

The Role of Social Media in Research and Development

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<p>Social media have evolved from a mere source of entertainment to a serious and effective marketing and communication tool in the hands of competent and knowledgeable communication professionals. Nowadays there is no doubt that the use of social media in corporate communications increases the level of transparency in a company and makes information exchange faster, which leads to higher levels of work efficiency and trust among employees.</p> <p>The focus of this study was the research field in terms of organizational communication. The aim was to find out whether social media are used by researchers as an information channel and networking tool and to propose ideas for the development of these social media. The study concentrated on the basic functions of social media in research, their advantages and disadvantages and future developments in social media, so that they can become a more valid and effective information channel. The research was conducted with the help of a qualitative survey, which contained 13 questions requiring an essay answer. Ten researchers of different cultural and educational backgrounds working primarily in Finland participated in the survey.</p> <p>The results of the survey showed that there is a high degree of importance regarding social media in research. Like other media, social media proved to be an essential part of daily work communication in the research field. The author analyzed the advantages and disadvantages of using social media in research and proposed some ideas for improvement in this area.</p>	
<p>Keywords Social media, research, organizational communication, information exchange</p>	

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1 Introduction

Communication and information sharing have undergone many changes in the recent years. Social media invaded our lives and changed them and communication among people to a great extent. Little by little social media have been replacing live communication and traditional information sources changing our daily routines and facilitating communication with the rest of the world.

Scholars were able to recognize the indisputable benefit of social media for work purposes, which led to their frequent use in businesses all around the globe.

This study is devoted to the use of social media as an information source and information sharing tool in the field of research and development primarily in Finland.

There have been numerous studies on social media and yet there is still something undiscovered in this topic. I would like to examine social media as a tool for communication and source of information in the context of research and development and how it helps innovation in Finland and worldwide.

The purpose of this study is to find out what social media platforms people involved in research and development use; what works best for them and why. The objective of the research is to find out what can help researchers be more productive and what tools and applications would be useful for research and development in the future. The target group is the researchers primarily from Finland and also people involved in research and development outside Finland.

This study consists of the theoretical and practical research. The theoretical part of the study will consist of 3 chapters (chapters 2, 3, 4 in the table of contents). In chapter 2 I will discuss the definitions of social media given by different scholars and look into the types of social media and their role in the corporate communications of today's business life. In chapter 3 I will reflect on the role of research and development in business worldwide and in Finland and justify why I chose this particular topic for my research. In chapter 4 I will describe the research process and discuss the validity of my research.

Thereby the empirical part will consist of 2 chapters (chapters 5 and 6 in the table of contents). In chapter 5 I will describe the conducted research, analyze, and present its results and findings with the help of the theoretical framework. And in chapter 6 I will use the results to discuss the possibilities of improving communications among researchers and provide my recommendations for improving the communication strategy in R&D field.

2 The closer look at social media

Social media have become a hot topic of today; and there is barely anybody who hasn't joined or used a social media platform for one purpose or another. So what makes them so exciting?

Social media are a universal tool that can be used for leisure, communication and even business purposes. Numerous researches on social media have already demonstrated that they are able to improve company communications and marketing strategy contributing to the overall prosperity of a company.

This chapter deals with the general definitions of social media, where together with the scholars' ideas I will give my own insight into the idea of social media, what kind of new media are used for professional and work purposes and the role of social media in organizational communications.

2.1 Approaches to social media

According to Kietzmann, Hermkens, McCarthy and Silvestre (2011, 241-243), social media employ mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss and modify user-generated content. The framework of this theory is a honeycomb of seven functional blocks: identity, conversations, sharing, presence, relationships, reputation, and groups. Each block allows unpacking and examining a specific facet of social media user experience and its implications for firms.

These blocks are not necessarily present in every form of social media (Kietzmann, Hermkens, McCarthy & Silvestre 2011, 241-243).

As it is presented in the Figure 1, different social media platforms are built on different functional blocks: LinkedIn on Identity, Foursquare on Presence, Youtube on Sharing and Facebook on Relationships. "By analyzing the seven building blocks firms can monitor and understand how social media activities vary in terms of their function and impact, so as to develop a congruent social media strategy based on the appropriate balance of

building blocks for their community”. (Kietzmann, Hermkens, McCarthy & Silvestre 2011, 250.)

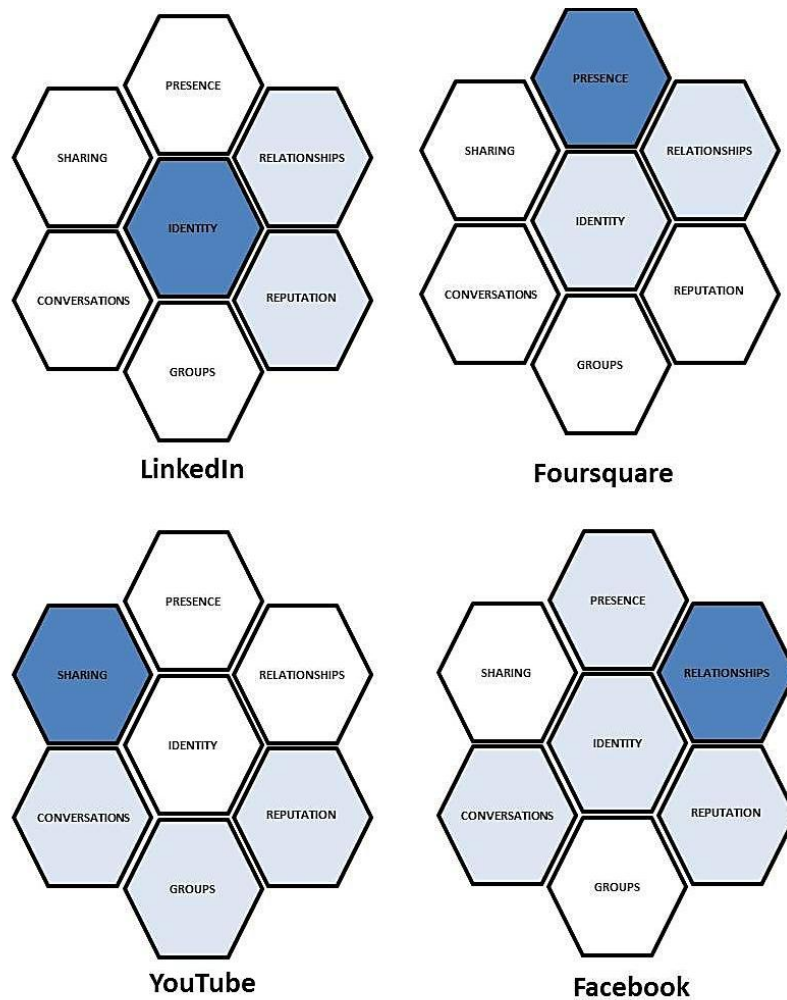


Figure 1: Honeycomb framework on the example of LinkedIn, Foursquare, Youtube and Facebook.

From my point of view, this theory enables us to understand the core functions of every social media platform individually. I believe that many social media tools have mixed features and functions but one feature always prevails over the others. For instance, according to the honeycomb framework, LinkedIn is built on the functional block Identity. This means that the focus of LinkedIn is people’s identity, i.e. people’s profiles

where they have their professional information. And the main purpose of LinkedIn is to provide the professional information to employers and network with other professionals in the area in question. Similarly, Facebook is built on “Relationships” functional block, which implies that the focus of Facebook is the links between people, their interaction and networking. YouTube is based on Sharing, which suggests that the main function of these media is collaborative information sharing (in this case video sharing). And finally Foursquare is built on Presence, which means that its core function is to register people’s presence and share this information with the others. I believe that this theory is quite precise and concentrates on the key functions of the given media, which helps us understand the tools that we have at hand and how to use them in the most efficient way. If we want to deliver a message to the masses, we should keep in mind the core functions of the media in question and use the appropriate ones in order to succeed.

There is another approach to what social media are.

S.M is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content. Web 2.0 is a platform whereby content and applications are no longer created and published by individuals, but instead are continuously modified by all users in a participatory and collaborative fashion. User Generated Content can be seen as the sum of all the ways in which people make use of Social Media. (Kaplan & Heinlein 2010, 61.)

From my point of view, this definition gives a more generic and somewhat technical view on what social media are. It discusses the components social media are comprised of and gives the overall idea about such concepts as Web 2.0 and User Generated Content.

