and options for users, but they also monetize on the creativity of the users that have made the worlds lively and thus interesting to more people. The same can be said for crowd-sourcing and collaborative product planning: even though consumer feels empowered, the corporations will reap the benefits.

[3] http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/issue/view/263/showToc

3. Building the social media roadmaps

This chapter presents the roadmapping process, which consisted of two workshops and back-office work. The aim of the first workshop was to elaborate and brainstorm on the key issues of social media in about five year time-span. The focus was in particular at those phenomena connected to social media that have the potential to change the practices of communities, of communication and of working.

The starting questions for the workshop were the following:

1. How will new products and services be developed?
2. What kind of new community and organization forms are developing?
3. How will firms be communicating with their potential customers?
4. What new forms of work are evolving?
5. How will we act on the things we consider important in local and global scales?
6. How will we know what interesting is taking place around us?
7. How will we communicate with people near and far?
8. How will we spend our free time – entertainment, hobbies, voluntary work?
9. How will social media be visible in the physical world?

The first step of the process was the evaluation and elaboration of drivers and bottlenecks. It was completed as a working pair dialogue. The pair voted on the most important drivers of social media and elaborated these drivers. Then the results were combined and first conclusions were made as a group. After this first phase, the participants were split into three groups that started to work on three different topic areas: innovation processes and organizational forms (1), consumers and business (2) and lifestyles and interaction (3). The first group (innovation processes and organizational forms) dealt with the questions 1 and 2 in the list above, and it emphasised the roles of new networks and evolving network actors. In addition, the first group also considered the potential transformations induced by the social media applications in the more traditional industries, e.g. forest and metal industries. The second group (consumers and business) considered the questions from 3 to 5. The third group (lifestyles and interaction) considered the questions 6 to 9.

The main target of the group work was to fill roadmap matrices on the three topic areas. The task was to find two or three more focused viewpoints within the topic areas. When these viewpoints were decided, they were discussed via the roadmap matrix. The matrix included a description of the theme, preliminary vision for the theme and four topics on a three level timescale. The topics were: 1) most important consumer applications, 2) most important business or company applications, 3) societal and/or technological drivers and 4) societal and/or technological blockers.

The key results of the first workshop can be synthesized into the following observations. In the innovation processes and organizational forms (1) group, there were several important discussion topics. The first one was distributed working and as a practical example of it, microblogging systems for the forest industry were discussed. The discussion accentuated on-site learning environments that could be utilised for microlevel real-time information transfer. This system could combine real-time time information from sawmills to trucks. It is thus a networking technology. Also, pictures and visualizations, e.g. with a mobile phone, could be connected to the information flow to give an impression of the quality of raw materials. The second topic considered the challenges of the corporate culture in the face of social media developments. The discussion touched upon the need and challenge of transparency, utilisation of wikies in the corporate communication and generations gaps in the technology adoption. The third important wider topic was communities of trust. The discussion addressed the questions of the roles of the communities in the innovation processes and R&D. Customer communities, rewarding practices and usage of fake identities were discussed.

In the second group, consumers and business (2), the workshop discussions highlighted the empowerment of the consumers and the different ways of utilising feedback and reviews in business development. The concept of product development arena as a platform to connect consumer and business developers was discussed intensively. In the emerging internet of things, the product development arena could be integrated into the products. Also, a user profile working across different systems was elaborated on. The second discussion topic emphasised the combination of virtual and real-time time on-site information. In the near future, information shared in social media applications will be widely connected to the physical world. This brings new kinds of opportunities e.g. by empowering local producers. Third topic was networked entrepreneurship and the roles of social media applications in this.

In the third group, lifestyles and interaction (3), the discussion focused on the societal aspects of the social media. There were three wider topics in the discussion. The first one was social media as a catalyst for participation. The most important points in the discussion were the impacts of the small thematic communities and the flexibility between work and leisure. The second topic was the cultural transformation induced by social media. The points made were the centrality of communication, increasing number of channels and technologies and increased monitoring. Other discussion themes were transparency, participation, reciprocity, customisation and societal effects of real-time information. The third topic was changes in business environment. Free services, levels of customerships, companies as potential hosts for thematic communities – e.g. brand communities, product arenas, product showrooms – and service packaging were discussed. Also social media entrepreneurship was touched upon, especially through potential new professions, like “professional bloggers”, “professional raters” and “professional reviewers”.

As an evaluation of the outcomes it can be concluded that the assessment of drivers worked well. However, the discussion on topic areas opened to somewhat different directions than was expected by the researchers. As a whole, it seemed that topic areas were quite hard to differentiate from one another. Rather than identifying topic areas that could be characterized unambiguously, the discussion identified larger integrative themes and small nuances in the topic areas. The integrative themes identified in the groups were the increasing transparency, communities of trust and utilisation of multichannel dialogue techniques in the active citizenship and business activities. Therefore, it was decided that topic areas should be faded into the background and potential applications should be emphasised in the second workshop.

After the first workshop, the research group of the project made quite a lot of back-office work to create roadmap templates from the discussion matrices. Seven roadmap templates were created, and five of them are presented in this report: (1) societal participation through communities, (2) interacting with corporations through communities, (3) social media in work environment, (4) social media enhanced shopping, and (5) social media in local environment. In the second workshop, the first task was to review and verify the roadmap templates. The aim was to sharpen the crucial elements in the roadmaps and crystallize the most important connections between the different roadmap elements. This was done in the form of quite straight-forward questions: Does the roadmap vision depict a plausible and potential future? Has the roadmap enough future orientation? Does it depict the most important challenges of the future? Are the elements of the roadmaps most important for the topic? What are the strengths and weaknesses of the roadmap?

The aim was to form a consensus of the development lines presented in the roadmap templates. The second task was to produce application examples in the topic areas of the roadmap templates. The idea was to brainstorm and iterate on the services, functions and spaces that could exist in the future depicted by the roadmap template and its vision. It was also mentioned that the applications could be service oriented, technology oriented or business oriented. The material and elements produced in the above-mentioned process were then crystallized and visualized in the form of roadmaps. These roadmaps were further iterated by the core group in back-office work and also by gathering comments from additional experts, such as the SOMED project's management and steering groups.

4. Social media meta-roadmap

4.1 Roadmap structure in the report

Social media roadmaps were constructed in a workshop process that consisted of two workshops (see previous chapter). The roadmap structure is presented in Figure 5. At the top of the hierarchy is the meta-roadmap that is the synthesis of the thematic sub-roadmaps. It summarizes the key findings of this report. The meta-roadmap gathers the main development trends as the project group could see them on the basis of the work done in workshops.

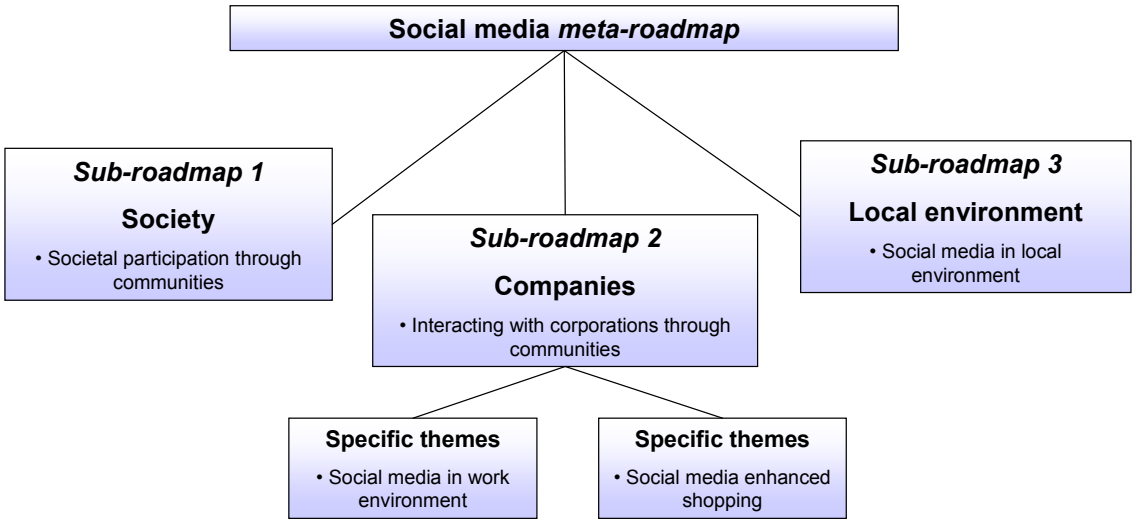

Figure 5. Social media roadmap structure.

The sub-roadmaps are thematic. The first thematic level is "society". It includes one roadmap, *societal participation through communities*, and special application examples. The second thematic level is companies. This level includes three more detailed roadmaps. The first is *interacting with companies through communities* that can be approached as a general outlook on the new ways of communicating and transacting with social media tools. Thematic level "companies" includes also more special roadmaps on *social media applications in work environment* and *social media enhanced shopping*. Application examples are also presented in this theme. The third thematic level is "local environment" there is one roadmap: *social media in local environment*.

4.2 Background to the meta-roadmap

In this chapter we form a synthesising view to the drivers, bottlenecks, and enabling technologies, user needs and role of communities affecting the future development in connection to social media.

4.2.1 Drivers

As a starting phase of the roadmapping process, the main drivers influencing the development of social media were considered and evaluated during the roadmapping process. The drivers can be identified in six fields: societal and cultural change, business and clients, science technology and innovation, sustainable development, work life, and markets. Some of the drivers overlap two or more fields of interest. The classification and the descriptions of the twelve main drivers are illustrated in Table 1.

Changing cultural environment, networking and aging are considered the most important drivers in the field of societal and cultural change. The increasing importance and volume of bottom-up approach in society is clearly expressed through the evolution of communities and virtual places. The channels of social media can be utilised in influencing political issues at national or international level. The intersecting and overlapping networks of business, work and private life find a fertile substrate in social media communities. Aged people can be considered both as a challenge and a driver for social media. Old habits die hard, but they can still benefit of new tools. The need for social interaction or help in home can be resolved at least in part by the new services offered by social media. Aged as well as disabled people need most clear and adaptable interfaces, which might delight the mainstream users as well.

Commercial and customer orientation, segmented needs of diverse customer sectors and outsourcing are the main drivers in the field of business and clients. The applications and services of social media can answer to many needs of business life such as requirement of transparency, strengthening of the dialogue between businesses and clients, paying attention to individual customers' needs, gathering and utilisation of feedback as well as involvement of clients in product/services development.

In the field of science, technology and innovation, the main drivers are accessibility and development of technology. Technology is an important enabler and the accessibility to technology could be considered an everyman's right. Nevertheless, this right is not everyday life to the most of the world's people. At a global level, the expansion of accessibility of technology from industrial countries to developing countries will create new behavioural models, innovations and interaction of a major impact. In countries

already covered by a wide accessibility and availability of technology, the nosedive of prices (hardware, software, telecommunication networks), increasing technology literacy and ubiquitous computing will widen the user base of social media and deepen its impacts.

Environmental challenges as well as social responsibility and sustainable development are considered the main drivers in the field of sustainable development. It is important to bear in mind all four aspects of sustainable development: ecological, social, cultural and economic. In front of urgent environmental challenges new operation models and attitudes are needed, and social media is seen as a bottom-up channel of citizen activity in environmental issues. The same goes for overall sustainable development and social responsibility issues at local citizen networks and communities.

In the field of work life, human resources and outsourcing embody the main drivers of social media. The working life is getting more and more fragmented. Employers require ready accessibility of human resources to changing demands of know-how. As a result of the changing working life, every employee has to be an entrepreneur at some level. Young people's attitudes towards work and working environment differ from the past ones. For them stability is not a value, and work is not tied to a certain place or time. New working models, such as international telework, are becoming common practices. Outsourcing or subcontracting takes place and as a result crowd sourcing (also without guidance) gets easier and working when needed (ad hoc) becomes common. The means of social media can be highly valued by the demands of the changing working life.

International markets and competition is the main driver in the field of interest related to markets. International competition is characterised by intense dynamic. The demand of language skills, communication capacity and cultural understanding are the main impacts of internationalisation. Also remigration of outsourcing, e.g. Indian investors landing in Europe, was identified as an impact of deepening of the international markets.

Other, more specific, drivers related to social media were also identified during the roadmapping process: single households, long-distance friendships and hobbies, global communities of interest, importance of brands, viral marketing, opportunity to have publicity through communities, and demand for expertise.

Table 1. The twelve most important drivers and their impacts described by the participants of the workshop I.

	Driver	Impact
Societal and cultural change	Changing cultural environment	• political influencing • ”eco-lobbing” • cultural changes influence work life
	Networking	• businesses go from individual to relationship based intimacy • ever more extensive services will form global services • subcontracting • potential resources of businesses are considerable and create an increasing demand for tools
	Aging	• extended working age • phased retirement process • new forms of home help services (virtual communities) • need for clear and adaptable interfaces • participation in networks fulfils social needs
Business and clients	Commercial and customer orientation	• market orientation • implementing social media in new business sectors • customers require transparency from businesses • clients participate in product development • strengthening of the dialogue between businesses and clients, paying attention to customers’ needs • mass customisation • productisation of customisation • client-product-model • individual customisation of products and services • feedback, flexibility • role of communities
	Segmented needs of diverse customer sectors	• all customers can not be served individually
Science, technology and innovations	Accessibility of technology	• nosedive of prices (hardware, software, telecommunication networks) create major availability and accessibility • increasing technology literacy • ubiquitous computing • expansion of geographical dimension from industrial countries to developing countries will create new behavioural models, innovations, interaction • everyman's right
	Development of technology	• technology as an enabler • compatibility, standardisation • wireless connection to items
Sustainable development	Environmental challenges	• eco-travelling • rationalisation and reduce of travelling and commuting (car sharing) • social media as a channel of citizen activity in environmental issues (bottom-up) • energy generation and saving both for price and CO^2 emissions • restrictions, resistance • new operation models, attitudes
	Social responsibility and sustainable development	• social media as a new bottom-up communication channel in all fields of sustainable development (ecological, economic, cultural and social including ethical) cf. Swedish teenagers’ tsunami crisis website (lunarstorm.se) • strict laws • attitude change • copyright

Work life	Human resources	• fragmentary working life • young people's attitudes towards work and working environment: stability is not a value, work is not tied to place or time • new working models: international telework, short temporary employment, combining temporary employments • ready accessibility of human resources to changing demands (varying demand of know-how) • networks • subcontracting • atypical employments e.g. call centre workers • incidence of demand and supply of labour • everybody has to be an entrepreneur at some level
	Outsourcing (subcontracting)	• scattered working models • crowd sourcing (also without guidance) gets easier • working when needed (ad hoc)
Markets	International markets and competition	• dynamics • remigration of outsourcing: Indian investors in Europe • language skills and communication capacity • cultural understanding

In the first workshop 24 drivers were elaborated and put in order of importance. The resulting twelve most important drivers are illustrated in Figure 6.

