

SOCIAL MEDIA AND ITS EFFECTS ON INDIVIDUALS AND SOCIAL SYSTEMS

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Abstract:

In this paper we analyse the possible effects of social media on both, individuals and the society as a whole. First we illustrate the current situation of social media in terms of facts and figures before we deepen selected aspects of new forms of virtual interaction. With a specific focus on recent neuroscience research findings the following main research question is to be answered: How does our brain deal with these new forms of information technologies and what are the possible consequences for our social behaviour? There is a broad range of diverse interpretations related to the usefulness of social media as a powerful source of communication and learning. Through examining several advantages and disadvantages we will highlight the circumstances for responsible handling of social media. The examination takes place on two levels:

1. The global form of information and expressing opinions via social media and its impact on social systems.
2. The individual form of participating and the specific influence of social media on the own social behaviour.

Subsequently the effects of social media on the two levels above will be integrated into an overall picture. As main results of this study we can state that

- social media does have an impact on human brain and in consequence on the quality of our life,
- emotions play a crucial role in human communication,
- beside the generally known benefits there are serious threats for individuals and society and thus a need for a sensible social media interaction.

Keywords: social media, communication, human brain, learning, quality of life

1. INTRODUCTION

Based on the invention of Tim Berners-Lee communication in the world changed dramatically: Only 25 years ago, in 1989, the British scientist at CERN (Conseil Européen pour la Recherche Nucléaire) in Geneva (Switzerland) invented 'Mesh', the precedent of the World Wide Web (WWW). The web was originally conceived and developed to meet the demand for automatic information-sharing between scientists in universities and institutes around the world. On April 30th 1993 an open licence maximised the dissemination process. "Through these actions, making the software required to run a web server freely available, along with a basic browser and a library of code, the web was allowed to flourish" (CERN, 2014). Only ten years ago, in 2004, another communication revolution took place: the birth of Facebook with today a total number of monthly active Facebook users of 1.3 billion worldwide. Almost half of them are already *mobile* Facebook users (statisticbrain, 2014). The idea that people enjoy to be connected and to exchange their feelings and wishes has been THE success story for the 29 old, Ex-Harvard student Marc Zuckerberg (Facebook, 2014). Since then the way of communication has changed away from the classical one way or 'one to many' communication to a dialogue, interactive oriented 'many to many' model. These developments are still quite young in communication history and the consequences are not yet known. There are proclaimers stressing the chances and huge opportunities thanks to the new technology (e.g. democratic participation, e-learning, e-shopping). Others are pointing out possible dangers of these new forms of networks and communication exchange not only on a global (e.g. data protection, less freedom of personality) but also on the interpersonal and personal level (e.g. loss of life quality, emotional damages).

Within a few years social media has become an integral part of the world. Especially young people cannot think of communication without thinking of online-networks like Facebook, Google+, Twitter. Why are people so enthusiastic about using these new technologies of virtual interaction? Since the time of Aristotle humans have been described as social beings, and one might state these technologies allow them to act out their crucial feeling of social belonging accordingly (Spitzer, 2012, p. 109).

This paper aims to give an overview on a complex topic by analysing the possible effects of social media on both, individuals and the society as a whole. First we illustrate the current situation of social media in terms of facts and figures before we are deepening selected aspects of new forms of virtual interaction and global communication. With a specific focus on recent neuroscience research findings the following main research question is to be answered: How does our brain deal with these new forms of information technologies and what are the possible consequences for our social behaviour? There is only a one-way street. The development of new technology is not returnable. Nevertheless, we can ask the user to handle these new developments in a conscious and responsible way.

2. FACTS AND FIGURES

Only 25 years ago, the WWW was invented, only ten years ago, Facebook went online. Taking into consideration this short time frame, it is impressive to see how this development affected our daily life and behaviour. How important is to have access to the Internet with the right technology? What is the worldwide penetration rate and who owns a mobile telephone with 3G technology? The following numbers give an idea about important facts and figures around the global Internet environment.

In 2013, over 2.7 billion people were Internet users, which correspond to 39% of the world's population. In the developing world, one third (31%) of the population is online, compared with three quarters (77 %) in the developed world. Europe is the region with the highest Internet penetration rate in the world (75%), followed by the Americas (61%). In Africa, 16% of people are using the Internet – only half the penetration rate of Asia and the Pacific (International Telecommunication Union, 2013). In the developing countries almost three quarter (70%) of the under 25-year-olds (a total of 1.9 billion) are *not* online. This signifies "a huge potential if developing countries can connect schools and increase school enrolment rates" (International Telecommunication Union, 2013).