The honeycomb framework and Kaplan and Heinlein’s view analyze social media from different perspectives. Kaplan and Heinlein concentrate more on the technical side of social media, and how the content is generated. The honeycomb framework on the other hand discusses the focus of individual social media tools and their functional value. These theories supplement each other and together give a good picture on the structure and functionality of social media.

Further on, the following are the characteristics that make social media (further referred to as SM) a unique media channel:

- SM are an entity which can embrace video, audio, photo, text, and .PDF platforms.
- SM are based on social sharing and news feeds through these platforms.
- SM are capable of creating one-to-one, one-to-many, and many-to-many interactions and offer different stages of engagement by the users.
- SM must be available on any device, and communication takes place in real-time (Jefferson & Traughber 2012, 3)

As far as I am concerned, it is hard to define social media in a single definition, since so many aspects have to be taken into account. It is a general term for a broad concept and all the approaches contribute to the general understanding of what social media are and what they are comprised of. I believe that both the honeycomb framework and Kaplan and Heinlein's theory very well describe two different aspects of the same concept and can't be considered separately. There is no better definition, since these two theories are mutually complementary.

2.2 Social media in business

The concept of doing business in a virtual world is still new and “scary” but full of opportunities. Social media in business can be seen as a set of highly effective tools for customer service, business-to-business and internal communications. Mostly social media tools are used in marketing, sales, public relations, and communications. (Safko 2010, 5-9)

The use of social media can result in a number of benefits for businesses:

- Social networks develop the trust that ultimately creates influence among consumers. (Safko 2010, 84)
- Social media can be used as a new platform for advertisement that has the potential to revolutionize the way companies present their services and products to consumers. (Jefferson & Traughber 2012, 2)

- Corporations can establish an image of innovation that can deliver a message to all generations (Jefferson & Traugher 2012, 2).
- Social media websites provide a direct line to consumers that in addition to all can allow companies to receive a direct feedback (Jefferson & Traugher 2012, 2).
- Forums, social networking profiles and wikis enable employees to offer their ideas and experiences when the project team signals the need for assistance (Jue, Marr & Kassotakis 2010, 8).
- Employees communicate more effectively, access needed information faster, and collaborate with a wider network across the globe (Jue, Marr & Kassotakis 2010, 8).
- Social media speed up the integration and adoption of corporate cultures and values, and serve as a bridge that spans cultures, fostering acknowledgment and understanding of diverse populations, beliefs, practices, products and services (Jue, Marr, Kassotakis 2010, 9).

In my opinion, it is of crucial importance to use social media tools in today's business life, since unlike other media it gives the opportunity to both manage employees globally and follow the consumers' behavior and constant feedback.

2.3 Social media in organizational communication

Building brand loyalty to products and services can only be achieved by the common effort of employees, clients, customers, suppliers, and partners. In order to gain and sustain competitive advantage, companies need committed employees and partners. If leaders are able to recognize the indisputable advantage of using social media in this changeable environment, it can create an extraordinary opportunity for the organizations. These tools are accelerating and enhancing employee innovation, engagement, and performance. The use of social media in organizational communication results in better business performance, creates long-term capability, and ultimately sustains business success (Jue, Marr & Kassotakis 2010, 2).

“Social media offer a great potential to share more, learn more, and accomplish more than it was ever possible in the past. Unlike traditional forms of media, which have limited pages or time on the airwaves, social media are “infinite” in their potential”. (Jue, Marr & Kassotakis 2010, 5.)

From my point of view, companies should be aware and make use of all the available tools for corporate communications to be able to get their ideas across to different target groups. Nowadays, word-of-mouth is of increasing importance in company marketing and communication; and companies should be able to utilize all the available communication tools, especially social media because of their increasing importance in every day communication.

2.4 Research Gate

There is number of social media platforms available in today’s world of science. Among them are LatticeGrid, SSRN, Social Science Space, Academia.edu, etc. Most of them offer such services for researchers and scientists as information sharing and networking. But I would like to pay special attention to the German-made social media channel, called Research Gate.

Research Gate is a closed social networking website created exclusively for researchers and research scientists. It serves such purposes as searching and sharing information, discussing current topics and connecting to other professionals in the field of research. There are numerous things that a researcher can do using the service, which facilitate the process of research and improve its quality in general: discuss the research and methodology with others, share the most up-to-date publications, stay tuned for scientific events and conferences, find jobs easily and network with others. The website was created by Ijad Madisch, Sören Hofmayer and Horst Fickenscher in Germany in 2008. The membership is free, and there are over 1, 9 million members from 193 countries. (ResearchGate 2012.)

I believe that websites like Research Gate should be actively promoted and used by researchers, since every person involved in research can find them useful in this way or another. The research is done globally and it is important for researchers to stay up-to-date in order to keep up with the rest of the scientific world.

3 Why research field?

In this chapter I will discuss the topic of research and development. First, I will speak about the importance of research and development (further on referred to as R&D) in general, secondly I will compare R&D in Scandinavia and other countries and thirdly I will discuss significance of R&D in Finland.

3.1 About research and development

According to Hirshfeld and Schmid (2005, 1), “R&D is the creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this stock of knowledge to devise new applications.”

If a company intends to do profitable business, it is not enough to just keep up with competitors. It must try to get ahead of them as soon as possible. The only way of getting ahead lies through innovation, which comes from research and development (Cho 2010, 2.)

Companies are aware that in order to make profit in the future, one should invest in research today. And the return on investment is acquired in a few years from the research. It is a big risk and it takes time, effort and money. But it is also a well-known truth that without R & D effort, there may not be any future for the company. (Cho 2010, 2-3.)

All in all, R&D is an extremely important activity, which is implemented in a small number of countries and has an enormous influence on the global economy (Hirshfeld & Schmid, 2005, 2).

3.2 R&D in Scandinavia in comparison with other countries

While R&D is concentrated in six leading countries – The United States, Japan, China, Germany, France and the United Kingdom, smaller countries play the key role in world’s R&D as well (Hirshfeld & Schmid 2005, 2). The world’s smaller developed nations, particularly in Scandinavia, have high levels of R&D support and this goes hand-in-hand with international collaboration and results in high-impact research results. The results and

the return on investment from research in these countries are sometimes better or at least as good as in larger countries such as the United States, France, Germany and Canada. (Maslen, University World News 2012.)

In order to understand how advanced in terms of research Scandinavian countries compared to other middle-sized and small countries are, I would like to compare them to, for example, Australia, which is one of the world's largest economies. According to International Monetary Fund (2011), it ranked 12th in the list of highest GDP countries, whereas Sweden was 21st, Norway 24th, Denmark 32nd and Finland 37th. However, it is important to keep in mind that Australia and Scandinavian countries have different business focuses, strengths of the economy and cultures, and therefore are difficult to compare. But nevertheless, I would like to consider this example.

According to *Australia's Position in the World of Science, Technology & Innovation* report (2012, 2-3), Australia spends about 2.25% of its gross domestic product on research and development compared with Denmark at 3%, Sweden at about 3.6% and Finland at almost 4%.

“Whereas Australia has just 8 researchers per 1,000 workers, Sweden has 10, Denmark 12 and Finland 16.” (Maslen, University World News 2012.) This very well demonstrates that in Scandinavian countries, especially in Finland, research is of bigger importance and more invested in, than, for example, in Australia. Also Australia's R&D like in the UK is concentrated on the higher education sector. “Denmark and Finland, on the other hand, have strong R&D workforce numbers in both the higher education and business sectors.” (Maslen, University World News 2012.)

“In 2010 around EUR 185 million more was used on research and development than one year previously”. (Statistics Finland, 2011.)

Clearly, Scandinavian countries are more concerned about R&D than many big countries in the world, which brings innovation to the Scandinavian market.

3.3 R&D in Finland

The following are the facts on the Finnish R&D expenditure.

“In 2009 research and development expenditure in Finland represented 3.96% of the gross domestic product, which put Finland among the EU and OECD top.” (Ministry of Education and Culture, 2012.)

According to a detailed analysis of the structure of R&D in Europe, R&D expenditure in Finland was the second highest in Europe (Invest in Finland, 2009).

The private sector investments constitute 71%, universities 20% and research institutes 9% of the total Finnish R&D expenditure. About half of the business sector investments come from the electro-technical industry (Ministry of Education and Culture, 2012).