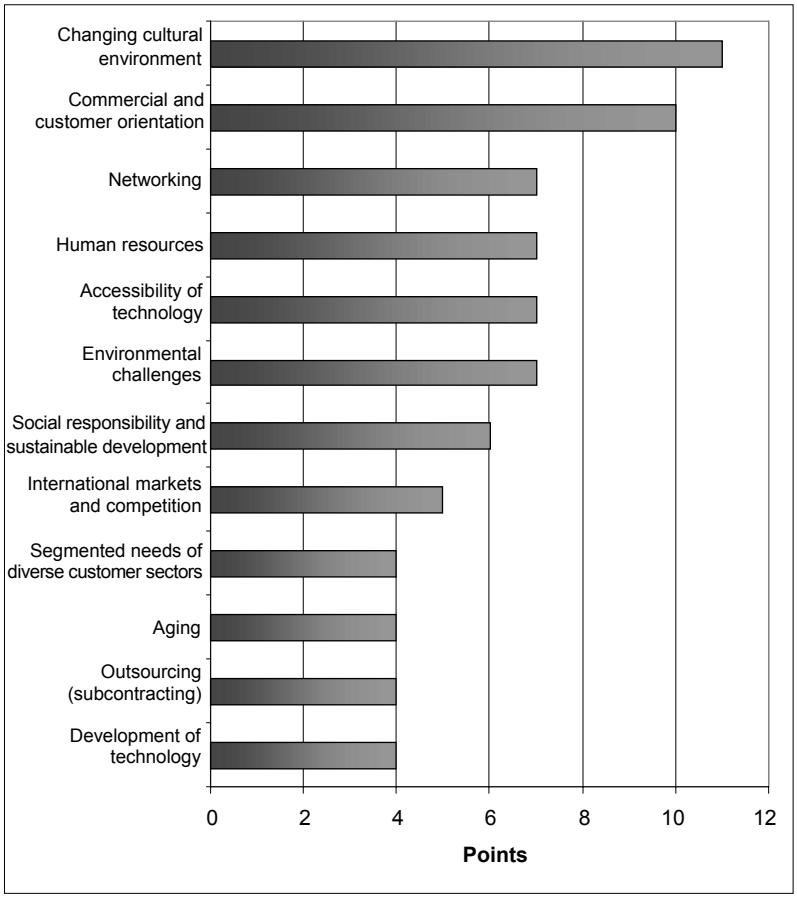

Figure 6. The evaluation result of the main drivers influencing the development of social media.

4.2.2 Enabling technologies

We approach the enabling technologies of social media from three points of view: creating content, consuming content, and creating and offering applications. Social media in its current form became possible owing to important developments in all these areas. The development has been intensive in the last few years, and this is likely to continue in the next coming years. Another important issue to notice is that creating and consuming are not any more separate activities. Instead, it is possible to switch between these two roles, which is partly explained with the wide available technologies that are easy to use and support participation from the user side as well. Collaboration may mean contributing with new content or it can be smaller input and expressions of opinions, like ratings and tags. However, over time and with cumulating numbers of users, also these small contributions become significant resources.

As already mentioned, digital devices for capturing photos and videos have become available to most consumers in the developed countries. Also the prices of broadband connections have come down to levels that let people spend a lot of time online and also upload and download large files. The prices and capacity of mobile internet connections have been less favourable to the users, but this issue is getting increasing attention. A big issue is how the available frequencies will be commercialised, and who will get the ownership. Big internet companies like Google and Yahoo are making moves to get important position in the future of wireless internet access, where the potential for growth is seen.[4]

The variety of devices that can be used to convert pieces of their lives into digital format is huge. Music, audio, TV, videos, photos – all kinds of content can be stored and packed into small devices that can be carried along. Content can also be shared on the internet very easily. At homes, large and high quality displays and screens are being used to enjoy media in the lay-back mode. And also, we expect that electronic reading devices, like Kindle, will gain popularity among users.

The nature of content has become more varied. It is not only traditional content, like text and videos, but also a lot of small fragmented information, such as presence information and brief comments, called microblogging. Location information will become available more commonly, which means that digital information will more and more often contain spatial components, like co-ordinate information. Location information gives a lot of opportunities for location-based services and more efficient

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[4] The dominant position of Google as a search engine is not yet threatened. However, for example German, French and Japanese governments are planning to fund heavily search-engine research efforts. The third-generation search engines would go beyond matching your exact query words and seek to get a sense of what you are looking for and come up with the best pages based on an understanding of their content. (Freedman 2007)

management of digital information. People could utilise content that has been created by their peers, and not by media companies and organisations. This means that the competition of consumers' time and attention will become fiercer.

We can expect to see further development in the ways people communicate utilising information and communication systems. Future devices will make it possible to have multimodal ways of interaction. Mobile phones will support connecting to information systems with the help of printed or RFID codes, and with the help of NFC technology. Social media started as a web phenomenon, but we will be witnessing it becoming more visible also in physical world and interaction.

There has been a lot of discussion about user created applications being the next step after user created content. Some tools have already been introduced such as Yahoo!Pipes and MicroSoft's Popfly. Facebook has made applications an important part of user experience, and made the concept of "applications" familiar to large numbers of users. More tools will be developed for users to create and adapt functionalities for themselves. These developments pave the way for user created applications as well.

To summarise, at the consumer end we expect to see more and more options in creating and consuming digital media and in connecting to the internet for communication and media consumption. The trend of more capacity and features with smaller costs can be expected to continue in this area.

More challenges can be seen in other aspects of using social media applications. Users are afraid of private or confidential information ending up in wrong hands, identity thefts, are confused or overwhelmed with information sources and possibly flooded with spam and advertising. Another important challenge relates to the amount of noise and spam in social media applications. Since the barrier to entry is low, it is inevitable that there will be a lot of content that is of low value. There may also be content that is created on purpose to lead users' opinions to certain directions. For example, when users' reviews and ratings are used in making recommendations, some benefits could be gained by spreading misleading information – either to harm competitors or to promote own products and services.

Social media processes themselves can be utilised to pinpoint items of value in these large amounts of user created content, and also otherwise, where user ratings and reviews matter. In the near future, a lot of research is focusing on the ways to automatically extract more information of the user inputs. Information about social networks, e.g. pinpointing individuals whose opinions are noticed and influence others, is part of this work. Using recommendations became widely known in Amazon web bookstore. Amazon's recommendation algorithm analyses customer browsing and purchase data and often it successfully recommends related items. Recommendation algorithms and features are also being developed in different areas.

Web resources (Amazon S3, more recently Google) are offered so that it is possible to create applications without large up-front investments in hardware, and if the application becomes possible, more storage space can be bought flexibly as needed. This makes it possible to enter the market with smaller risk, thus levelling the field for new entrants.

The technical opportunities for developing compelling applications are already good and still improving. For example, Ajax and Flash enable the easy creation of applications that are entertaining to use. People have already learned to expect a lot from the usability the applications, and the comparison is made to the best applications in the world. Many successful social media applications are essentially simple and, for that reason, fun to use. We expect that fun and easy will remain important features also in the future.

Web is increasingly becoming a place where communication and transactions are carried out and people act as themselves. There is talk about webizens – new kind of web citizens who treat web as their second home turf. During the last two or three years, social networking has gained a lot of popularity on the net. There are popular applications that concentrate on social networking and others make it possible to build permanent and visible network connections with other people. People are increasingly acting as themselves, because web is less and less seen as something out of the ordinary, but instead it is seen as everyday practice of communicating and connecting. Connections made in the web are often extended with real life connections, and vice versa. Another aspect changing our lives is that people may have active contacts and communication with people living very far, and possibly never meeting them face-to-face.

Virtual worlds are still mainly used only in games. Second Life, the best known virtual world for non-gaming is still a marginal phenomenon (see Ondrejka 2007; Evans 2007). Investments are, however, being made in virtual world by companies like IBM. Virtual worlds enable richer communication than web page and text-based interaction. They have a lot of potential for becoming the stage for many kinds of applications, e.g. for interpersonal communication and for consumer tasks, like online shopping. Also, even though people still like to act behind a pseudonym, they want to have more or less permanent web personalities. People put a lot of effort on creating personal website to express themselves and virtual worlds let people represent themselves as avatars.

From the technical point of view, management of multiple usernames and passwords is a challenge because users tend to be quite lazy to register into new applications. Additionally, in social media applications the need connect with other people is usually primary, so in addition to user's own personal information, also information about one's friends and contacts should be added. There have been some initiatives earlier to make it possible to use same user ID to log into several applications. During early 2008, it seems that OpenID initiative, together with related OAuth, are getting more widespread support.

We expect this development to continue. There is a clear need for these types of solutions, because people find using and managing several username and passwords cumbersome.

OpenID and OAuth are part of a wider movement, Dataportability, which aims at making it possible for users to manage and control their own data. Now, user data is stored in different systems and users hardly know what information is stored about their behaviour in systems. Currently, users cannot decide how the data is to be used. The OpenSocial initiative, launched by Google, can be regarded as being part of this development. It aims at opening access to user data, and user networks in particular and using this information in other applications.

Many services on the web get a significant portion if not all of their income from advertising. In advertising, the key issue is to show well targeted advertisements. This requires information about each person's interests, and a large pool of advertisements, from which to choose the most relevant ones. Google has become the leading company in advertising business: search terms are clear indications of people's interests and give good opportunities for effective targeting. We will see a lot of activities relating to ways of capturing information about user interests, arguments about who owns that kind of data and what kind of user data can legally be captured and utilised.

It can be stated that there will be more dimensions to networking and connectedness on the internet. Web pages are created out of content that is gathered from multiple sources. The previously mentioned advertisements are one example, and many applications have interfaces that let external applications access their data. Mash-ups gather data from different sources and typically visualise it on a map. One important enabler has have been resources like Google and Yahoo Maps, which can be utilised for visualising data. There are other open resources, like Wikipedia and its semantic version, dBPedia, and geonames for location information which are important building blocks for future applications.

Another enabler for networked and distributed applications are feeds. Feeds became useful in connection to blogs, because blogs are updated irregularly. Feeds are now commonly offered by many types of services and this gives users the freedom to choose and easily access those information sources that they find most interesting. Feeds have, however, remained relatively unknown to the public in large. We expect this to change as there will be more support for receiving and utilising them. Widgets are small applications that can be copy-pasted on personal web pages, like into blogs and profile pages. They are like windows to remote services, and are another step into the direction of distributed applications on the web.

Semantic web technologies are maturing, and finding their way into applications. As already mentioned, there are efforts under way to build semantic web resources, which

are important in adding intelligence into applications. In addition to the previously mentioned DBpedia, we can mention FreeBase, which aims at gathering knowledge in semantic format with the help of web users. For example, Ankolekar et al. (2008) present scenario for the application of semantic web technologies in enhancing the present social media tools. In this scenario a blogger could flexibly reuse data from the web, and blogging could apply dynamic data sources and personalization. Semantic web would thus be "an ecosystem of entities" that create, share and reuse the web metadata (Ankolekar et al. 2008: 73).

Another approach in adding semantics to the web is the use of microformats and RDFa. These solutions make it possible to add semantic information into normal web pages: the information is presented as normal HTML pages to users, but the page contains information in a structured way, and it can thus be picked up and processed by applications. Several microformats have been developed, such as for events and names, and currently many event applications offer event information with the help of microformats. Many information publishers and general public have not yet become aware of these, but we expect this to change as more applications where microformatted content can easily be utilised become available.

4.3 Meta-roadmap

VISION

Collaborative social media services are widely utilised in societal activities, companies, local environment and private life. This creates increasing transparency in all the spheres of society. Virtual and real worlds will be more integrated into a ubiquitous, communicative media supporting participation and new forms of work and co-creation. Social media creates new business models as well as changes traditional ways of doing business by enabling customers to be involved more and more in company processes.

Present

Drivers. The most important drivers of the present start are widely available and easy to use applications. An important driver from the user perspective is the need to get recognition and a response from the peer-crowd, and to keep up with friends and acquaintances globally. On the business application side, there is a need for tools for efficient and global network management, especially for the management of distributed work and communities. The adoption of social media is also driven by the growing importance of ecological and ethical values – social media applications can change the communication and travelling routines e.g. by reducing the need of face to face

meetings. This development also emphasises the growing importance of time as a critical resource. As a result of the intensification of the network effect, ideas spread fast in interlinked communities. This development leads also to the formation of super-nodes that are very densely connected.

Bottlenecks. Trust was raised as the key bottleneck in the present world of social media. Trust is mingled with many issues in the social media. Generally, in order to utilise social media applications, one should trust the presented information and the members of the communities that are producing it. Trust is also linked to identity management – users need to be sure that their identities are not abused, contorted or information spread to third parties without consent. Trust is a particularly important issue when the activating the ageing population to adopt the new services. Another bottleneck is the stickiness of the old habits. This refers to the power of traditional media interfaces and individual preferences that may limit the adoption and utilisation of opportunities of new communication channels. Legislation may be a critical bottleneck that blocks the application of new innovations. On the business model side the lack of other business models than advertising is a bottleneck. Also, there is not enough critical mass – users, developers, companies, organizations – contributing to production. Already at present, one sees the increase of spam, like ads, noise and misleading information, and emergence of viruses in social media services. There are growing needs for easy applications, especially with different user groups such as ageing population. The problem is that easy-to-use applications are particularly demanding to develop. A general problem at the current stage is that there are vast amounts of content, but content is not contextualized at all or the contextualization is done poorly.

Enabling technologies. The most important current enabling technologies of social media are blogs, wikies, and discussion platforms, as well as various services relating to sharing various types of content. Also web technologies supporting ease of giving feedback e.g. rating and commenting are already utilised widely. Social networking services (SNS) are popular particularly among young generations. The utilisation of cartography and geoinformatics, geo-coded information presented on maps, is in the use and rising hastily. Applications offer rich user interfaces (AJAX) and mobile broadband. Also APIs are quite common present enabling technologies.

User needs. Learning to know new people, communicating, hearing other people's opinions and experiences are basic human needs, and social media gives new tools to fulfilling these needs. People also have various creative ambitions and social media give stage to present these creations to the world. Some people use the social media applications to have an impact on the surrounding world and this empowerment is important.

Role of communities. Communities take different forms in social media. Communities are often formed informally over time when people connect to others with similar interests and ambitions, and co-operation may be made without any or with only little formal structure. Members shift towards the core of the community if they have a longer time interest in the community topic or just benefit from results of the contributions of the community. Communities may share and work on information, digital media or even real life objects. Communities provide means to give feedback and thus act as reviewing channels.

Services. Present services are the following: discussion forums, recommendations and alerts, and other types of platforms for media enhanced communication. There are also aggregation and mash-up services. Services are typically user-driven, which means that word of mouth, user rating and recommendations are used as process to pinpoint interesting items. Services based on tracking user behaviour offer easy opt-in/opt-out mechanisms.