There is an increasing shift from the use of the 'classical' computer as a communication tool to the mobile phone. Even if nowadays, almost all people on Earth live somewhere within reach of a mobile-cellular signals (global penetration of 96% in 2013), there is still a huge gap of having access to those networks which have been upgraded to 3G technology, necessary to qualify as mobile broadband and provide high-speed access to the Internet: 74.8% in the developed world, only 19.8% in the

developing countries (International Telecommunication Union, 2014). But as networks are being upgraded and services accordingly offered in the market, mobile-broadband subscriptions will continue to grow strongly.

These facts and figures are underlying the importance of the Internet for the social communication system in general but above all the importance of exchanging news, information and learning tools on the individual level. Taking the example of Facebook as the largest online social network this web-based services allow individuals to "(1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (Boyd & Ellison 2008, p. 211). The frequency of communication via Social Media is continuously increasing. Taking the example of the continent with the highest Internet penetration rate worldwide in 2012 69% of the Europeans are indicating that they use social networks at least once a week; more than half of them (54%) every day. The percentage in the group of 15-24 is even much higher: Almost everybody (95%) use it at least once a week and 85% everyday (European Commission, 2012, p. 9).

Facebook statistics offer an inside view about the behaviour of the youth in the Internet on a worldwide basis. Almost half of the 18-34 year old check Facebook as soon as they wake up or before they get out of bed (28%). The average number of friends per Facebook user is 130 and an average number of pages, groups, and events a user is connected to is 80. 205 photos are uploaded per day (Statisticbrain, 2014). These numbers are underlying the intensity, importance and time consumption by using the Internet.

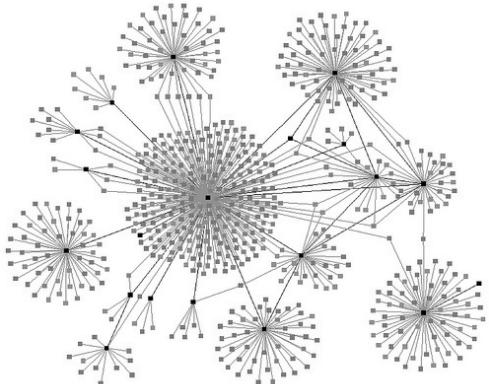
3. VIRTUAL INTERACTION AND GLOBAL COMMUNICATION

There is no single definition of 'What is Social Media'. There is more of a kind of description what is the process of social media by underlying the interaction among people in which they are creating, sharing, exchanging, modifying their ideas in virtual communities or networks: "Social Media is a group of Internet based applications that build on the ideological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (Kaplan, A & Haenlein, M., 2010, p. 61).

"Traditionally, consumers used the Internet to simply expend content: they read it, they watched it, and they used it to buy products and services. Increasingly, however, consumers are utilizing platforms – such as content sharing sites, blogs, social networking, and wikis" (Kietzmann, 2011, p. 241). With this description there is a clear distinction to the classical media like print or broadcasting where the user is more a passive consumer. With the term Web 2.0, developed by Tim O'Reilly during a brainstorming session at a conference in October 2004 (O'Reilly, 2005), the static Web 1.0 was left behind and the user was transformed into a producer of opinions by using specific tools and technologies like Cloud Computing. The user has moved from the consumer to the prosumer - a professional consumer. Another important change in information search is the shift from the push (getting the information on a passive way without being proactive) to the pull principle (being active in searching the relevant information) (Boundless, 2014).

New information technologies, changing behaviour in the use of technology and increasing demands of the information seekers bring new ways of exchanges not only on a two-way, symmetric communication process, but on a many to many exchange process (Shirky, 2008, p. 87). You have to react on what 'the many', the internet crowd, is demanding, no matter if you are a profit or a non-profit organisation, a politician or a CEO. These exchanges are often dominated by opinion leaders, testimonials, which are creating superhubs (Picture 1).

Picture 1: Net ‘works’ with ‘superhubs’



Source: Research to Action (2011).