Finland is doing well in the number of R&D personnel (ca. 80 000), but is still aiming at increasing the proportion of researcher trained personnel among R&D personnel from the current 14.1% to 20% by 2020. The number of doctoral degrees has settled to ca. 1 600 a year (Ministry of Education and Culture, 2012).

The latest statistics on R&D expenditure available are from 2010.

About EUR 7 billion was spent on research and development in Finland in 2010. The total amount of R&D expenditure was EUR 185 million larger than in 2009. Business enterprise R&D expenditure was more or less the same compared with the previous year. However, expenditure on R&D went up both in the public sector and in the higher education sector. (Finnish Science and Technology Information Service, 2011.)

The chart below represents R&D expenditure in business, public and higher education sector in the years 2004-2010. According to the chart, R&D expenditure in Finland has gradually grown from about 5,3 billion to 7 billion in 6 years. (Finnish Science and Technology Information Service, 2011.)

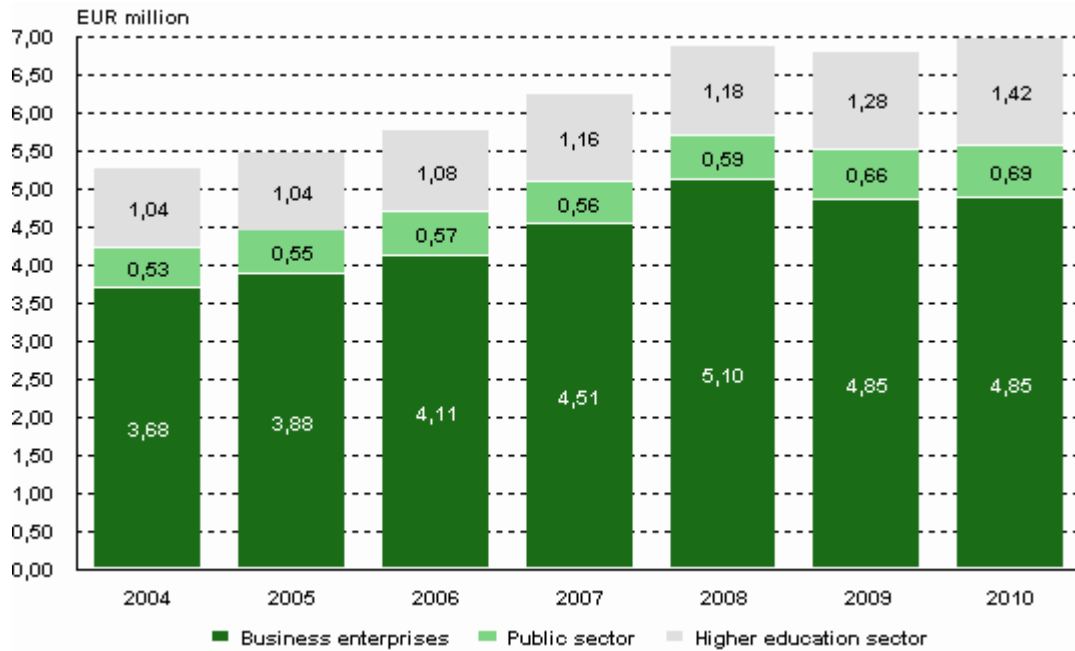


Figure 2. R&D Expenditure in Finland 2004-2010.

The importance of research is indisputable in Finland. Finnish companies invest a lot of money in research in order to produce unique innovative products and achieve competitiveness. Since research plays such a big role in Finnish economy, it is essential to realize how to help research grow and bring innovative solutions into the Finnish market.

4 The research process

In addition to the description of the empirical research on the usage of social media by researchers and people involved in research, this chapter also contains the method used, collection and the analysis of the empirical data. After the analysis I also discuss the possibilities of development of social media as a tool for research.

4.1 The research subject

The purpose of my research was find out if social media platforms are helpful as a source of information and a platform for information sharing in today's science world, in research and development in particular. The research was built on the following research questions:

1. Are social media used by researchers for work purposes?
2. Which social media platforms are the most useful ones in this area?
3. How do social media help researchers in their work?
4. What are the advantages/disadvantages of using social media in research?
5. What do the modern social media lack as a source of information?
6. How can social media be improved to serve as a valid tool for research?

4.2 The target group

The target group for this research was either researchers or people in some way involved in research. I was particularly interested in experienced research scientists from both industry and academia, since research work in these different branches differs to a great extent and approaches to search of information might be different.

The survey (described in a more detailed way below) was sent out to 25 people, out of which 10 responded. The respondents were people from a professional network and some of them were my personal acquaintances. They helped to spread the information further.

It took about 2 months to collect all the answers.

4.3 Research method

Research methods refer to systematic, focused and orderly collection of data. They are used for obtaining information, solving or answering a particular research problem or question. There are two research methods; qualitative and quantitative research. (Ghauri & Grønhaug 2005, 105)

It is easy to differentiate between qualitative and quantitative research methods.

Qualitative methods are used to describe characteristics and events without applying measurement or considering amounts. Quantitative methods, on the other hand, focus on measurements and amounts of the characteristics displayed by the people and the events that the research studies. (Thomas 2003, 1)

“Qualitative research studies things in their natural settings trying to make sense of, or interpret phenomena in terms of the meanings people bring to them. Qualitative research attempts to make sense of personal stories.” (Thomas 2003, 1.)

Quantitative research on the other hand uses numerical and statistical data. It is based on numerical measurements of different phenomena. Using observation and measurements researchers test their hypotheses in the most objective way. Both qualitative and quantitative methods have their strengths and limitations. (Thomas 2003, 2.)

I have chosen the qualitative approach to my research, because I believe that it is more suitable for the given topic. The qualitative method emphasizes understanding the phenomena from the respondents' point of view. (Ghauri & Grønhaug 2005, 105)

The purpose of the thesis was to find out personal experiences and aspirations regarding social media at work; therefore qualitative research is a better tool for finding the answers to the research questions rather than numerical measurements and statistics. In order to get a clear picture about people's experience and expectations, I had to collect their ideas, analyze them and try to communicate the message that came through.

4.4 Qualitative survey

Since research and development is a busy world of science, I came up with an idea of creating a qualitative survey, which would be essentially an interview but in electronic form, which the respondents could participate in when they have a spare minute.

The survey was created with the Internet platform Webropol available for Haaga-Helia students. Webropol is an excellent tool for people conducting different kinds of research. It offers several options which one can choose from according to his or her wishes.

My qualitative survey included a small introduction to the survey, 13 questions, 11 of which required a coherent answer. The respondents were specifically asked to give long and substantial answers where needed and every respondent was asked personally therefore the quality of the answers is unquestionable. The first question was about the general respondents' details: name, email, academia or industry worker, profession, country where the respondent resides and nationality. The second question was a quantitative one – how many times does a respondent use social media in his or her everyday work life. It was a necessary one since before asking details about usage of social media, I had to find out whether they are used at all and if it is a frequent phenomenon. The rest of the questions were open ones and required a full substantial answer.

4.5 Data collection and analysis

As mentioned above the data was collected through Webropol – electronic survey software. The survey was distributed to every respondent personally and the link to the survey was sent via email. The time for answering survey was not limited but the respondents were advised to answer in the earliest possible time. In the first three weeks since the survey was published the number of respondents accumulated to 10, which was the final number of the respondents.

After the data have been collected, they were thoroughly analyzed. The results were put down in words and some visual material was created.

4.6 Validity and reliability

Validity determines how truthful the research results are (Golafshani 2003, 599).

Some researchers believe that the concept of validity is not applicable to qualitative research since qualitative research is more abstract and subjective rather than quantitative research but at the same time there is a need of quality check equally in both qualitative and quantitative research. (Golafshani 2003, 600-602.)

Like validity, the concept of reliability is associated more with quantitative research. “If we see the idea of testing as a way of information elicitation then the most important test of any qualitative study is its quality.”(Golafshani 2003, 601.) A good qualitative study can help us “understand a situation that would otherwise be enigmatic or confusing” (Eisner, 1991, 58).