Business models. Present business models rely heavily on advertising, which is the most common business model. Content and services are offered for free and the income is collected via advertising or in combination to other services and sales that can be boosted with free service. Also viral marketing is utilised. Peer production has emerged as new business model. Some innovative firms utilise crowd-sourcing. Also, the company itself could be thought of as a wiki kind of collaboration platform. This thinking, if it becomes more common and widely applied, could open doors for new business models.

Mid-term (1–5 years)

Drivers. There is no big change in the drivers in mid-term. Web citizenship is emerging. More and more people have become web citizens that have their "home locations" on the web, and carry out many and get support for their daily tasks on the web. They are proficient at utilising available personalisation and customisation features, and collecting information out of various sources. There is increasing need for managing personal digital media content over the internet in connection to and personalising services. Ubiquitous access to content and services over the internet is a strong driver.

Bottlenecks. The identified new bottleneck in the mid-term is the anticipated counter reaction to social media bloat. A growing cognitive load may pose a bottleneck and counter reactions to social media applications. The top hype is over, early adopters find other new applications and gadgets, but the great majority is widely using social media applications. In mid-term, the problem of spam and viruses still increases in social media services. There is too much advertising, and very commercially emphasised content, too much noise and misleading information. Also the questions of privacy and fear of personal information abuse, like identity thefts and stalking, will be high on the agenda.

Enabling technologies. The most important emerging enabling technologies are semantics, i.e. microformats, semantic databases, for example DBbedia and Freebase. Portable profiles and general data portability are more widely supported. Cheap data storages will be crucial resources in enabling the user content and information accessible via internet. Social media applications are widely utilised via mobile broadband. Mobile technologies and location information will be increasingly used in applications. Therefore, easy user interaction with mobile devices will be needed. There might also be new special devices for connecting to the web. Feeds (RSS, Atom) will be familiar to mainstream users. Many social media applications utilise data mining, like social network analysis, sentiment analysis and analysis of content in services in order to understand better what is happening in the applications and to be able to improve the service with advanced features like well functioning recommendations.

User needs. The user needs emphasise a shift from device-dependency to flexible networking. Personalisation and mobile sharing of experiences will be rising user needs. Users are more and more used to having continuous updates on and access to the information that they want to keep up with and consume media as and where needed. Content may be traditional content, messages from family and friends and some of the content and information is created automatically with the help of sensors. Controlling one's visibility and privacy are emerging user needs as well.

Role of communities. Companies will increasingly utilise communities in their business development. It is pivotal to apply communities as feedback and reviewing pools, but also as trust-based networks to back up research, development and innovation activities. Communities will form an important knowledge and talent pool for companies. Communities will thus evolve from ideation channels towards ubiquitous innovation environments.

Services. Services in the mid-term will be based on easy opt-in/opt-out mechanisms. There are services that turn ecological and ethical choices into visible reputation and status. These profiles and reputation can be carried across the services. Services will be increasingly personalised and apply collaborative intelligence. Intelligent aggregation, mash-up and alerting services will be created to support managing information overflow and helping to keep up-to-date on relevant issues. Local information services, like location bookmarking, help in selecting services and connecting to other people. Various kinds of micro-participation opportunities will be offered.

Business models. There will be new used-driven business models including various forms of crowd-sourcing. Advertising and free will remain important. A common metaphor for a company will be a wiki, i.e. a flat, collaborative and self-organising network. The rising business model in the communities will be revenue sharing. Intelligent talent pooling will become important community business model.

Long-term (over 5 years)

Drivers. In the long-term, the new driver will be the ubiquitously accessible and thus device-independent contents and services.

Bottlenecks. Bottlenecks presented in present and mid-term will most likely increase their effects also in the long-term.

Enabling technologies. Semantic web technologies are exceedingly utilised in the long-term. Different kinds of displays are applied in homes and public spaces. New solutions and services based on augmented reality and wearable user interfaces will be used. Especially wearable applications enable new ubiquitous and constantly mobile functioning of social media. Mobile devices will have improved usability, screens and longer battery life. The gadgetry will utilise multi-sensory interfaces and sensor data. New kinds of interfaces utilising multi-sensory information become common in the information systems. The integration of TV, virtual worlds, games and social media channels will become a general "mass interface" for logging into the net. Also, sensor data will be widely utilised as a basis for the information system. Data mining is commonly utilised and helps in utilising and understanding information that is being created in social media supported applications.

User needs. New user needs in long-term will emphasise contextualization and localization of the information. Also, device-orientation will decrease intensively and the needs to control visibility and privacy will enhance.

Role of communities. Communities play a key role in working and collaborating in the companies. Communities have become ubiquitous multi-actor networks that can be utilised as talent pools and test-labs for ideation and refining of innovations. One could call these networks work swarms. These swarms form flexible, thin organizations that can act either within a traditional company or as an extension of a company. It could also be a company of its own based on e.g. revenue sharing.

Services. Services are built on collaborative intelligence and context-awareness. Virtual personal service-independent assistants are an important part of the new services. The development towards thin and agile organizations creates many opportunities for service providers. Services may be offered at very granular level, and companies my scale up or down quickly in response to demand.

Business models. Business models will be based on intelligent talent pooling and thin organizations. These thin organizations can offer modular, just-in-time services that are based on dynamic resource management.

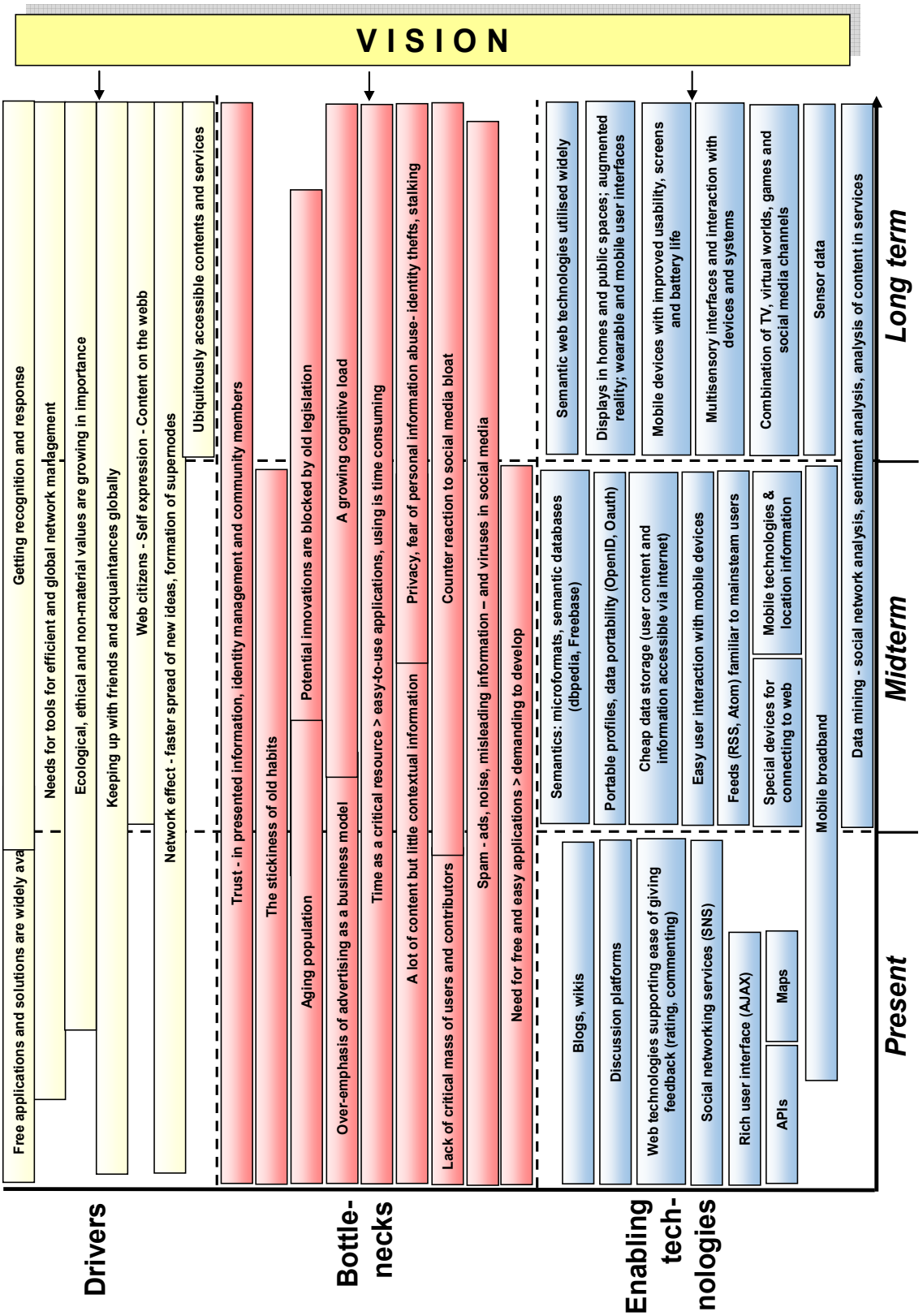

Figure 7. Social Media Meta-roadmap: drivers, bottlenecks and enabling technologies.

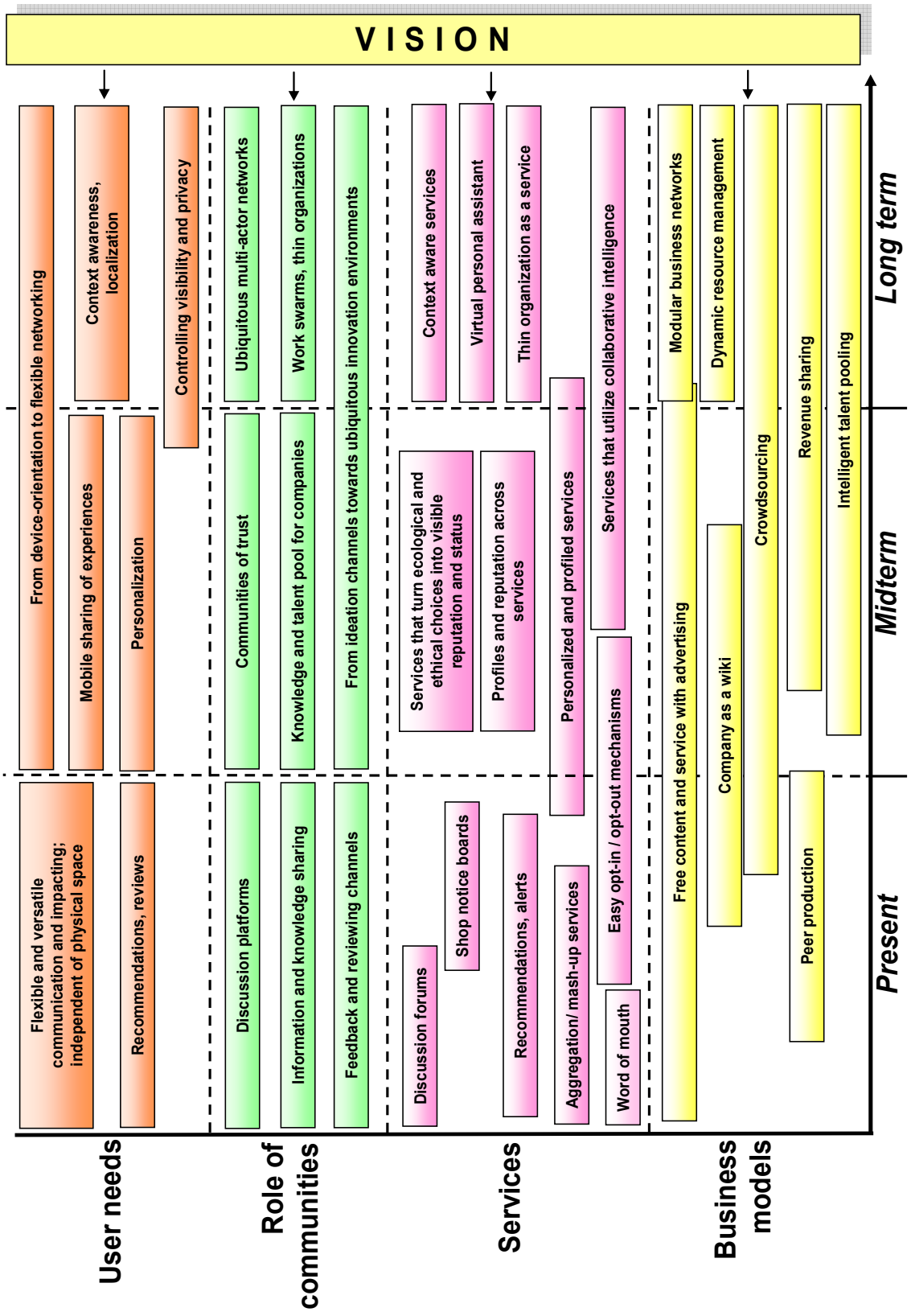

Figure 8. Social media meta-roadmap: user needs, communities, services and business models.

5. Social media sub-roadmaps

5.1 Society

5.1.1 Societal aspects of social media

The first thematic level of social media roadmaps is society. In this level, we highlight the changing nature of societal participation that is triggered by the emergence of social media driven user communities. The main societal driver of the increasing participation through communities is the enhancing citizen activity in the grass-root level of society.

New participatory internet enables more combinatory and substance-based political approaches. For example, Finnish information society expert Kari A. Hintikka (2008: 69) gives the following description of the politics in the information networks:

> Political activity developing in information networks creatively combines established right-wing–left-wing party programs and raises new substance matters to the front. Simultaneously it emphasises openness and expertness of the people – open politics where everybody can revise e.g. party program in the Internet whenever one wants and has time. Activities aim towards transparency and basically anybody interested can have direct influence to the coalition core processes.

As Hintikka (2008: 69) describes, citing Vegh (2003), political activity utilising Internet can be categorized into two main types: those activities that utilise Internet to boost the influence (*hactivism*) and those activities that are solely based on the Internet. These activities also breed new political parties, like Piratpartiet in Sweden or Wiki Party and Finnish Information Society Party in Finland. Traditional political parties are also increasingly utilising social media channels. It should be noted that Internet based political activities do not necessarily require party structure, since net and social media applications are most effective as communication and dialogue channels. The basic idea that is fostered by social media applications, and thus also by e.g. the Finnish Wiki Party, can be collated in the idea of open politics, which accentuates the principle that anybody can participate, participants and their statements are considered equal and all arguments are documented in a transparent way. The radical level of the open politics is the idea that users engage in the discussion about rules of societal conduct. According to the dictate of open politics, the laws of society should be derived from the public discussion (Hintikka 2008: 71).