Since the concepts of validity and reliability were redefined to fit qualitative research, the only question remaining is: *“How to test or maximize the validity and as a result the reliability of qualitative research?”* (Golafshani 2003, 602)

The concept of triangulation can be used in order to check the validity and the reliability of qualitative research (Golafshani 2003, 603-604). Triangulation is defined to be “a validity procedure where researchers search for convergence among multiple and different sources of information to form themes or categories in a study” (Creswell & Miller 2000, 126). In other words, triangulation means use of several methods in research in order to verify the data and reach the best possible validity and reliability (Golafshani 2003, 603).

For this research it was enough to use one research method, since results were achieved easily and were clear and not contradictory. Therefore, triangulation was not applied in this research.

5 The findings and analysis of the data

In this chapter I will discuss the main findings and the results of the survey. I will look into every question of the survey individually, analyze them and present some graphical data.

5.1 Personal information

10 people participated in the survey, out of which 3 people requested anonymity. All the respondents happened to be male, even though I aimed at diversity (I believe that male sex prevails in this field). The majority of the respondents were foreigners working in Finland. The nationalities participating included Indian, Turkish, Ethiopian, Finnish, and Lithuanian. Roughly half of the respondents are workers from universities (academia) and the other half – from companies (industry). Seeking information was quite difficult, since even though there is quite an extended network of researchers in Finland, it is rather a closed one and it was challenging to find willing respondents.

The following chart represents the professions which took part in the survey. The target group was quite versatile since all the respondents had different roles in different companies in different sectors. Two respondents wished to be anonymous in their occupation.

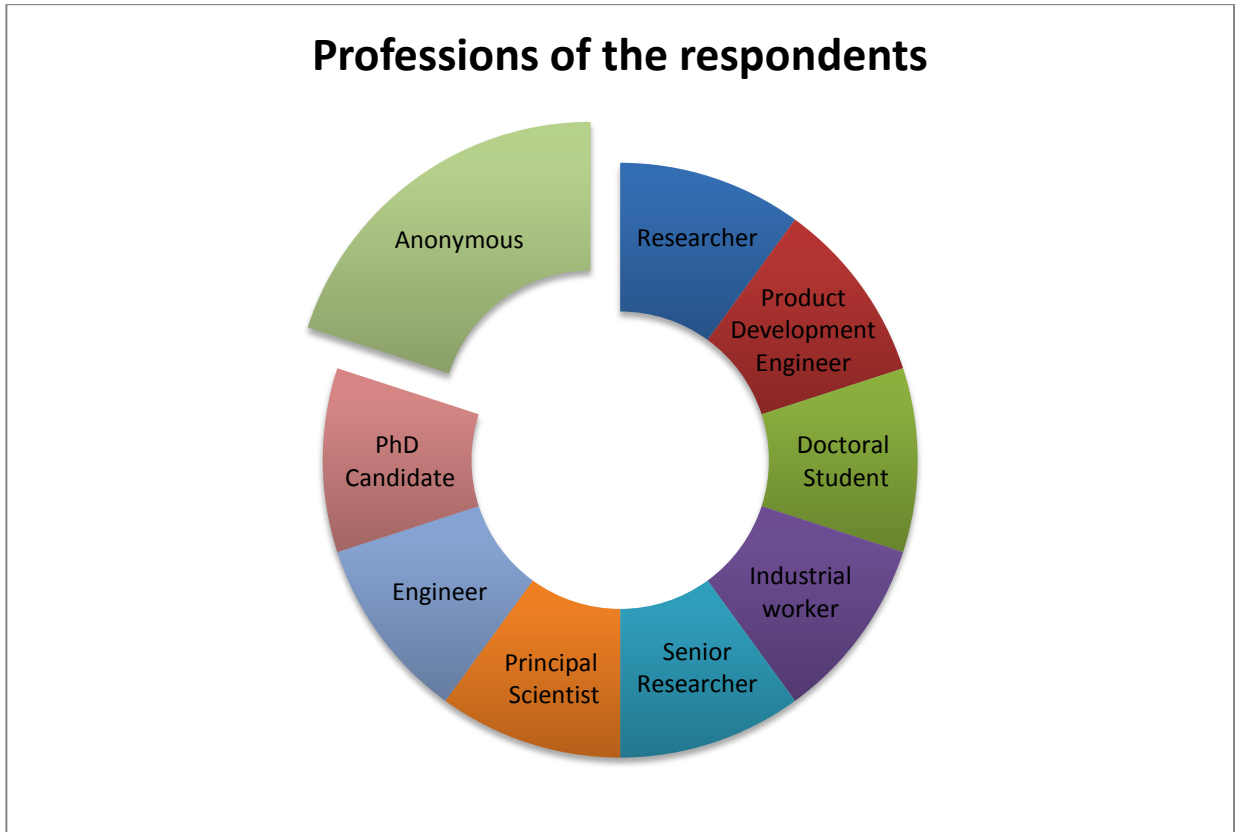


Figure 3. Professions of the respondents

It is difficult to estimate how many respondents are employed by companies and how many by universities, since a part of respondents wished to be anonymous but roughly the ratio is 50/50. The following chart represents the proportion. 4 respondents answered that they work in academia, 3 answered that they work in industry and 3 wished to be anonymous.

Academia vs Industry proportion

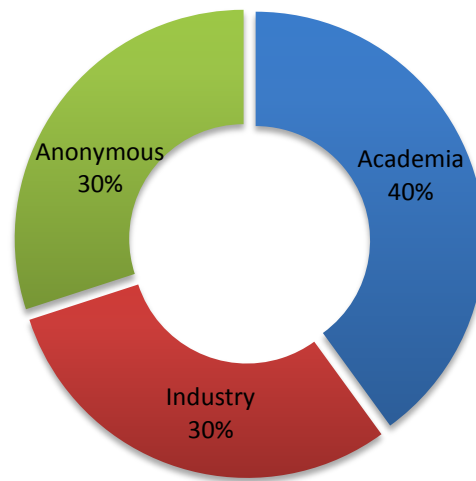


Figure 4. The proportion of the respondents from academia (university research)vs industry (company research).

5.2 The usage of social media in everyday work life

The overwhelming majority of the respondents (5 people) stated that they used social media platforms on a daily basis. 3 people use social media at least a few times a week. 1 person responded that his use of social media accounted to a few times a month and 1 person stated that he rarely used social media at work.

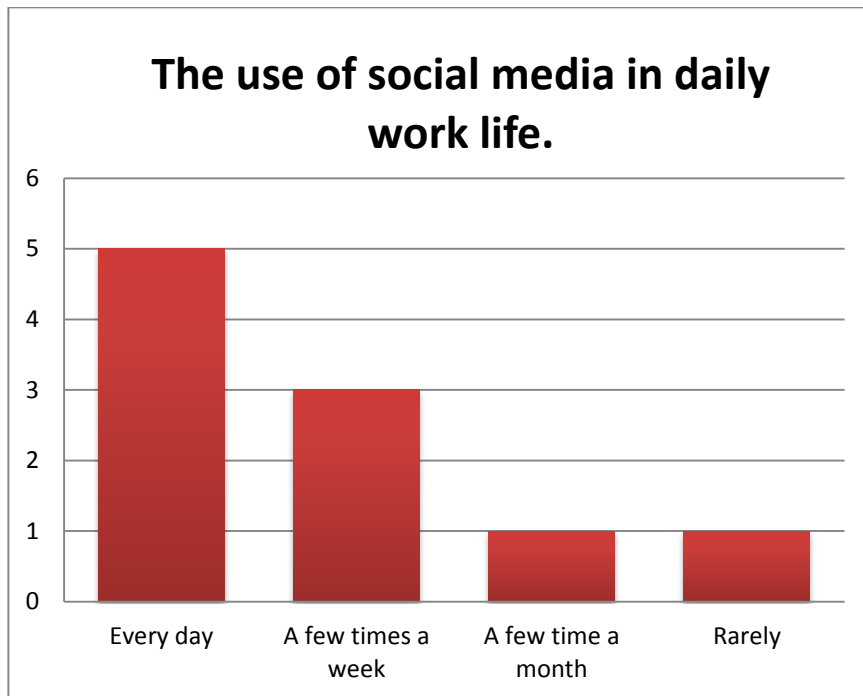


Figure 5. The use of social media in daily work life.

5.3 Social media tools

The aim of the question was to obtain information about what social media platforms in particular are used by researchers and what they find especially useful.