The key word of social media enabled participation is empowerment. This empowerment is reflexive, i.e. it is usually based on some substance or issue and it is based on temporary coalitions that engage in dialogue on the topic. Reflexivity is based on virtual mob effects, on the power of crowds and distributed networks. Thus social media

induces new kinds of political and economic practices that are not based on the traditional sector political map. However, the key idea of the reflexive empowerment is that social media open grass-root channels for the collaboration and co-operation on a global scale. One should also recognise that network effects and crowds are heavily utilised for business purposes and not every mass event bases its roots on the democratic liberation of the citizens.

According to the enthusiasts, virtual worlds like Second Life, can be important laboratories for the monitoring of the changing practices of the nation-states. For example Ondrejka (2007: 46–48) talks about three types of citizenships of the nation-states. First is the geographic citizenship (g-citizenship) that is traditional national citizenship. Second is the honorary citizenship (h-citizenship) might be offered to specifically valued citizens. In the virtual worlds, new kind of virtual citizenship (v-citizenship) is emerging. According to Ondrejka, v-citizens form a potential "pool of entrepreneurs and innovators targeted to specific national goals and needs".

It should be noted that participation through social media accentuates the substance orientation and short temporal span of the coalitions. Networks are in the critical position in the focusing of the popularity. Social media opens interesting possibilities for political participation. For example, there could be several 24/7 polling services gathering quick citizen opinions on different issues. These polling services could be targeted for different geographical scales, e.g. local issues, national issues, European issues and global issues. In addition, there could be several niche communities based on different topics. This development would lead to a new kind of transparency in the political system. Thus, social media could be a catalyst for the societal participation. One way to activate societal participation is to engage in political prediction markets or "idea futures", as they are sometimes called (see Hanson 2007; Abramovicz 2007). In these markets, user's bet for the best opinions or ideas or the best political candidates. Prediction markets could be utilised to complement expert methodologies or statistical surveys. As Abramowicz (2007: 90) argues, the prediction market method is a good way to identify a consensus position of different opinions and ideas.

Societal participation through communities has some ethical points that deserve special attention. The key element of the social networks is the "eternal memory" and its nature as a surveillance mechanism. For example, Albrechtslund (2008) argues that online social networking creates a new kind of space of participatory surveillance that is based on mutual practices, soft power and empowerment and sharing. In the same vein, Zimmer (2008) states that the relative invisibility of protocols and filtering mechanisms in the services forms a disciplinary power based on "panoptic sorting". These treatises point out that the key concepts of social communities, like "transparency" and "empowerment", should be also thought out from other angles.

Participation through social media could also haven even deeper societal effects. Jarrett (2008) argues in an interesting intervention on the role of interactivity in the Web 2.0 that participatory media produces flexible and active users who are "aligned with the needs of the culturally intensive capitalist industries associated with neoliberalism or advanced liberal economies". She states that interactivity is disciplining technology where users internalize the roles of "active, entrepreneurial citizen". User's become actors who are oriented to the needs power, which is based on seduction instead of a punishment. Jarrett's idea of the networked and proactive form of power is crucial, because much of the discussion about the participatory media is also oriented to the needs of neoliberal power, and since seemingly "powerblind", in its underlining of user activity and freedom of individual choices. Even in the distributed and collaborative networks the power is present, even though not always acknowledged.

5.1.2 Roadmap: Societal participation through communities

VISION

Political decisions are made in a transparent way based on extensive information gathered also from social communities. Gathering of extensive information is assured by organizing citizen voting on different issues and by making sure that everybody can participate. Society is governed by continuous and open dialogue between citizens and decision-makers. Social media driven communities of interest are central fora of political discussion in society.

Present

Drivers. As a current important driver is the growing use of new communication channels and technologies. Another driver is the possibility for the construction of what we call "combined identities". The concept of combined identities refers to building up and reconstructing one's social connections and societal linkages in a more "non-local" fashion. One could e.g. choose the community where one wants to have an effect or to co-operate without the friction of jurisdictional boundaries by combining similar county structures. New kind of topical voting issues also be emerging, e.g. environmental questions are these kind of combining themes that could be integrated with social media applications. Key driver already affecting the political landscape, at least in Nordic countries, is the rising imperative of transparency in the all political activities.

Enabling technologies. The key present enabling technologies are blogs, discussion sites and feedback systems built inside websites. Increasingly social media applications are utilising mash-up social service databases and services that are based on the combination of profiles.

User needs. Present user needs emphasise the need to build new impact channels for the citizens. These new channels might supplement the channels and possibilities of the traditional representative democracy.

Role of communities. Currently communities act principally temporarily and they are mostly focused on one issue. Presently it is quite easy to organize political communities around some current agendas, e.g. in Facebook. For example, in one workshop it was suggested that services like Twitter and Facebook might pose some challenges to political organizations, because of the fast and wide mobilization and activation possibilities these open among the users of these services.

Services. Most important services in the societal participation are virtual poll machines and different kinds of prediction markets and betting mechanisms.

Business models. Business models are not clear yet. There are some sporadic activities outside the polling seasons.

Mid-term (1–5 years)

Drivers. In the mid-term the need to utilise the grass-root immediate feedback in development rises in importance. The citizens take more participative roles through social media applications and try to impact before the official decision-making.

Enabling technologies. Intelligent aggregation systems will arise in the mid-term. These systems might have crucial effects on the depth of understanding participation behaviours in the web. These systems analyse and integrate different perspectives and opinions utilising data mining. Based on this information one can make deep queries of the behaviour of the users. Data mining applications could also be used to focus interest groups in societal questions and e.g. in marketing of the companies. Also, new possibilities for database utilisation are on the use.

User needs. New kinds of dialogical and transparent communication channels are emerging. On one perspective, there will be new possibilities to keep "an eye on the decision makers", e.g. to follow the activities of the deciding bodies and evaluate the promises and realized activities. Also, through these channels, decision makers can give additional and more nuanced information of their activities that pass the mass media channels. Emerging user need might also be possibilities for content-driven voting. This means that in the voting one could give first and second options in the voting. This could induce changes in the electoral behaviour and requires social media based analytical tools. This could also lead to a rise of the substance issues in policies, e.g. one could construct a personalised political profile from issues of multiple political parties.

Role of communities. In the mid-term, the role of communities in the societal participation will be enhanced. A lot of communities of citizens and non-governmental organizations will form to drive different political agendas. These communities will mostly be formed in the areas of political vacuum, i.e. where there is no clear political actor or deciding authority. Further, these communities offer possibilities for the combination of different political perspectives.

Services. New kinds of services are emerging rapidly in the mid-term. For example, two-directional communication channels and platforms will be presented that enable the dialogue between political decision-makers and citizens. These services are tools to enable transparency in the political action. Newer services might also include "indicator of poll promises", i.e. a tool for the evaluation of promises and strategies of the decision-makers with the actual activities.

Business models. In the mid-term, business models are emphasising continuous dialogue and feedback, e.g. rating and commenting services. Also, "common good" is on the rise as a general business model. Social responsibility and common utility is important strengthening feature in the new business models.

Long-term (over 5 years)

Drivers. In the long-term the need to utilise the grass-root immediate feedback in development practices will be a necessity. Citizen participation and dialogue will also be enhanced. Transparent dialogue and evaluation will form a standard part of the decision making process.

Enabling technologies. Technologies will become more ad-hoc, heterogeneous and also ubiquitous, e.g. constantly networking with other gadgets and surroundings. Applications can be reached by multiple devices. The handiness and easy-to-use will arise as key principles of the technologies.

User needs. Dialogue between citizens and decision makers will be important user need in the long-term.

Role of communities. In the long-term, there will probably be many communities of citizens, NGOs and companies driving certain political and topical issues. This widens the social responsibility of the companies and other actors.

Services. Same as in mid-term.

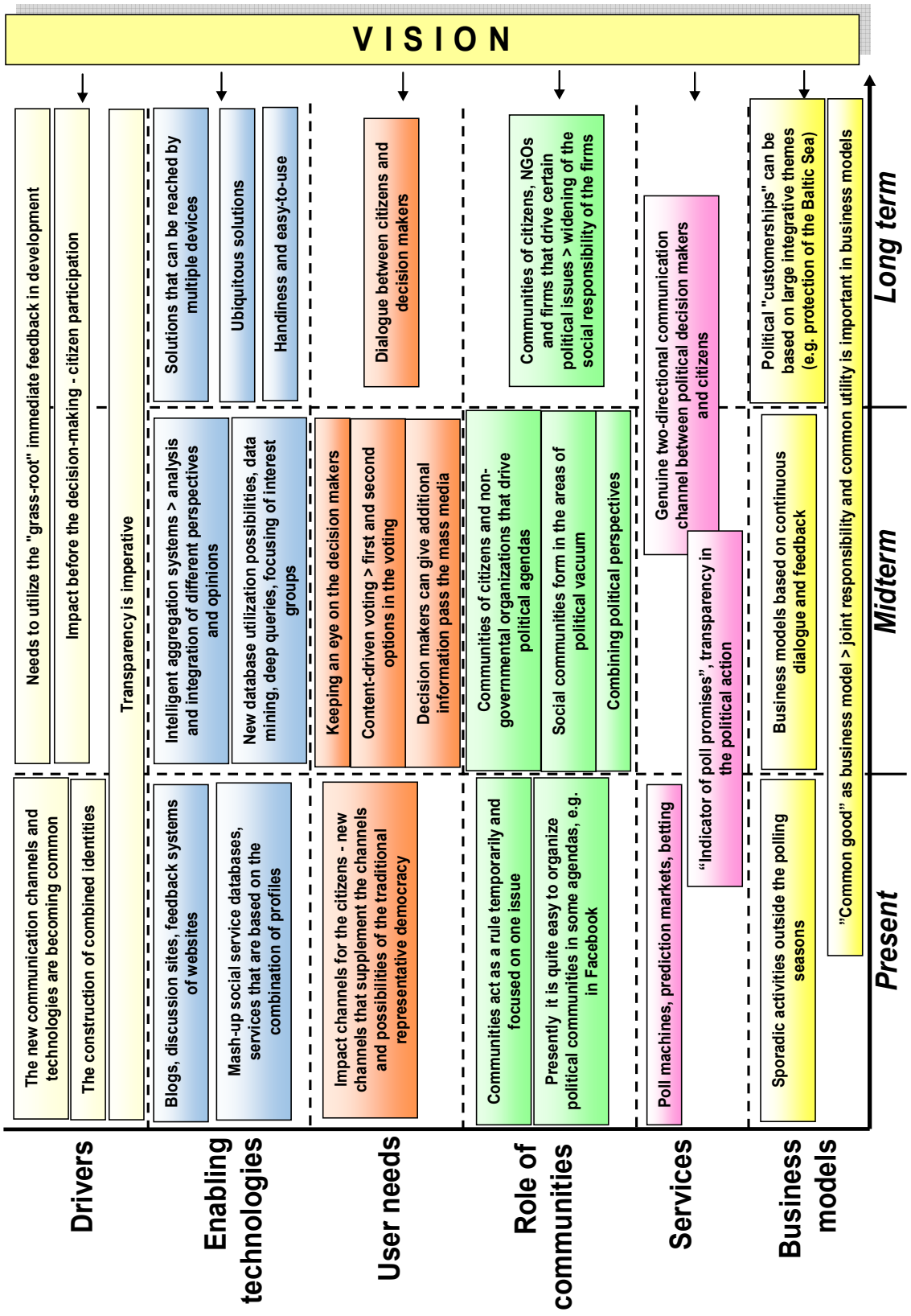

Figure 9. Roadmap: Societal participation through communities.

Business models. In the long-term, political "customerships" can be based on large integrative themes, e.g. protection of the Baltic Sea. "Common good" will be crucial also as business model.

5.1.3 Service examples

Public virtual community

The first application example in the society theme is a web environment that provides citizens with information on things such as public affairs, the constitution (including human and constitutional rights in layman's terms), upcoming elections and political parties. An easy to use search engine will hand out answers to questions on these topics quicker than Wikipedia. The site has links to all parties', government offices' and EU websites. The application offers content in various forms; written, multimedia, or purely audio, for specially abled citizens. There may be free webcam meetings within the community, and user produced video is one of the possible contents. It offers a service to select the party that is most compatible with one's opinions and to create one's own political profile. It has a virtual community where the members from all factions of society, ranging from decision makers who are hoping to connect with their voting pool in between elections, to schoolchildren and blue collar workers, can participate in discussion using their profiles. The community will hold polls on current issues, and the results will be direct feedback for the decision makers on voter satisfaction. Anyone may browse the site or join the community. The application is usable via computer or mobile.

Intelligent voting

The second application example is made to measure online voting service for referenda and national or local elections; it may be in connection with the first application or it may be separate. If one is unsure what to vote, the application will answer any questions and offer suggestions. A biometric recognition system will be necessary to ensure the integrity of the system. The real application will only be available for those who are eligible to vote, but there may be a voting simulator for minors. The technological requirements pose limitations as to where this application may be used; as long as all home PC's don't have biometric sensor technology, designated devices will have to be offered by the government in places such as libraries, government offices and schools. These applications will have strict rules on who can advertise within them and from where to accept financial support in order to protect democracy.

5.2 Companies

5.2.1 Business aspects of social media

In the second theme of social media roadmap we emphasise business aspects of social media. It could be stated that that there has been some radical changes in the business environment due to the emergence of social media applications and culture of open innovation. These changes emphasise at least the emergence of a new kind of amateurism as the basic block of services. Firms are utilising crowd-sourcing as a basic service to get new ideas and also to get hands on experience of potential new market segments. Another set of services are open innovation intermediary activities (Antikainen & Väätäjä 2008). Examples of the providers of these kinds of social media services are Cambrian House, Owela, InnoCentive, Crowd Spirit, Yet2.com, NineSigma, FellowForce, Idea Wicket and Ideacrossing, to mention just a few.

Applications of social media allow distributed working in a grand scale. At the more distributed working culture it is possible to combine local and particular knowledge to a more generic knowledge e.g. by utilising wikies. This enables the creation of new localized services. Also, the systems for distributed working should be flexible in order for them to be adaptable to different local conditions. To enhance the localization, firms could put up a portal, e.g. wikies, for the B2B communication and also for worker to worker communication. Customer based product development will be a growing form of business activity. The aim of the customer based development is to engage the customers by building different kinds of arenas and networks for the continuous feedback and commenting. Thus, in the short term these customer arenas may be channels to form “brand societies”.

There are already quite widely utilised third party services to collect product comments for the corporations. However, it should be noted that participation in open innovation communities is driven by multiple motivations. The basic starting point is the user need (Lakhani & Panetta 2007: 103). Some participants might have needs for some functionalities or features that are not present in the commercial products. Some participants might engage in the collaboration for its creative stimulus. Others participate for fun, leisure and social reasons (Evans 2007: 59–60). Some contribute for the sake of their employer’s initiative, and some because of the recognition and merit from the community. As Lakhani and Panetta (2007: 104) note, a sense of belonging to a community is the key driver for the productive participation.

In the longer term, the discussion and feedback could be more embedded into the product development processes of the firm. These customer arenas could include a show room in order to get designs from customers and also to customise service packages.