The pie chart below represents the social media platforms mentioned by the respondents while answering this question. As you can see from the chart the most frequently used platforms are Facebook and LinkedIn which share the equal percentage of the pie chart – 18%. From the survey I learnt that, in addition to others, researchers follow social media (Facebook) updates from various sources such as IEEE¹ Conferences (VTC², Globecom³, etc.) which gives them valuable information regarding upcoming deadlines, conference venues, etc.

Many respondents use LinkedIn for professional communications, updating knowledge, job search and sometimes Twitter for following trends in life.

Internet forums and Wikipedia rated second in the pie chart – both 14%. Also external forums are quite popular for quick problem solving, looking for solutions in technical problems arising in simulation environments or checking latest updates on company products.

Other mentioned social media tools are Twitter, other wikis and blogs, news groups, Ning, video sharing and company internal social media.

Surprisingly, none of the respondents was familiar with the Research Gate – a social networking website created specifically for researchers and scientists.

¹ IEEE is the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. IEEE and its members inspire a global community through IEEE's highly cited publications, conferences, technology standards, and professional and educational activities(IEEE 2012).

² IEEE VTC stands for Vehicular Technology Society Conference.

³ IEEE Globecom stands for Global Communications Conference.

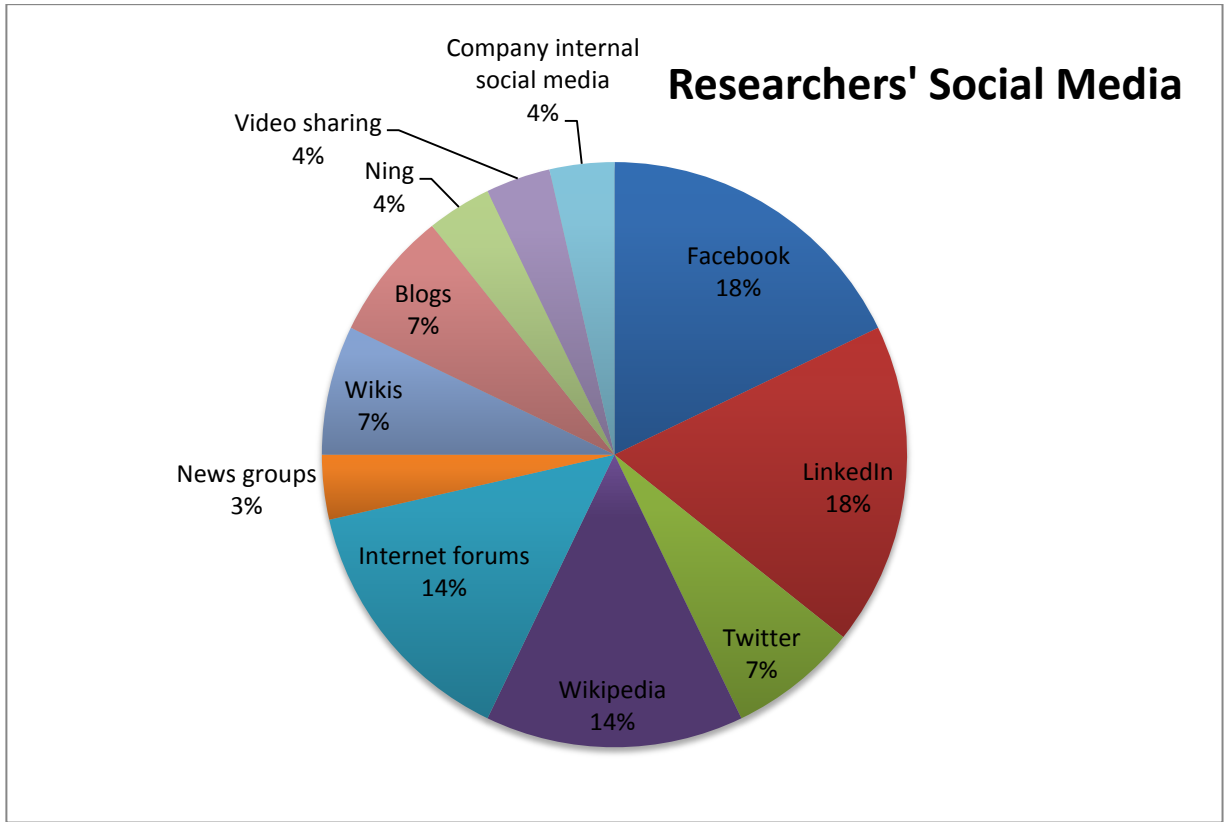


Figure 6. The variety of social media used in research

All in all, a big part of the social media mentioned were the traditional channels, which was expected. However, I learnt many others, which were found useful by researchers. It is a clear fact that the respondents understood what is meant by social media and they actually did take advantage of them at their work. The popular websites like Facebook, LinkedIn, Wikipedia, Youtube, Twitter and various internet forums proved to have a different purpose alongside with entertainment and leisure.

5.4 Internal social media platforms

Most of the companies in question turned out to have internal social media platforms for the employees to utilize in their work. I was surprised to learn that people involved in research use social media tools provided by their companies very rarely and some even never do. Some of them have a skeptical or even negative attitude towards this problem. However, there were positive comments too.

From the surveys I learnt that normally companies offer their employees such social media platforms such as blogs, and other internal webpages. There employees can find regular updates on research activities provided by other groups which is, as stated, very useful researchers' work. Some researchers are active users of company internal blogs, video sharing tools, and forums.

There are also discussions groups available which allow people discuss current issues, share technical material, collect views, comments and input at request.

On the other hand many respondents stated that they use social media tools provided by the company rarely, since there is "nothing good there". But those respondents who gave such an answer were neither active in the traditional public social media.

From my point of view, use of internal social media provided by companies should be encouraged. People who had a vague idea about social media or had a negative attitude towards it, probably, just didn't get good instructions on using it. However, it is nice to learn that social media have become a part of companies' communication strategy and internal communication tools have been developed and utilized to some extent.

5.5 Why use social media?

The researchers enumerated a number of reasons why use social media. Some of them find it useful to use social media to get regular updates from conferences and journal pages. Many researchers have to follow research organization pages to learn necessary information for their work and social media are a great source of information in this respect.

Additionally many respondents stated that social media are a key enabler in meeting and keeping in touch with other researchers from different parts of the world, with whom communication is normally difficult due to different geo-locations, get updates regarding their latest work, etc. LinkedIn was mentioned as one of the main social media tools for networking and keeping in touch with professionals from all over the world.

Wikipedia once again was mentioned as a source of quick information.

Discussion forums play a big role in researcher's communication since it is a great way to exchange information and share opinions.

People in question also use social media as a reminder for seminars, workshops, for posting surveys, finding interesting work-related (and not only) information, and also for relaxation.

Therefore, there have been many reasons and purposes of social media in research mentioned, which unquestionably proves the necessity of their use in research area. Social media have been gaining popularity due to their availability, simplicity, low costs and proven effectiveness.

The figure below represents 4 major functions of social media in research according to the respondents: obtaining and exchanging information, updating information, meeting and networking with other researchers. They form a cycle, which indicates that all the functions are interdependent and interconnected. Social media allows obtaining, exchanging, updating information and networking in real time. And there is no hierarchy

of more and less important functions. One function of social media begets another: obtaining information leads to exchanging and updating information and in the meantime it is implemented through networking. And this is how research is mainly implemented.

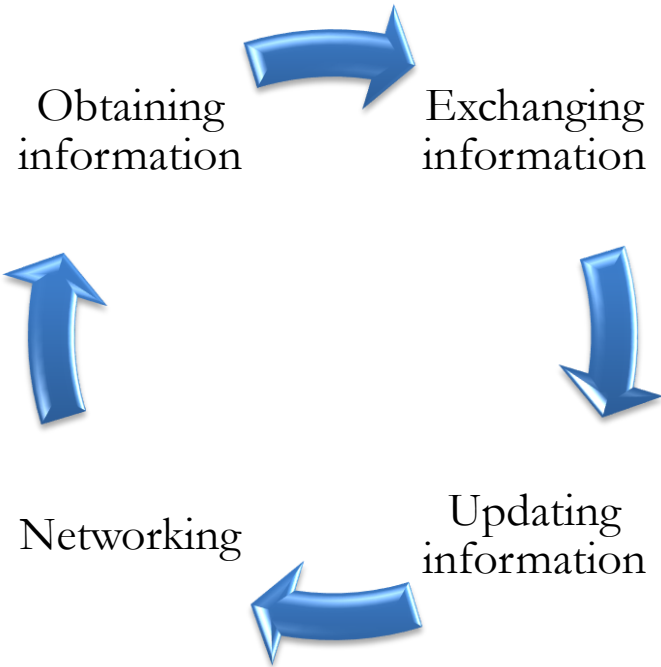


Figure 7: Social media information cycle in research

5.6 The effect of social media on work quality

Researchers actively answered this question and shared their insights willingly. The opinions separated in terms of how important it is to use social media in the work of researchers. Many respondents gave positive responses but quite a few were neutral or even negative in this topic.

For instance, one opinion was that “more frequent and concurrent updates lead to better quality of research, in sync with what is going on in the field of research at that moment”.

Another good example is that it “helps to boost the quality of research motivation”.

Some social media sources in particular were discussed. For example, Wikipedia turned out to improve the quality of researchers’ work, because “it’s an easy and quick source of information”. It is not always a reliable one but in many occasions it comes handy. Also “social media help a lot in following the trend of technology development and finding quick solutions to research/programming etc. problem”. Naturally information sharing is more efficient via the social media. “Information reaches people fast and equally”.

Social media make the work process faster. For instance, “if a researcher is looking for a solution to an already existing problem in a forum, he or she doesn't need to spend hours on finding the same solution in other sources”.

The respondents who don’t normally use social media in their work answered that they don’t anticipate any effect on their work. Some find it difficult to describe how it helps to use social media at work but they still consider it important. Some respondents were negative towards social media, since they might be a distraction at work and generally influence the quality of work negatively.

Generally, I believe that people who made a habit out of using social media at work were able to recognize their benefits more easily than those who did not. Some respondents had the old perception of social media and perceived them mainly as a leisure tool. It is important to recognize for research workers other sides of social media and learnt to take

advantage of them. However, as I mentioned before, the trend of social media have spread significantly and many researchers not only use them actively in everyday work but also clearly realize the benefits of using social media. And I believe this trend will grow further.

5.7 The role of social media in updating and sharing knowledge

According to respondents, social media is a key enabler for updating and sharing knowledge. It is essential for them to keep updating own profile in LinkedIn, and other forums regarding the latest published conference papers and articles so that everyone can be on the same page regarding the latest advances in the field.

Social media like wikis and forums play the key role in reaching the information which researchers need. They look for information not only from their own field but from others as well. And the main thing is that information in social media is constantly updated.

Social media plays a significant role since you don't only get information from others; you also provide information in discussion forums and other sources. Some researchers believe that wikis and forums are a new generation encyclopedia.

Yet some researchers believe that social media as they are do not advance knowledge sharing directly, while in some areas of business social media is more important.

In my opinion, social media undoubtedly helps to march in step with time in research where one should be well-informed and up-to-date. Information sharing happens faster, which leads to better and more up-to-date research and innovation levels.

5.8 The downsides of using social media for work purposes in research

There are quite a few downsides in using social media according to researchers. The biggest issue is the waste of productive hours while browsing updates, for example, in Facebook or Twitter, which are not directly related to work. Useless information jumps in and distracts from the main course.

Naturally the time is very important for researchers. Sometimes to obtain the inputs from social media could be difficult or takes time, especially you are searching for specific issue rather than common things.

Reliability of information provided by social media is mostly questionable. Hence finding the right social media channel and keeping it clean is important. However, if it is kept too clean (too private), it is not any more social media due to boundaries.

Spamming is another problem. Moreover face-to-face interaction is limited by social media, which sometimes kill the productivity and the work motivation (In social media communications, discussing everything is not possible (less sincere) and pointing out the problem or solution is not as easy as face to face discussions).

It is in use occasionally, so the response times are not predictable. It cannot be guaranteed that the proper persons as expected express their opinions. For interaction more direct ways are much more efficient. If dedicating to social media, it takes a lot of time. Being active in social media may not be the correct way of using time.

All in all, like in any kind of media social ones have downsides too. Nowadays social media are still imperfect and there is a lot to be improved. There is a problem of overflow of information, which usually means increased levels of useless and “trashy” information, which slows down the research process and decreases efficiency. The information found in social media is not always reliable, thus one should have a very critical approach in the process of information gathering. And of course, interactive information sharing can't and shouldn't completely substitute live interaction among people.

In the figure below some downsides of using social media as a work tool are presented. There are two major problems with the social media as an information source. The first problem is that there is a lot of garbage information available, which is mixed together with the valuable information. This leads to the waste of time and priceless working hours, easy distraction and low motivation and as a result low productivity. The other problem is the reliability of information available on social media. Nowadays it is still a big problem to be able to differentiate a valid source of information from not a valid one. The usage of unverified information can lead to further creation of low quality information.

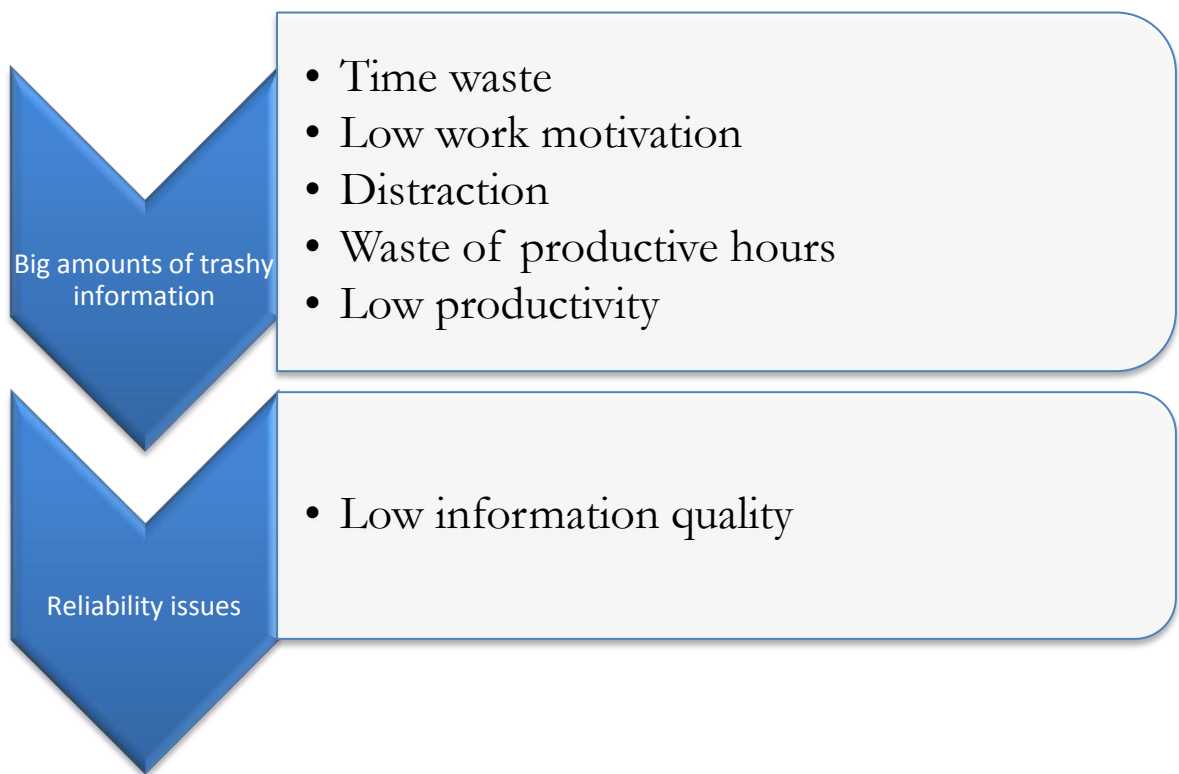


Figure 8: Downsides of using social media in research.

5.9 The advantages of using social media in research

Like disadvantages, there have been many positive sides mentioned.

Social media helps to reach wide community, share ideas freely compared to traditional media, be kind of your own boss, get information cheaper or free of charge.

Updates and information on the impact and expected results of own research work could be found. Up-to-date information since the information is almost all the time updated.

One of the main advantages of social media is its simplicity according to researchers. It is easy to reach information, easy to share and reach people; easy to follow-up (e.g., you can anytime watch the speech of your CEO and comment on it). It is a more democratic place to discuss current issues. Besides you can share expertise with other researchers, find interesting and useful articles, post surveys, etc.