The aim is to develop communities of trust that give trusted feedback to be utilised in the research and development. The other option for the communities of trust is to make larger citizen surveys to raise the plausibility of the evaluations. At the more general level the changes in the business environment can be summarized as transparency, participation, customization and on-demand information. As a more radical consequence of distribution of work is the formation of networks that could be called work swarms. In works swarms, myriad amateurs and professionals in firms and organizations coalesce and communicate. These work swarms operate in an outsourced project mode: there is a "grey mass" of potential workers or authors for whom are given objectives, demands and whose interaction is backed up by socio-technical structure of the work swarm. Work swarms should utilise technologies that enable many to many communication and project management with extremely many participants. Technologies to do this exist already, e.g. blog (one to many), wiki (many to many). However, social innovations to enable this kind of working are still emerging.

In the working culture, there are also interesting emerging issues triggered by social media. Amateurs can, at least partly, create a new kind of professional possibilities by blogging, commenting, sharing information and co-operating in networks. These "amateur-pros" can rise to a level of niche leaders by identifying and describing weak signals, emerging issues, in their fields of interest.

Work swarms could, in some cases, replace traditional organisation structures in companies. As was discussed in the workshop, the SaaS (software as a service) principle could be applicable to companies to form an "EaaS" (enterprise as a service). In SaaS, the application is spread across the web so that users do not need to install the programs to their own computers. The using of the software is charged with on-demand pricing system. The operating of the software is thus distributed and modularized. In the case of companies, we could talk about ultra-thin organizations or project companies. Participants of these work swarms can be members in several project companies. When the project companies are inactive the members' social networks keep up the customer relationships.

Work swarm culture is already emerging in the activities of the companies such as e.g. Dell (idea storms) and Procter & Gamble (crowd sourcing and open innovation practices). Also Lego mind storms are interesting examples of the work swarm that is built around "Lego gurus" that have decided their own designs. Also, multiple networked expert communities exist. For example, this kind of idea storming has been used in the ideation of tools for regional planning and for the development of BIM (building information model) software.

This all suggests that innovation activities and innovation management have become key activities of companies and organizations. At the same time, the innovation activity

itself has penetrated the organizational levels and become pluralized. One can talk of distributed innovation activities (see Lakhani & Panetta 2007). Dooley and O'Sullivan (2007: 405–409) distinguish four innovation levels that are important in the management of the distributed innovation networks: individual innovation, project innovation, collaborative innovation and distributed innovation. Dooley's and O'Sullivan's contribution suggests that there is a variety of tools available for the management of innovation at the differing organizational levels. Applying social media in these tools could give them a new boost.

Dodgson et al. (2005) have called technologies and practices that foster open innovation and collaborative interaction over organizational and corporate boundaries "innovation technologies" (IvT's). Principles of social media are widely utilised in IvT's. For examples, Dodgson et al. (2006) have studied how Procter & Gamble (P&G) utilised IvT's in its "Connect & Develop" strategy from 1999 to 2005. The idea was to emphasise connections internally between different P&G's different communities of practice, like R&D units and business units, and also externally through joint technology developments and licensing (Sakkab 2002). Utilization of IvT's demonstrate that innovation creation is as much about new organizational practices – knowledge construction, sharing and using – as it is about technological solutions. In its corporate strategy, P&G utilised IvT's in several fields: data mining, simulation and modelling and in virtual and rapid prototyping (Dodgson et al. 2006: 339–340). There are also other interesting studies that analyse the utilisation of different virtual solutions in business development. For example, Prügl and Schreier (2006) have studied the behaviour of the leading-edge customers in the popular computer game the Sims. Piller and Walcher (2006) have analysed how large companies, like Procter & Gamble, BMW and Adidas, have utilised Internet-based toolkits to stimulate idea competitions and open innovation atmosphere in their organizations.

For example, virtual worlds, like Second Life, can be vital sources of entrepreneurial activities because of their spatial and place-like communication possibilities, low production costs, and pseudonymity (see Ondrejka 2007). One important aspect is that when using pseudonyms or alternate identity, failure, being the most common consequence of the innovative firm behaviour, can be tolerated and even tested quite easily (Ondrejka 2007: 38). In that way the virtual world might provide an experimentation platform to test ideas and make distributed innovations.

According to Evans (2007: 59–60) the spatiality of *Second Life* induces several activities that might spur innovations: fun, experiential learning, simulation, trust building, experimenting with personae, chance interactions, low production costs and experiments in social physics. However, as Evans (2007: 60–61) also notes, innovations made in virtual worlds are not yet fully capable of being transformable to real worlds, but he sees that this kind potential is also existing.

The prerequisites for the corporate social media applications are in the business models they enable. Von Hippel and von Krogh (2006) discuss an interesting model of open innovation that could prove to be quite applicable to future companies engaged in collaborative and distributed activities. They call it a private-collective mode. The basis for this mode is the free revealing of information that allows collaborative innovation process and participatory activities on it. Von Hippel and von Krogh (2006: 298–302) demonstrate cases where opening up the information, e.g. corporate R&D information, is a successful strategy.

Von Hippel and von Krogh suggest that the advantages of collaborative development could be understood as a nexus of private and collective modes of thinking. It is combination of private investment models, where innovators gain benefits from monopoly situation formed by not revealing the core information of the innovations, and collective action model, where free riders and innovators are profiting equally from the public nature of the good (von Hippel & von Krogh 2006: 304). In the private-collective model suggested by the authors, some core ideas of the innovations are kept secret, but otherwise the information is shared as public good. According to the authors, this model would enable the utilisation of private investments as the basis for development but also allow the benefits of scale and network effects caused by the free revealing. The private-collective model is an interesting possibility for social media communities, since "private-collectives" could utilise revenue sharing as a business model.

All in all, the key to applying social media in companies is to be found in the corporate culture. Dodgson et al. (2006: 343) state that adoption of the practices of open innovation requires vast cultural adaptations. Innovation technologies are thus not just technologies, but socio-technical coalitions. These new applications foster networked innovation that utilises scale in ways that were not possible before (Rodriguez & Solomon 2007: 5). Rodriguez and Solomon (2007: 6–7) list several enabling tools for collaborative activities: instant messaging, conference calling, video conferencing, shared whiteboards and documents, virtual spaces, wikies, blogs and question/answer sites. In addition, the effects of networked innovation are also dependent on community architecture and dynamics. The successful utilisation of innovation technologies requires also taking advantage of repeatable processes. As Rodriguez and Solomon (2007: 12) point out: "established organizations often have antibodies that emerge to crush new processes that don't easily fit". Open innovation practices also pose some adoption problems for a strictly planned corporate culture. Lakhani and Panetta (2007: 109–110) have identified three reasons for this. In the open innovation communities, the level of failures is quite high. Secondly, the innovation activity is emergent in a sense that it does not fit easily with annual corporate plans. Thirdly, there might be high resistance towards open innovation and it is approached as a threat to internal experts.

The utilisation of the social media applications is therefore not a straight-forward and easy task for companies. On the basis of the workshop discussions, the most important obstacle for the adoption of social media applications is the corporate culture. For example, companies might not tolerate the direct and open communication between the workers at the different levels of the organisation. Corporate culture might also, despite the official statements, incorporate an implicit intolerant element: only positive comments are accepted and tolerated, and negative ones are ignored, silenced or deleted. In the workshop dialogue, there was some discussion, although a little bit tongue-in-cheek, about the need for "asocial media", i.e. the need for the corporate culture to tolerate and embrace the learning value of negative criticism and feedback.

The "transparency tolerance" of the corporate culture is tested especially in the utilisation of corporate blogs and wikies. Wikies can be important channels for the mobilization and sharing of tacit knowledge in firms. The transparency of the wiki might be an obstacle for the corporation, but mostly the problems are not technological, but cultural. They are about processes and ways of functioning in the firms. Considerable resistance to change might emerge for example due to the age structure of the company. One might say that generation chasm is vividly expressed in the social media applications. It could be visible e.g. in the attempts to bring the old corporate database format to wiki or in the utilisation of e-mails in the tasks that could be done efficiently with wiki-type platforms. Sometimes also the embedded and deeply sedimented practices of the firm disable the utilisation of social media tools. The ideas or the initiatives are not shared, because there is no guarantee that the credit of the idea goes into the right person. The key issue is to reward the inventor of utilizable idea. Furthermore, even the presenting of the new ideas might be problematic in some corporations. This could be solved e.g. by presenting ideas via pseudonym or via "fake personality" in social media application.

5.2.2 Roadmap: Interacting with companies through communities

VISION

Companies utilise the principles of open innovation as the key R&D strategy. It includes co-operation with other organizations in fluid networks and extensive utilisation of crowd sourcing. The tools of social media are utilised widely in companies, especially in innovation activities, R&D, marketing, sales and maintenance. At consumer level, social media enabled communities are engaged in continuous proactive dialogue. Communities include citizens, companies, agencies and government actors. These user-oriented communities have become crucial elements in guaranteeing the social responsibility and transparency of business activities of companies.

Present

Drivers. The specific present driver pushing the interaction between user communities and companies is the growing acknowledgement of the role of the users in the development of services. Also the rising wave of open innovation emphasises the role of users and peers as critical resource in the product development. Therefore, the need to start the dialogue with users emerges. There is also a technical and brand driver in this issue: the companies have a need to utilise state-of-the-art community platforms to engage in the open innovation paradigm.

Enabling technologies. Enabling technologies utilise data mining, e.g. behavioural targeting and opinion filtering. Tapping the customer information and applying of marketing data are important data mining applications. Further enabling technologies are blogs, feedback systems and discussion platforms.

User needs. Present user needs concentrate on giving feedback on the products and services. Usually this simply means recommending or dumping products. This is often done by giving examples of personal user experiences – good or bad.

Role of communities. Communities form a discussion and feedback channel. Communities are also important fora for rating and evaluating the products. Further role for communities are on the research and development functions and novel innovation processes of the companies, especially in the form of innovation jams and innovation raids. In addition communities can also help companies to create a dialogue with their customers and enhance customers' relationships.

Services. Services include community platform for the giving of feedback on the products and services.

Business models. Present business models emphasise viral marketing. Grass-root transactions, like word of mouth or product evaluation and recommendation blogs, are accentuated. Social media applications are utilised in new kinds of marketing as personalizes marketing and sales as easy feedback and commenting systems.

Mid-term (1–5 years)

Drivers. In the mid-term, communities form a crucial platform for marketing, development and discussions among customers and between companies. Community technologies are thus important market drivers in the mid-term. Engaging in communities is also important for weak signal identification and utilisation. The amount of innovation intermediaries working between companies and users increases rapidly in the Internet.

The role of traditional advertising diminishes and marketing turns more into a permission marketing (Godin 1999), where the main idea is value creation for both, customer and companies.

Enabling technologies. In mid-term, data mining applications will rise in importance and they are used widely. Mobile technologies are applied in many ways. Commenting and discussion fora can be accessed via multiple technologies and devices thus forming kind of multi-technology communities.

User needs. In the mid-term, tailoring of the products will emerge as an important user need in the interaction with users and companies.

Role of communities. Role of communities is underlined as discussion fora. Communities will be a sort of continuous evaluation tool for the corporate brand and dialogue channel with other customers and companies. Transparency and socially responsible business models will pay off in the longer run as communities build and form a pool of "virtual transparency stocks" – trustworthiness and transparency of the corporations is continuously evaluated in multiple communities. Communities will also form reward mechanisms that build up reputation of the companies acting in transparent and user-friendly fashion.

Services. Services in the mid-term will highlight service crafting and directing discussion platforms and applications for planning personalized products.

Business models. Tailored mobile marketing is growing its importance. Mobile purchasing of the products will become increasingly available. Social media services are widely utilised in user-driven innovation and open innovation activities. Innovation processes of companies will consist of open ideation modules and more closed strategic planning modules. Social media applications are also utilised in maintenance of the machinery and infrastructure.

Long-term (over 5 years)

Drivers. Key long-term driver of the companies will be their "transparency value" and credibility that is constantly evaluated in the discussion communities and through their community actions. Therefore, community technologies are also market drivers. Emerging drivers are the new corporate tools that utilise principles of social media as the communication channels and ERP's of the companies. Customers are more and more expecting that companies offer them communities offering them added value.

Enabling technologies. Utilisation of data mining and semantic web will be crucial enabling technologies. Virtual or enhanced spaces are increasingly combined with physical spaces. New kind of modelling and design interfaces will emerge.

User needs. User needs highlight the possibilities of tailoring the products in minute detail. This also enables planning of one's own personalized niche products.

Role of communities. Companies are working through three operation modes. First one is the open sourcing mode emphasising idea and innovation collecting with principles open innovation. The second is the semi-closed ideation mode, which is utilised in R&D functions. Semi-closed ideation utilises trusted communities composed of customers, partners and internal experts as the company R&D community. The third mode is the closed strategy mode in which the company's strategy is formed in the internal planning process. Communities and transparency are important factors for the brand formation of the companies. Interacting through communities and making business through them will form a key business model.

Services. One can plan specialized and private product categories. Through the new dialogue platforms, one could also affect the strategy processes of the companies.

Business models. Tailored design services will be a new business model that is enabled by community technologies. These design services and information models will be utilised in small niche production as well as larger mass-customized products. Transparency will be widely understood to be a competitive edge for the new kind of modular and network companies. Traditional companies add social media services as a part of their services.