However some of the respondents didn't see many benefits in using social media in research. They believed that sharing company views, opinions, information and contacts social media may have a role in other fields of business but not really in research.

From the discussion, I realized that today's professional media are indisputably social ones. These interactive tools allow much more than their predecessors and all are one-click-away. Not only do the researchers receive easy up-to-date cheap information in no time, but they also stay connected to the necessary professionals, build up networks, freely share their ideas and expertise and also get others' ideas and comments.

In the modern fast-changing world these characteristics make social media an irreplaceable tool for information sharing and everybody should learn to take advantage of it.

The figure below represents the advantages of using social media as an information tool and a research tool. There are three major benefits of using social media: reaching the community is easy; information retrieval is also easy and quick; and also social media makes it possible to work flexibly in the place and time convenient for a researcher. Reaching the community is done through networking and sharing expertise, which is

crucial in the work of researchers. Also working with information is of enormous importance; and social media provides an opportunity to easily reach, cheap or free-of-charge up-to-date information and follow the news in the world of science and research on a quick and regular basis. On the top of all, it allows researchers to speak out freely making everyone's opinions and ideas equally meaningful and significant.

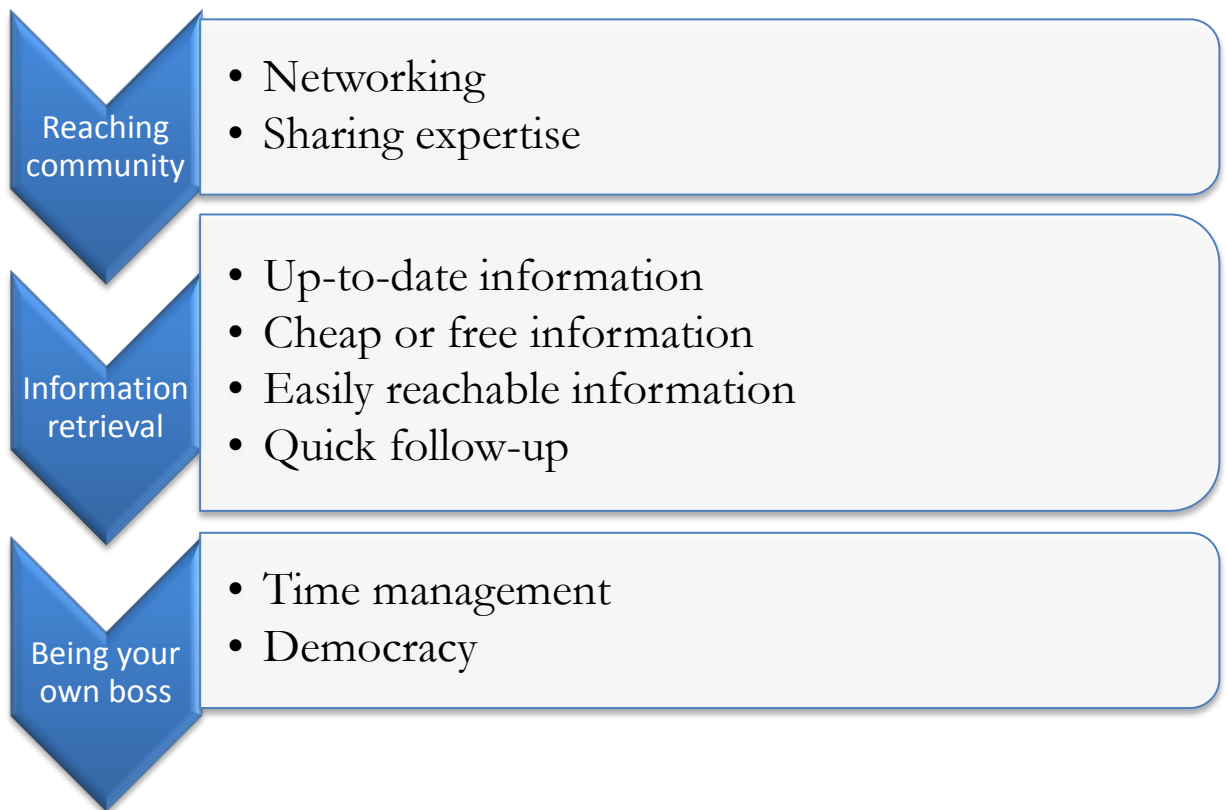


Figure 9: Advantages of using social media in research.

5.10 The importance of using social media tools in research and development

Even though in the previous question the opinions separated and the respondents had different views on whether there are advantages in using social media, in this question the opinion was almost unanimous – it is important to use social media tools in research and development. Even the respondents, who answered that they could do without them, also admitted that they make the work process faster.

According to some respondents, if you know what you need, using SM you can get the information expeditiously and reach a large variety of people, although sometimes difficult to get due to specification of problem. But mostly it has a positive effect. For example, while writing software codes you can miss something but using social media you can discuss the problem and find a solution with other engineers.

It is also important because of other additional reasons: following the trend of technology and development (What people would like to see as a new technology or what other researchers or leaders think about the recent developments), finding quick solutions for research or programming etc. problem.

Networking with other research people and people outside of research, e.g. to development may be a benefit.

Social media tools also give access to bunch of users that allows discovering their needs, or influencing their purchase intention.

All in all, it speeds up activities and improves work efficiency.

5.11 New generation social media: audiovisual presentation sharing tools and interactive discussions.

I received several interesting opinions on the matter of the new era interactive online media where you can share discussions and questions, etc.

The general opinion was that interactive audio-visual tools are much more convincing and helpful rather than passive tools such as presentations, documents, etc., since they give viewers a much more interactive feeling. Although there is a danger of minimizing lack of social interaction between people and foster building new types of relationships. However, respondents believe that in spite of these negative aspect face-to-face discussions and meetings are evolving towards such a mode.

Social media are constantly evolving with the development of technology. All the time social media are getting bigger and more effective. This puts distance between people and makes traditional discussions a part of history. It has both advantages and downsides. It is indisputably priceless to reach people from all over the world, but sometimes it puts a gap even between people who are close. This aspect is the major reason for negative attitude for social media among researchers.

People's psychology changes with these technological changes – for example, calling on the phone already feels too intrusive and people would rather discuss in the comfort of their own home or office physically away from their colleagues.

However some respondents believe that face to face meetings are so important and necessary that no social media replace them completely. Using social media in a correct way may provide benefits for communications; however it cannot replace face-to-face communications. Thus they should be used together. Face-to-face interactions are essential and are always more effective as one can closely follow the other, e.g. via mimics, which social media can't always provide or provides limitedly.

5.12 Researchers' proposals for development of social media

Although many respondents found it hard to make any predictions concerning social media evolution and use, some did manage to picture their future and express their aspirations concerning what will appear or disappear.

Some of the ideas included:

- Mobilization of social media and even greater integration into our community;
- Deletion of some unnecessary features and concentrating on the essential ones;
- Introduction of new more efficient ways of multi-party discussions;
- Sharing interactive drawing boards where researchers could have interactive brainstorming sessions;
- Introduction of e-identity to reflect the expertise of individuals;
- Making privacy and security issues better handled;
- Making social media smarter, more user-friendly and easy to use.

Along with these interesting ideas, nobody mentioned the future demise of social media. On the contrary, according to one of the respondent, “it is hard to predict the future disruption in concurrent social media”.

In the figure below you can see the proposals for development by the respondents. According to the latter, social media will evolve towards an elaborate research and information tool with some modifications, including mobilization of social media (making them available on any electronic device), introducing multi-party discussions, interactive drawing boards and e-identities for better team work and cooperation and generally making social media more user-friendly and easy to use making it more to-the-point and handling with current security and reliability issues. Those modifications alone are capable of turning social media and their contents into a valid information source and a number one information tool in research.