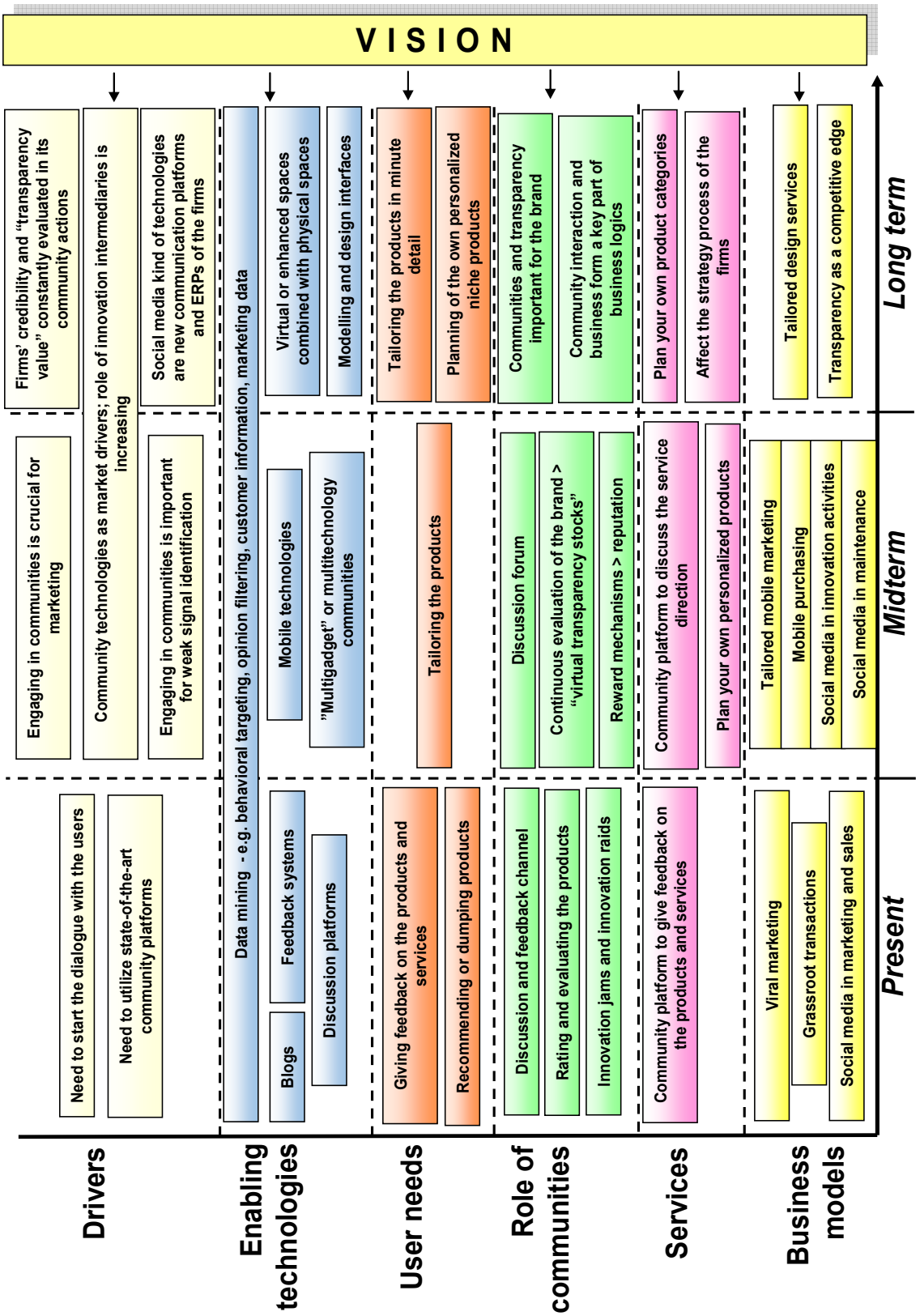

Figure 10. Roadmap: Interacting with companies through communities.

5.2.3 Roadmap: Social media in work environment

VISION

Social media applications are widely used in work environments. The resulting overall work milieu enhances work motivation and supports the well-being of the employees. Social media applications are also seen as tools for learning and creating competence. The culture of leadership allows space for developing collective creativity through social media.

Present

Drivers. The key driver is the continuously tightening efficiency requirements. Another significant driver is the hectic working culture. As a combination, these drivers characterize the present working culture of distributed organization with multiple parallel meetings and communication channels. Further driver is the rising demands for possibilities to combine work and leisure. In global and multinational companies and organizations, because of multiple activities in multiple time-zones, working hours tend to spread beyond regular working hours. Information workers also seek to diversify their work by doing some of it in the first home or second home surroundings by combining more free-time activities with working.

Bottlenecks. The most central current bottleneck for the adoption of social media applications in work environment is company culture. Technologies and advanced applications exist already, but the company tolerance is the critical issue. Reflecting on the workshop discussions of this project, the underlying reason for this stems from three directions: 1) companies have doubts about the information security in open innovation and dialogue platforms, 2) companies fear the possibilities of headhunting through these open networks, and 3) some companies see the utilisation of social media applications as simple waste of working time.

Enabling technologies. The present enabling technologies as in Figure 7.

User needs. The present user needs accentuate easy-to-use tools for the company environments. Also, the usability of these company tools should be clearly indicated for them to pass application level. In addition, tools should endorse networked co-operation. The emerging user need is also to separate physical and virtual actors in the networks. Also, information fitting and contextualization is current and strongly emerging need – there is a clear need to separate totally unfitting information from the potentially fitting information. There is a movement from the just-in-case -information to contextualized and localized just-in-time information.

Role of communities. The role of communities in working life is rising fast. Virtual working environments are already important platforms for open networked innovation, ideation, R&D, communication and project planning in leading companies. These open innovation networks combined with the personal networks of individual employees form new mega-communities that could further be a source new activities and innovations. Increasingly, communities will be important information and competence fountain for the companies.

Services. The current service requirements focus on the certifying of the authenticity of the information contents gathered from the networks or the blogosphere.

Business models. The current business model could be described with term lean organization – new network structures bring more flexibility and enable massive distribution of tasks.

Mid-term (1–5 years)

Drivers. In the mid-term, the efficiency requirements are still an important driver for the adoption of social media applications. Different aspects of the meaning of work are emphasised. Workers value jobs that combine ethical issues with flexibility, dynamics and job security.

Bottlenecks. The company culture is a sticky thing to change. At present, the social media applications are considered as risks for the information security. Possibilities to utilise these application for headhunting is another source of risk for the companies.

Enabling technologies. In the mid-term, tools of the project management in the companies are more and more based on wikies, blogs and RSS Feeds.

User needs. The user needs highlight the transformation from the device-oriented networked co-operation towards heterogeneous network co-operation in which the network can be reached with multiple devices and through many software platforms. There is also a new working culture in the mid-term horizon that can be called modular professions. This means that one could be working in several project modules in several companies. The key issue in the idea of modular professions is that one does not need to utilise the same competencies in every module, but some of the modules might utilise different competencies than others.

Role of communities. Communities form new recruiting markets for the search for competencies. Communities act as a knowledge pool from which modular companies can seek the competencies for their projects. Running a modular company requires

proactive talent management: flexible outsourcing from the knowledge pool of different competencies and expertises.

Services. Services include offices for time management and networking of the corporate intros to create opportunities also for smaller enterprises.

Business models. Marketing material and marketing activities utilise blogs. Companies transfer their activities also to the virtual worlds, e.g. headhunting is increasingly done in SecondLife and via social networking services.

Long-term (over 5 years)

Drivers. A crucial long-term driver is the need to craft working environment and contents of the profession according to one's personal interests.

Enabling technologies. Emerging enabling technologies in the long-term consist of mobile communication platform that is integrated in clothes and/or in body. Also, device independent and integrated file and communication management system will be important resource for the mobile social media applications.

User needs. User needs highlight the transformation from the device-oriented networked co-operation towards heterogeneous network co-operation in which the network can be reached with multiple devices and through many software platforms. Modular companies and people with modular professions are more and more common.

Role of communities. Inside these larger structures, i.e. mega-communities, there are sub-communities. These sub-communities are diverging on the basis of the interests and on the combination of needs. Communities act as work swarms or talent pools, where people have the opportunity to work in several "project companies" simultaneously with light and flexible contracts. The rise of the ultra-thin organizations creates possibilities to work e.g. in different nations.

Services. New services based on semantic web and advanced data mining techniques are on the rise. Information mining and gathering function can be performed by interpretation and filtering agents (abots). Furthermore, ultra-thin organization is a service that solves the needs of their clients through communities.

Business models. Innovation democracy practices in the working environments. Innovation, ideation and development are seen as a fruitful basis of the work environment instead of a duty.

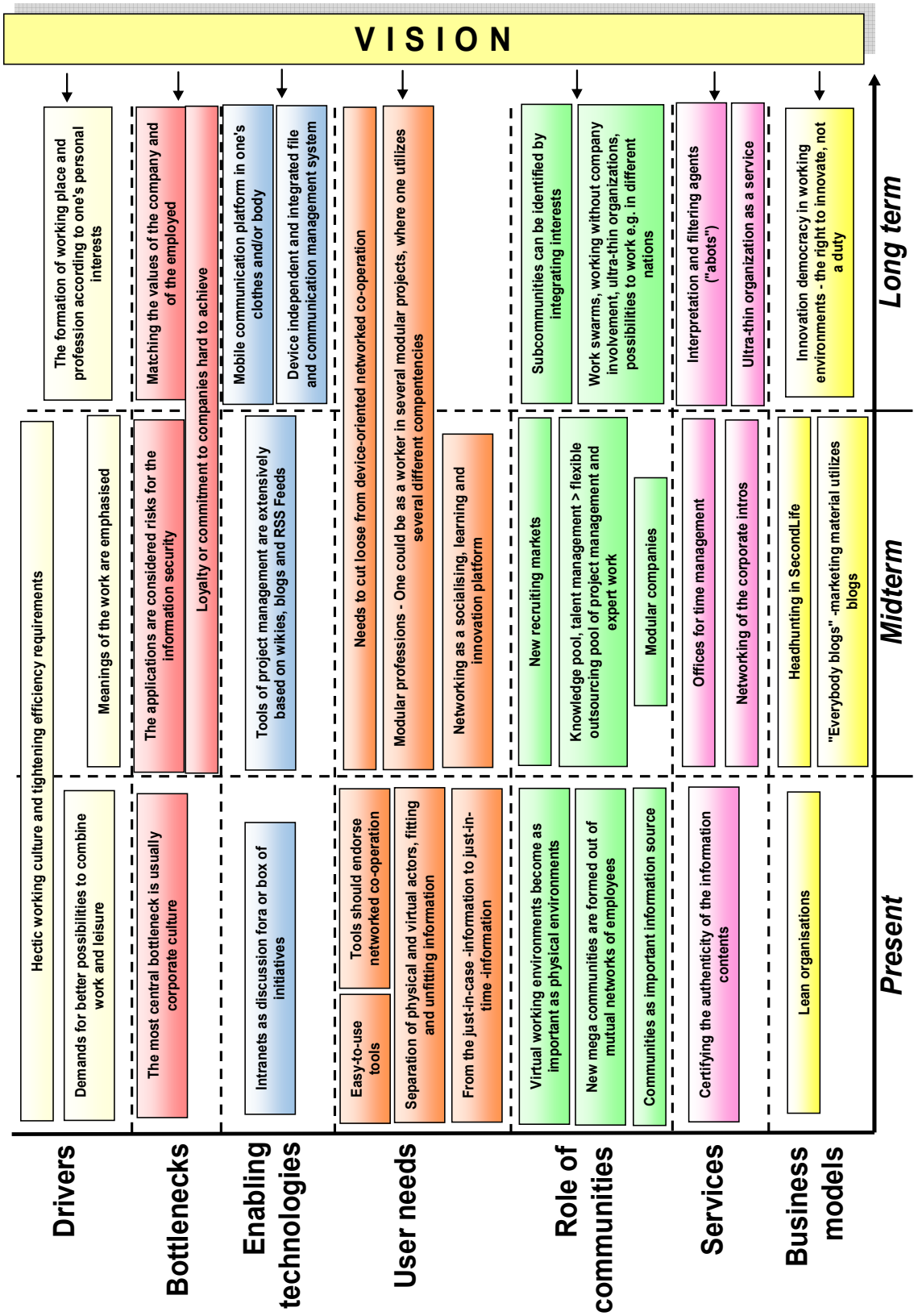

Figure 11. Roadmap: Social media in work environment.

5.2.4 Roadmap: Social media enhanced shopping

VISION

Shopping and consuming are important activities mixing and matching virtual and real-life spaces and experiences. Shopping offers a co-experience of interacting with things, friends and milieus. Shopping will be as much about interacting than it is about purchasing something.

Present

Drivers. The important present driver is that shopping on web is increasingly approached like just another way of shopping. Net-shopping is already a common practice for the so-called net generation (people born in the 90's and later). Also, more people of the "non-net generations" find net shopping to be a satisfactory way of consuming.

Bottlenecks. Key bottleneck is the threshold to use web applications, and bad experiences from previous uses. Some people are hesitant about making transactions on the net. The social aspects of shopping are weak compared to shopping with fiends in a mall. Often, information on the web is used to back purchases made in real-world shops and vice verse.

Enabling technologies. The most important current enabling technologies of social media are blogs, wikies and different discussion platforms, where information can be shared among peers. Also web technologies supporting the ease of giving feedback e.g. rating and commenting are already utilised widely. Applications utilise rich user interfaces (AJAX), and product information and visualisations are available.

User needs. Present user needs emphasise flexibility of shopping, web shops are open 24/7. The available selection is wide on the web. Shopping experience should be fluid and the price level should not exceed that of real-world shops.

Role of communities. Communities provide all kinds of information about the products, particularly such information that is missing from the company sites. This may be information about the ethics of production or sources of raw materials. Communities provide user reviews and commentaries about the quality of the products.

Services. Current services are mostly reviews and recommendations within predefined product categories, or giving ideas for presents. There are services for companies that want to set up a virtual store, including computer applications, consulting services, and various kinds of analytic services.

Business models. Crucial business model is personal sale services in the net. Consumers can easily put up their own web shops. Second life is a good example of new kind of web shop experience.

Mid-term (1–5 years)

Drivers. In the mid-term an important driver is the development of virtual worlds. These worlds enable new kinds of services, like virtual mega-stores which can be entered by avatars. People want to have unique and personalised products, and this drives shopping to the web. Shopping may be preceded by design or planning phase, where the final features are defined.

Bottlenecks. For products needing personal evaluation of the real product before selecting the transition to web shopping is slow. Also, logistics may still be a problem for some items like food.

Enabling technologies. Enabling technologies in the mid-term are new platforms for shopping sites, like in virtual worlds, and systems that let people customise products easily.

User needs. Easiness of shopping gains importance as a user need. In the age of high energy costs, users want to avoid unnecessary travelling paving way for virtual malls. Shopping is often a social experience and virtual worlds give some room and shape a setting to it.

Role of communities. Communities act as marketing, recommendation and sales channels for the products. Communities can also offer peer-to-peer consulting services in areas where some support or outside opinions are needed.

Services. New services in the mid-term are recommendations across product categories. They may be generated either by machine or man. Also, recommendation services can be personalized and tailored according to user preferences. Alerting services are offered to give quickly information of new products and services.

Business models. Presently the practices of the physical world shopping are being applied to or imitated in the virtual worlds. In the mid-term we see examples of "reversed" relationship between physical and virtual worlds – the practices of the virtual world are taken into use in the physical world. One example is logging into a shop, i.e. in the grocery shop the user has a personalized profile that can be utilised to make special adverts and recommendations, and guide the person when she is walking through the shop.

Long-term (over 5 years)

Drivers. A key driver in the long-term is the portable personality for presenting information about oneself, and sharing information gathered in multiple services. The advantage is that the user does not have to make the personalization over and over again in different services, and can quickly get personalised recommendations.

Bottlenecks. Supply chains may become even more complex, which may lead to situations, where the information of the origin of the product disappears. Also the trustworthiness of the shops may be difficult to assess, when smaller and smaller operators come to the scene.

Enabling technologies. Semantic web technologies are increasingly utilised in the long-term, which helps in finding items and making recommendations. Different kinds of displays are applied in homes and public spaces bringing physical and virtual shops closer to each others. Mobile devices will have improved usability, screens and longer battery life, making mobile shopping also a viable alternative. The gadgetry will utilise multi-sensory interfaces and sensor data. The integration of TV, virtual worlds, games and social media channels will embody shopping as part of user experience in many areas. Data mining is very important for the service providers.

User needs. Ease of shopping will remain an important user need also in the long term. The totality of the shopping experience is immensely important. New kind of user needs might also be springing from the likely development that a considerable portion of shopping is done in virtual shops and worlds.

Role of communities. New kinds of trusted customer communities and lead-user communities add up to the social media enhanced shopping experiences. Customers expect that web shops are integrated to customer communities.

Services. Support for managing and storing an extensive portable profile, as well as 3D models of one's home as well as of oneself and family members. These are applicable in several services and virtual shops

Business models. In the long-term, virtuality as such will be a regular part of business. There will emerge new virtual business models, e.g. thin and dynamic networks, and new kinds of virtual shops. Various services are connected to shopping, and the life cycle is longer: support is offered from planning to using and recycling the products.

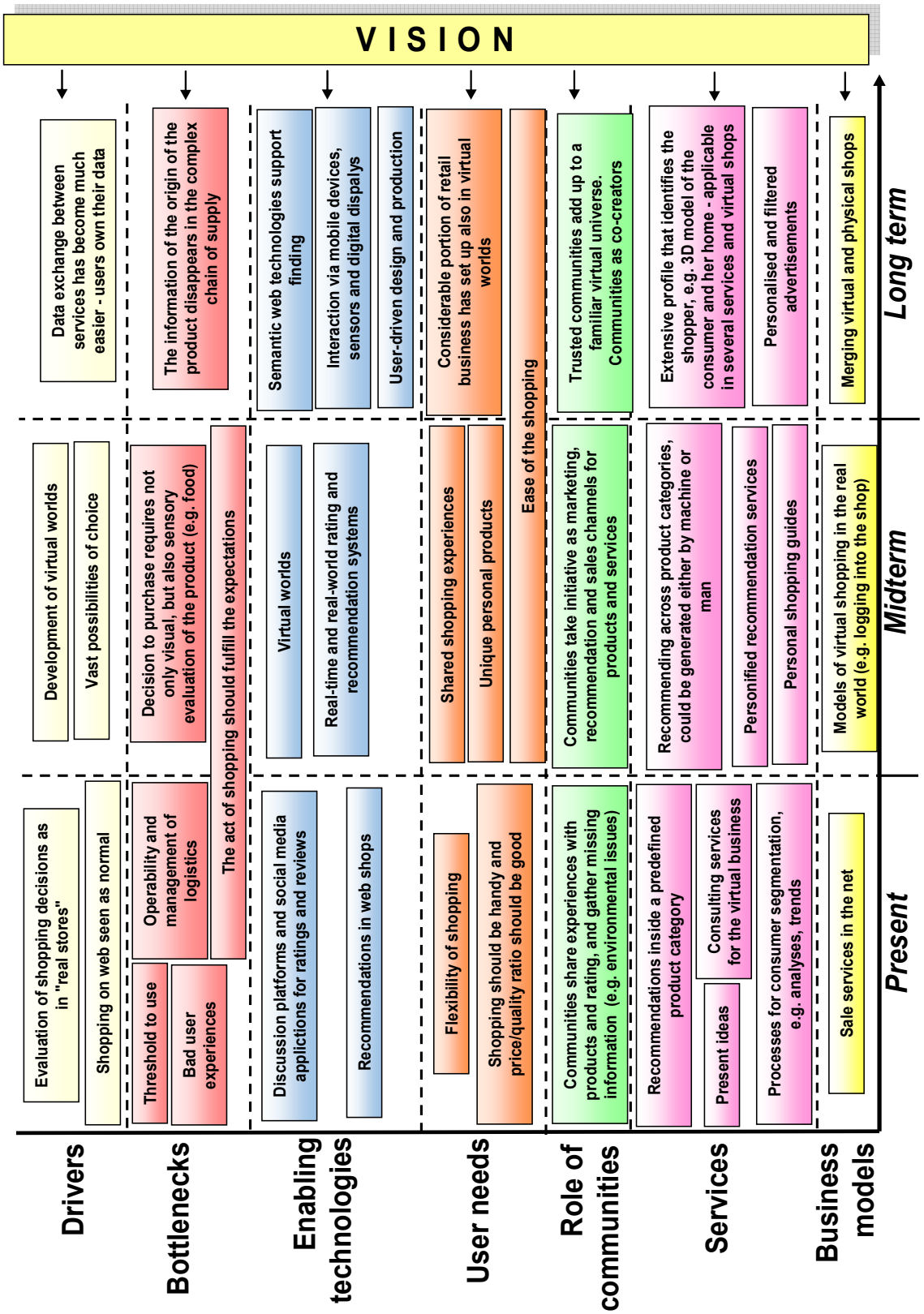

Figure 12. Roadmap: Social media enhanced shopping.

5.2.5 Service examples

Customer feedback forum

The first company level application example describes means by which services may improve their customer satisfaction. We are all used to the feedback mailbox in the corner, with slips of paper to write one's feedback on. It creates no certainty that anyone will ever read the slips, not to mention do anything about them. Therefore, the key word is reciprocity; the customers are ensured that their opinions and requests are received in real time via the customer service virtual community, which is accessible on spot, say at a public health care facility, at the designated customer service computer.

This could lead to empowerment of consumers and to the rise of the individual solutions (e.g. food industry vs. local producers). Customer feedback forums could be expanded also to the Internet of things by integrating a commenting and discussion tags to the physical products. Discussion tags could utilise geo-coded information and combine localized elements to the discussion. Discussion in the forum could handle several topics, such as discussion about the technical issues connected to the products and environmental and ethical questions. The forum could also offer customers some personalized and relevant advertisements that add value. The forum is also accessible by mobile phone. Rewarding members is also an important aspect.

Development communities

Second application example is development communities composed of companies, users and customers. These communities will be an important part of the development functions of the firms in the future. Leading companies endorsing open innovation, such as Procter & Gamble, Dell and Nokia, have already pools that could be called development communities. These communities will be important part of the research and development functions of tomorrow's firms.

Companies are working with development communities through three operation modes. The first one is the open sourcing mode emphasising idea and innovation collecting with principles open innovation. The second is the semi-closed ideation mode, which is utilised in R&D functions. Semi-closed ideation utilises trusted communities of lead-users and customers, partners and internal experts as the development community. The third mode is the closed strategy mode in which the company's strategy is formed in the internal planning process. Communities and transparency are important factors for the brand formation of the companies. Interacting through communities and making business through them will form a key business element for the companies.

Development communities can be based on multi-channelled system for the management of work, communication and project management. This system enables project management and out-sourcing that is independent of place. It is a kind of talent pool for outsourcing where potential outsourcers are continuously linked to the communication channel. Basically this system could be run via wikies, blogs and RSS feeds. This system would include competence profile that tells the most important information about the potential workers for different projects.

Development communities could also be built as product discussion arenas. These could be realised in companies', organizations' or networks' web page and as a wikipedia-kind product services. These product discussion arenas should endorse information in real time and these could be important first steps to create an internet of things. At the level of internet of things the discussion arenas could be integrated to products. As this arena is developed, it could also include application for the customised filtering of the product information. In the discussion arena there would a showroom where consumers could plan their own products. Also feedback and comments will have an effect on the tailoring of the products and on the product variation. Arena would also include a consuming calendar that contains a history about old purchases and profile about purchased items. When this kind material is converged it is crucial information about the differing habits of the consumers. To a company, this kind of service would bring information about standard customers and also about niche potentials.

Benefiting from lead user and small professional expertise

The third application example is a new income model for small entrepreneurships and consumers. It is a forum that is funded by advertisers, and accessed by consumers and businesses alike. The content is entirely produced by the members, who have either professional or lead user expertise on a common subject, for example natural agriculture. Once again, this application is accessible virtually anywhere. It will be lucrative for practitioners of the same trade to meet in a virtual environment, while they may be physically located on opposite ends of the world. The members may also offer services for virtual tourists, who are interested in seeing, for example how a sheep is sheared. This may be accompanied by other stimuli than visual, in order to create an authentic atmosphere for those who are unable to be on the spot physically; such as the smell of a sheep's wool. This will obviously require some hardware development.

Pimp my groceries

The fourth application example answers to the demand for consumer customized solutions, for example in the field of groceries; some prefer the quaint local producers while others want standardized products from large conglomerates. To further target

individuals' unique desires, these products may be customized by intelligent packaging materials that have media content, individually selected package sizes and personalized home delivery agreements.

This application is available to all shoppers, preferably locally as not to burden the environment with unnecessary logistics. The orders may be placed via internet, and the grocer may have an own MSN-like messenger service. It is also possible to include a service where the customer can ask questions about the products he or she considers purchasing, or follow the route of the product. For example, you can watch, as the freshly picked coffee beans you ordered make their way from Brazil to Europe, on a satellite map.

Microscale network enterprises / modular companies

The fifth application example considers modular companies. New companies are formed of communities based on the idea of revenue sharing. These thin organisations can be loosely formed networks of professionals. The network is managed by dynamic resource management systems that track the available experts and allocate tasks accordingly. Business advances through network entrepreneurship which could be a source for the extra income for the workers in other companies. In the future, the basic form of the corporations is modular. In addition, working in these companies becomes modular. One can work in several companies by utilising different competencies in different tasks.

5.3 Local environment

5.3.1 Local aspects in utilising social media

The third theme of social media roadmap emphasises social media applications in local environments. There are two important development trajectories in social media that highlight the role of locality. Firstly, virtual communities are an easy way to reach busy people with busy schedules, and also to organize dialogues on issues affecting the local environment. One of the most important bottlenecks identified in this report is trust, but not so much in the local environment. There, the issues of the trust are quite transparent, because of the potentially small amount of the active and already known participants. Therefore, the users know the local decision makers and they also potentially know the other participants of the communities. Therefore, the feedback is reliable. Secondly, locality is emphasised in the integration of physical and virtual spaces in the form of the growing amount of displays in the urban and consumer environments. Social media technologies are efficient in spreading information quickly, for example warnings, in the local environment.

In the future, the access to the web is no longer dependent on computers and mobile phones, but physical space will include different kinds of screens as well as other access points and interfaces to virtual communities. Mobile technologies support commonly presence and location information. New kind of participatory response services could be applicable to different purposes in the local space. Presence information could be used in the urban space to leave tags and traces of the visits. Lifeblogs save the combination of presence location and user's comments. They can be understood in two ways. On one hand, a lifeblog can be utilised as a regular blog to collect and comment the whereabouts of one's daily life and, of course, also of trips and holidays. On the other hand, content of a lifeblog may also be stored embedded into the urban space. For example, one's friends and acquaintances could track comments and information of one's routines in the cityscape or "copy" the route travelled and places visited by friends.

Another way to apply social media in local environment is by tailoring and filtering information based on collaborative user input, and delivering it as feeds. In this way citizens would have access to relevant information. With direct opportunities for commenting the information can be further enhanced. An important aspect of the information is that the user could get it in different ways. The information could be customised according to the different roles of the user. The same user could need different kind of information when on duty, when travelling and when off-duty. Also, the form, the channel, the elaborateness and the language format of information should be defined to match user preferences. Also, visualisations inspired by virtual worlds could be created. One way of activating local environment could be to form "communities of change", as proposed by Brown (2007). Brown describes a methodology for activating local inventions through open competitions on the net. The community provides the ideas and also rates the winner idea. The approach is used for especially for social entrepreneurs e.g. that have ideas for the improvement of the local community or to drive the development.

Social media application could also trigger changes in the practices of the local governance. For example, the information about the local initiatives could be presented in a local portal. In this portal one could also present informative videos about various issues and visitors could vote for or against them. In our workshop discussion even the idea of the "YouTube governance" was put forward. The term captures the possibilities of social media in the local governance issues. In the workshop we also brainstormed on issues that should be considered when putting up a local community portal. At least the following issues need careful consideration: *transparency* (whose voice is heard and in which ways), *participation* (how the wide participation is achieved and how its effects are made visible), *customisation* (how the tailoring of the information should be made), *reactivity/proactivity* (how the portal informs about issues and how it could foster a culture of proactivity in the local environment), *authenticity* (how to ensure the

trustworthiness of the information) and *public authority* (how the information shared and commented in the local portal affects decision-making and how these affects are made visible).

5.3.2 Roadmap: Social media in local environment

VISION

People interact and co-act supported by easy-to-use technologies. This lets them buy and sell, know and comment, as well as review and support things that relate to their daily lives and surroundings. People create much content easily, and these inputs can be utilised both to filter content and tell the user about items that probably are of interest to him/her. This content is also used to link people to each others and these networks are used as one important source of metadata that helps in filtering the relevant information.

Present

User needs. People want to know about the things that affect their daily life in their local environment. Both local inhabitants and tourists need information about various services and their prices, often when they are on the move. Another user need is to connect with other people in the neighbourhood. There is also the need to influence local matters, e.g. keep up dialogue with local decision makers. There exists also a need to find people with similar values and goals to promote the local matters.

Role of communities. In some places communities act as information producers and sometimes when there is an urgent and important issue, local activities are launched. Often the role of the communities is limited to free time activities, not so much to carrying out daily activities, and digital tools are utilised relatively little. There are many interest-based associations that provide information on their special interest matters, some with local focus and some with wider audiences.

Services. Present services in the local environment are newspapers with local content and ads. Also, unaddressed advertisements are delivered to selected areas, even by private persons. Shop notice boards are important present channels for attaining information about local environment. There are also web platforms for local services, like Finnish "Omakaupunki" (Own town), and several international services that also offer tools for local communities, but they have not yet become mainstream. Furthermore, local issues can be raised in the sites like the Finnish Adressit.com, which is a site for presenting petitions on different causes. Some of the causes are very local in emphasis. Also discussion forums are important services for the exchange of ideas on the local level. In these services, status statements are already widely used.

Business models. Most important current business models are based on either subscriptions or on advertisements. There are also combinations of the subscription and advertisements. Voluntary work and associations are channels for organising activities. Business models in local environment might also include delivery services for local unaddressed advertisement leaflets.

Mid-term (1–5 years)

User needs. Getting kudos and reputation for local efforts and activities is important. Some people want to be recognized as "local experts" in some profession or hobby related issues. User needs that are growing in importance include getting and staying connected to varying types of contacts in an easy to manage ways. These contacts vary from family to work and online contacts. Important rising need is to control one's visibility and protect privacy according to the set user preferences.[5] Rising energy costs add interest to anything locally available.

Role of communities. There are some interesting emerging roles for the communities in the local environment in the mid-term. One of them is collaborative news production and problem solving. Locally based virtual communities can be participatory and multi-actor "idea laboratories" for local issues. Also, communities could be platforms for collaborative expressions for getting attention to unmet service needs or other local matters. They are platforms of local foresight that could steer the course of the local communities towards more proactive course. Communities are also places for ad-hoc collaboration when some issues combining many local actors rise. Communities and networks also play an important role in helping local people to pay attention to important news emphasising local environment. There will be overlapping digital and real-world communities.