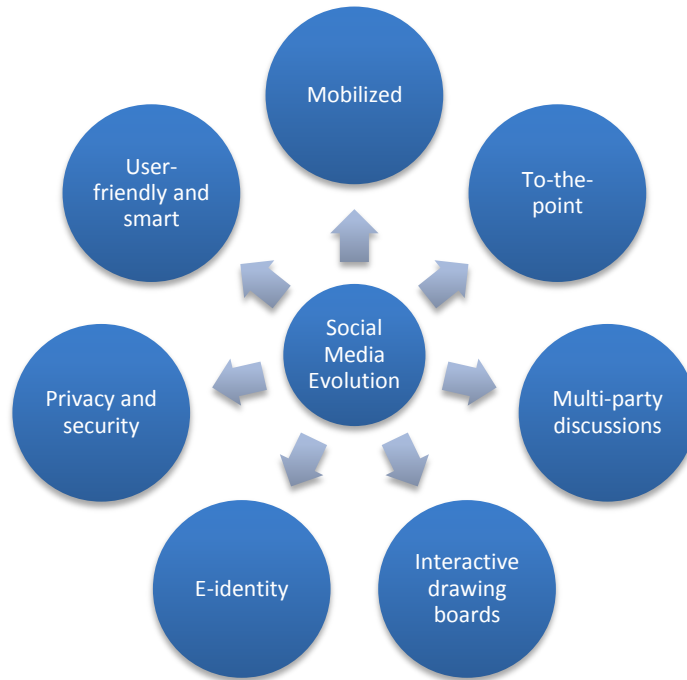


Figure 10: Evolution of Social Media.

5.13 The future of social media

It was a surprise to find out that according to some respondents, academicians and researchers are already increasingly resorting to social media to propagate their work and achievements. They were also unanimous on the opinion that the future trend would be even wider use of social media in fields where these tools are not effectively used.

Like in the previous questions the opinions on social media development were most positive and various. As mentioned before, social media are believed to become more mobilized, more effective by using technical interface, more focused one on its objective to share knowledge and update information only with people you choose easily.

There was a suggestion that information sharing will mostly happen through shared media instead of commonly used email attachments. On the other hand, if it happens, communication and information sharing might become more difficult due to a great amount of useless chat and getting sidetracked according to some of the respondents.

Some researchers believed that it would be good to have circles of people to share information with and listen to in social media circles of only colleagues, only researchers, only engineers and everybody. Social media should change and be smart enough for the people to be able to use it easily and not bother changing, for instance, privacy settings all the time.

However, some of the respondents didn't see any development for the field of research in particular. They believed that, for instance, in software development, social media could engage contributing in teams quite efficiently if certain disciplines in usage are established. It could fasten problem solving and could provide on-line help and on-line discussions on project-related common and timely problems. But there will be no changes for social media in research and they will remain unpopular.

Nevertheless, since people want and need to become more and more connected, social media will play a big role in this important undertaking. Future media of tomorrow will be both easy and complex; therefore people will need guidance to be able to use it efficiently.

6 Reflections and further research

According to the honeycomb theory mentioned in the Chapter 2, social media are highly interactive creative platforms built on the functional blocks which can be utilized by firms for reaching certain goals in communication (Kietzmann, Hermkens, McCarthy & Silvestre 2012, 241-243). One of the goals of this study was to reveal the functional blocks of some of the social media platforms and recognize the benefit of using them in the work of researchers. Another goal was to study the User Generated Content - a sum of all the ways in which people can make use of social media (Kaplan & Heinlein 2012, 61).

My findings and the analysis demonstrate the following. Most of researchers from different organizations do use social media both public and also private company-provided ones. The social media tools used by researchers vary a lot according to the habits and methods of work of the respondents, and therefore their choice of functional blocks of social media, the most popular ones being professional wikis (and also Wikipedia)-functional block Content, forums and discussion boards-functional block Interaction, LinkedIn-functional block Identity, notorious Facebook – functional block Relationships, etc. The social media platforms used by researchers help them in many ways: to obtain, share and exchange important information, update knowledge, connect to other professionals, follow the course of research and together find innovative solutions to the global problems and all that through User Generated Content.

Like any other channels of information and media, social media channels have their advantages and disadvantages. In the course of the research, the following characteristics of social media were revealed. On one hand they are easy, quick, available, democratic and life-facilitating means of communication, but on the other hand, they can be unreliable, distractive and sometimes even (paradoxically enough) anti-social (versus live communication). In any case, social media have one indisputable advantage – they are limitless, whereas all other media have a limit in this way or another.

Speaking of the improvement of social media for work purposes, it is clear that there is a lot to be improved. First of all, people should start looking at social media differently. Some still perceive social media as a pure entertainment channel. Social media should be officially introduced in companies as a communication tool and an information channel. Introduction to both company media and mainstream social media should be included in the initial training when a new employee is hired. Advantages of using social media should be highlighted and also disadvantages should be warned about. Some social media channels can be of a particular interest to researchers due to their availability and useful nature: like wikis and forums. The awareness of the social media for networking created exclusively for researchers and scientist, e.g. Research Gate, should be increased. On the other hand almost all social media tools can be utilized for work purposed and taken advantage of.

Nowadays social media contain a mixture of useful and useless information. Perhaps, this is one of the main reasons for the skeptical attitude towards them. To utilize social media as a source of information, one should naturally have a critical mind. But also social media themselves can be improved in many ways. It is impossible to, for instance, change the direction of Facebook completely towards business and work side, but it is possible to create more Facebook-like platforms and use the existing ones, e.g. Research Gate for networking and exchanging research material.

There are still many problems existing. Social media of today still deals with privacy and security issues, which definitely decreases the level of trust in it. For example, intellectual property posted on Facebook may end up in the wrong hands and will be lost. Or private information can be used in commercial purposes. There are plenty of unnecessary features, which should be removed by time. Reliability of information is sometimes questionable, which can be partially solved by periodical reviewing.

Suggestions of researchers should be taken into account. According to them, social media should be mobilized, which will allow an even easier access to them. Multi-party

discussion tools should be further developed and more efficient tools introduced. They may also include interactive drawing boards where researchers would draw their ideas and have interactive sessions online. More sophisticated online profiles will allow better networking and research news follow-up. Perhaps, an application like Facebook for business can be introduced.

Therefore, further research should be made upon:

- Research on existing social media platforms for researchers (e.g. Research Gate);
- Security, spamming, irrelevant features in social media, which could hinder the work of researchers;
- Work communication tools other than social media channels;
- Useful features of the existing social media and improving the quality of information in social media sources.

7 Conclusion

The purpose of this research was to find out if social media are a valid source of information for researchers, what exactly the most useful channels are and what kind of purposes they are used for. The aim was to understand if social media are worth developing as an information source and a research channel for the professionals in the area of research.

It was difficult to make conclusions since the scope of the research was not large. Only ten people participated in the research, thus the overall picture is quite limited. I can only make assumptions on the basis of what I learnt. But since the answers were mostly unanimous, I can assume that the research did give some results.

Social media are widely used as an information source, know-how storage and networking enabler. However, they lack some features, which prevents them from becoming the number one information source and winning the hearts of professionals in all the spheres. The general task of the future social media is to become as reliable, user-friendly and effective communication tool as no other means was before.

It is of particular importance in the area of research in Finland, since Finland (the most of all Scandinavian countries, which are at the top in the research sphere) is striving to have the best research in Europe and in the world. Finnish professionals should learn to take advantage of all the tools available to increase their knowledge and efficiency in order to bring research in Finland to a whole new level. In this respect, social media are an “uncut diamond”, which must be studied and developed further to become an irreplaceable part of our work lives.

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Survey questions

1. Please give your personal details (optional).
2. How much do you use social media in your everyday work life?
3. What kind of social media tools you use in general? What works best for you and why?
4. Do you use social platforms provided by your company? What kind of tools does your company offer?
5. For what kind of purposes do you use social media in your work? What is the most important one and why?
6. How much do you think the quality of your work is affected by the use of social media? Could you give examples?
7. What is the role of social media in updating/sharing your knowledge? (e.g. in wikis, forums)
8. What are the downsides of using social media for work purposes in research? Could you give examples?
9. What are the advantages of using social media in research? Could you give examples?
10. How important is it to use social media tools in research and development? How does it help research and development? Could you give examples?
11. What do you think about the new generation social media (e.g., where you can share your audiovisual presentations in addition to documents/slide sets as well as raise questions and discussions more interactively)? Do you think that it can minimize the lack of social interaction between people and replace the traditional face to face discussions and meetings?
12. What is missing in the social media of today? What would be useful in the future?
13. What direction would you foresee for the future of social media in work life and in research in particular? More important and widely used or the opposite? and why?