Services. Most important services in mid-term are applications with micro-participation opportunities for expressing opinions and contributing with content. Another service area is locality of information. These services are based on selectively connecting people and tagging physical environment. In location bookmarking and browsing one can trace and leave tags on physical objects. Micro labour exchange services can also be part of the local information services. The role of the service providing platform is to ensure trust for committing to real-world activities. Also, there will also be services and infrastructure for creating and accessing "memory of places".

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[5] Realignment of the public and the private challenges the question of privacy, which may be increasingly linked with security issues. Preserving private details of one's life is essential to one's reputation. The loss of privacy might also inhibit freedom. Elevated visibility due to living in a transparent online world means one may never overcome past mistakes as Solove (2008) points out.

Business models. Probably the most important business model in mid-term is still advertising. Sponsored services are also emerging as an important business model. In this model, a company sponsors a service that is potentially popular among its customers. Providing trust and revenue sharing are other important business models.

Long-term (over 5 years)

User needs. In the long-term, the earlier mentioned user needs will remain the same. Many of the tools have become integral part of everyday life and the fascination of new has subsided. People want to stay up to date with multiple things but expect this to be possible with minimal effort. The following technologies contribute to this: displays are applied in homes and public spaces; mobile devices will have improved usability, screens and longer battery life; gadgets utilise multi-sensory interfaces and sensor data.

Role of communities. Collective intelligence is utilised in many areas of the local environments. Virtual communities help to identify and to locate the right people when certain specific information is needed.

Services. There are services generating recommendations and alerts of the different aspects of the local environment. Many services harness collaborative intelligence. These services are coordinated and analysed by virtual personal assistants. A virtual personal assistant analyses and aggregates streams filtered according to person's own interests and preferences, and connects local with global. E-mail is replaced by other services. Semantically supported tools are offered for creating high-quality content with little effort for various purposes.

Business models. New business models are based on trust guaranteeing and privacy support. Revenue sharing will be an important business model for the emerging networks. New business model is also to provide ad-free services for paying customers. Advertising will also be more intelligent, i.e. it utilises analysis of user behaviour and is not obtrusive, rather it acts as a match-maker between parties for mutual benefit.

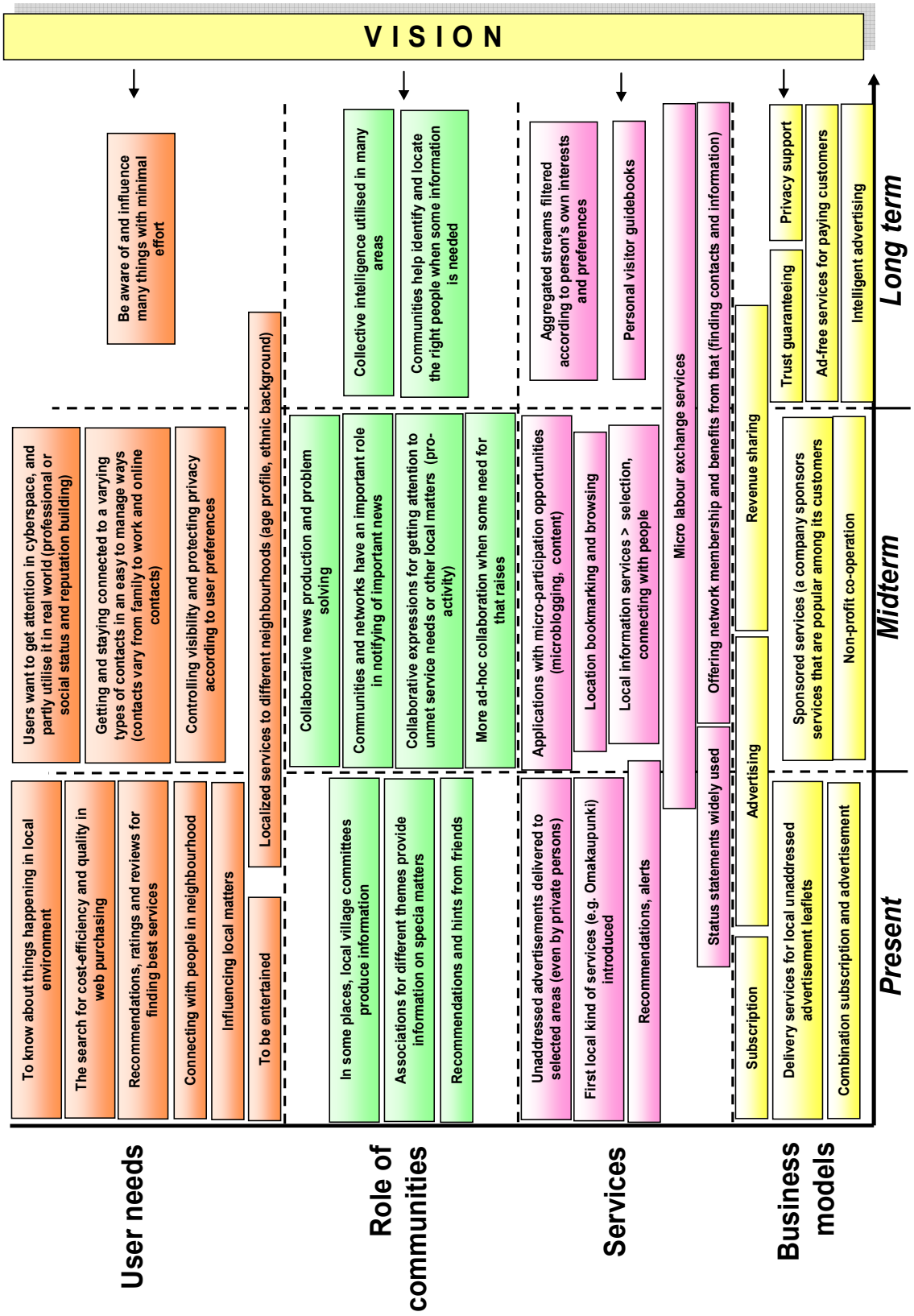

Figure 13. Roadmap: Social media in local environment.

5.3.3 Service examples

Travelling community

The first application example of the local environment theme is The Peer Travelling Agency. The agency is not so much a business as it is a community that functions in both the real and virtual worlds. The peer users exchange experiences, photos and videos as well as ratings and recommendations about the holiday trips they have made. Some members may organize a trip together, based on other members' recommendations. The benefits here are that it may be easier to rely on peers' opinions rather than advertisers' biased marketing information.

One example discussed upon in the workshop was a travelling planning service that is connected to Google Earth. It would combine geo-referenced information with destinations that would be potentially interesting for the different tourists. There would be information about time tables, example routes and combined with ratings and recommendations.

Keeping up with the current

The second example presents a new networked message system for the local environment. Bird watching as a community purpose; the point of this application is to join together the enthusiasts of a common subject, in a mobile virtual community. It is a messenger system that enables one user to communicate messages to other users in real time, say if one has seen a rare bird somewhere in the city, others may immediately be alerted. This application can be either solely mobile based or combine different means.

6. Conclusions

As a conclusion of the social media roadmap, we present the following five main development lines that are triggered by social media applications.

1. **Transparency.** The transparency of activities is a key feature in social media and it will be expected in other areas as well. Transparency is important for companies: value networks are faced with information flows coming through multiple channels that are outside corporate control. Companies have to adapt to the imperative of transparency and make sure that their brand promise matches their actions and services. In the longer term, public administration will face similar expectations. Currently the situation is quite ambiguous: some economically influential but closed nation-states, like China, have used "policy-tailored" social media tools to do the exact opposite to transparency, namely to limit and to monitor their citizens. However, these opaque governance practices will be increasingly challenged by the formation of global user communities. The information about successes and malpractices spreads through multiple social media channels. Also individuals are faced with ubiquitous transparency: things presented in virtual spaces are not easily erased. One can call this the "eternal memory". The authenticity of things will be valued even more by consumers in the future, and the increased transparency makes it possible for people to check it. The negative aspects of transparency are the narrowing of privacy and the tendency of companies to try to turn everything into business and sources of profit.

2. **Rise of ubiquitous participatory communication model.** There are more and more channels and applications to choose from for communication and media consumption. The social media induced interactive communication culture spreads to new application areas. Newspapers, urban spaces and television will all be supplemented with interactive applications. Contents are easily transferred from one medium to another. Contents are also fully accessible and utilizable in mobile services. Basically, two-directional and community-based communication will increase interactivity in every field, where it has some added value such as new services and improved user experience. This is the rise of ubiquitous participatory communication model and media. This development will lead to a communication paradigm that is not dependent on certain devices, but tools and channels will be more integrated. The possibilities of ubiquitous participatory communication media will be increasingly utilised in work: people work more and more in networks and distributed organizations. However, there are permanencies in the midst of the changes. For example, the art form of cinema will probably be untouched: people have yearning for stories that are skilfully drafted and coherent.

3. **Reflexive empowerment.** The rise of social media increases the empowerment of the citizens in many instances. Customers' empowerment towards companies also rises since customers are able to share their experiences in a more powerful way. The empowerment is manifested in channels that enable direct feedback and dialogue on the issues. Empowerment through social media is mostly reflexive, i.e. it is usually based on a specific issue and temporary coalitions that engage in dialogue on the topical issue. Reflexivity[6], or adaptivity, is based on virtual mob effects, on the power of crowds and distributed networks. Reflexivity and the mob effects form a two-way street: social media enables fast emerging and large-scale actions on e.g. important political issues, but social media also enables the formation of "negative communities", like racial hate groups. Social media induces new kinds of political and economic practices that are not based on the traditional political map. However, the key idea of the reflexive empowerment is that there are grass-root channels for the collaboration and co-operation on global scale. The efficacy of the activities relies on the network effect and the utilisation of open and voluntary peer participation.

4. **Personalization/fragmentation vs. mass effects/integration.** The key tension in the utilisation of social media is the dialectic of the fragmentation and integration. It means that practices and services in the web can be tailored and personalized to almost every detail and users can create portable profiles to be utilised in different applications. Networked communication lets information percolate through multiple channels. This forms a fruitful field for personal creative activity and identifying weak signals. Networks can be formed in organisations with colleagues based on substance and interests, and not necessarily just on organisational positions. This development creates markets for wandering professionals that work in several organizations and at the same time are important information links between them. Open innovation is becoming a shared practice in firms and organisations and it also feeds the network effects enabled by social media. There are also other directions to the development. Social media opens up vast potential for personalised content, and at same time, channels for enormous mass effects and integration. For example, rapidly created and dissolved one cause movements are examples of this development. Utilisation of a global pool of amateurs through crowd sourcing is another example. The forming of super-nodes, i.e. massively linked information hubs, created either by companies or by grass-root movements, raises the cumulative consequences of the network effect to another level. One message can be sent and percolated through these myriad channels backed up with effective

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[6] Interpreted with some latitude, the theory of reflexive modernization accentuates that constant reorganization of social structures and institutions is the key to societal progress (see Beck et al. 1994). In the context of social media, we use the term "reflexivity" to refer to constantly adapting and self-organizing communities and network structures.

promotional activities. Social media is, thus, a powerful mechanism also to "one-dimensionalize" and direct the worldviews.

5. **New relations of physical and virtual worlds.** The fifth development line is the new relations between physical, i.e. daily activity environment of the people, and virtual worlds. Practices induced by social media, e.g. communication, participation, co-creation, feedback and rating, get more common in daily environment. The cityscapes will be flooded with screens. These devices will support multi-directional communication – users can give feedback or leave their "footprints" either with mobile phones or direct contact with the device. Also, this communication can be directed to multiple parties: the comments can go to an intermediary who hosts the service or to some members of the user community. These communication platforms will be integrated into our daily living environment e.g. urban displays or product packages, through which people can rate products and services and give feedback or engage in discussion with the community. More and more activities can be globally shared and monitored in real-time. Virtual worlds will be entangled in the practices of daily environment in new ways. Some common practices of the virtual worlds, like logging into a service, may also become a common practice in the physical world so that personalised services and recommendations can be made in normal shops. There are also other interesting new relations between physical and virtual worlds. Communication between people is carried out both in physical and virtual worlds, and virtual communities can manifest also as physical world communities through clan emblems, gadgets and clothing.

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Appendix 1: Participants of the workshops

Participants of the first workshop

Ahlqvist, Toni	VTT
Ahtikari, Jukka	WM-Data Oy
Ailisto, Heikki	VTT
Anna Viljakainen	VTT
Antikainen, Maria	VTT
Bäck, Asta	VTT
Ervola, Kirsi	SOK
Halonen, Minna	VTT
Heinonen, Sirkka	Finland Futures Research Centre
Järvinen, Paula	VTT
Kaasinen, Eija	VTT
Lindqvist, Ulf	VTT
Lupander, Christian	Dicole Oy
Piira, Kalevi	VTT
Porkka, Janne	VTT
Sievänen, Mikko	SOK
Siltanen, Pekka	VTT
Suominen, Tuomo	WSOY
Tuomaala, Pekka	VTT
Vainikainen, Sari	VTT

Participants of the second workshop

Ahlqvist, Toni	VTT
Bäck, Asta	VTT
Halonen, Minna	VTT
Heinonen, Sirkka	Finland Futures Research Centre
Järvinen, Paula	VTT
Kaasinen, Eija	VTT
Lupander, Christian	Dicole Oy
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Social media roadmaps
Exploring the futures triggered by social media

Abstract

Social media refers to a combination of three elements: content, user communities and Web 2.0 technologies. This foresight report presents six roadmaps of the anticipated developments of social media in three themes: society, companies, and local environment. One of the roadmaps, the meta-roadmap, is the synthesis of them all. The society sub-roadmap explores societal participation through communities. There are three sub-roadmaps relating to companies: interacting with companies through communities, social media in work environment, and social media enhanced shopping. The local environment sub-roadmap looks at social media in local environment. The roadmapping process was carried out through two workshops at VTT. The results of the report are crystallized into five main development lines triggered by social media. First development line is transparency referring to its increasing role in society, both with positive and negative consequences. The second development line is the rise of ubiquitous participatory communication model. This refers to an increase of two-directional and community-based interactivity in every field, where it has some added value. The third development is reflexive empowerment. This refers to the role of social media as an enabler of grass-root community collaboration. The fourth development line is the duality personalization/fragmentation vs. mass effects/integration. Personalization/fragmentation emphasises the tailoring of the web services and content. This development is counterweighted by mass effects/integration, like the formation of super-nodes in the web. The fifth development line is the new relations of physical and virtual worlds. This development line highlights the idea that practices induced by social media, e.g. communication, participation, co-creation, feedback and rating, will get more common in daily environment, and that virtual and physical worlds will be more and more interlinked.

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