Historically, political parties, organizations or companies were able to control the information about themselves through strategically placed press announcements and good public relations managers. “Today, however, firms have been increasingly relegated to the sidelines as mere observers, having neither the knowledge nor the chance to alter publicly posted comments provided by their customers” (Kaplan & Haenlein, 2010, p. 60). Another aspect involves the era of corporate web pages and e-commerce which started with the launch of Amazon and eBay in 1995 (Kaplan & Haenlein, 2010, p. 60). Since then global communication takes place also on the level of e-shopping, e-booking and e-payment. Huge data are transferred and saved in seconds worldwide to unknown servers. This affects the human being and the society as a whole also on another field: The Internet safety, or online safety. In a world where the data flow is controlled by external servers, data theft and data protection are the new buzz words. How is it possible to maximize the user’s personal safety and how to protect data on a global level from computer crime like malicious software? As the number of Internet users and exchange of User Generated Content increases daily worldwide, Internet safety is a growing concern for children, adults, organizations and even countries. This could even lead to identity theft on a local or global level. Events like ‘Safer Internet Day’ (saferinternet, 2014) should help to raise awareness on the individual level. More and more internet sites are created by governments or agencies to make citizens aware about these new threats of the personal identity and loss of personal data (getsafeonline, 2014).

One of the most important achievements of the “globalization from below” (Kellner & Pierce, 2007) or direct virtual participation lies in the democratization and participation process as an important tool to use against oppressors, major corporations and corruption. It is occurring locally, but spreading quickly on a global level via social media (Butts, 2012, p. 12). Taking the examples of the Arabic Spring countries like Syria and Egypt “social media and networking tools have been one of the most effective tools to direct political elections and social changes” (Yigit & Tarman 2013, p. 75).

The idea of a democratic Internet platform in a globalized world allows anyone to have a voice and to be heard as long as the user has some way to be connected to the Internet (Butts, 2012, p. 5). “The democratization of technology like Twitter is fundamentally changing the way people interact with one another, as well as with local opinion leaders, small businesses, and mass media” (Cha et al., 2012, p. 992). People search to promote themselves, to share experiences and to have fun. When Twitter launched in 2006, some of the first examples of self-expression were in the form of blogs (Hutton; Fosdick, 2011, p. 566, 567).

We are producing information locally and distributing it globally, almost in real time. This ‘global village’ is a revolutionary change in how we proceed information. “It is interactive; it is communal, and it is global” (Roach 2010, p.4).

4. VIRTUAL INTERACTION AND INDIVIDUAL COMMUNICATION

Beside the manifest benefits of online-communication on a global level highlighted above, what kind of adverse effects social media might have on the social interaction of individuals, namely of young people, and subsequently on social systems as a whole?

The anonymity of online-networks facilitates to take liberties with the truth and to misbehave without consequences. In social media one cannot trust the identity of people. Lies, deception and cyber-crime testify to that. In the field of scientific work for example individual mental contribution, often checked in essays, is required. Anonymity here causes a serious problem, since on special websites students are able to download, to buy and even to commission such essays. The web offers the possibility to fake individual mental effort, even though software to combat plagiarism is available but is only partly successful. Anonymity furthermore leads to misbehavior because of missing social control. One of this, well known especially to young people, is cyber-mobbing or bullying. (Spitzer, 2012, pp. 110-111). According to Tokunaga (2010, p. 278) "Cyberbullying is any behavior performed through electronic or digital media by individuals or groups that repeatedly communicates hostile or aggressive messages intended to inflict harm or discomfort on others". A representative survey among adolescent German aged between 14 and 20 years showed the following: 32 percent of the interviewees have already been once a victim of cyber-mobbing. Every one in five students are being directly threatened or affronted via internet or mobile phone. One in six suffered from slander and in case of about 10 percent their internet identity has been misused. One in five cannot exclude becoming potentially a bully oneself and almost one-tenth declare that they once have already been a cyber-mobbing offender. (Cybermobbing, 2011).

As humans tend to bow to peer pressure in real life and as well in social media, social media influences their ability to think independently. People seem to be more open to peer pressure within social networks. A study from Hewlett Packard Labs on social influence in online recommender systems measured how often choices were changed by others when facing different levels of confirmation and conformity pressures. The results showed that others people's opinions significantly sway people's own choices. People were more likely to change their own choices if some time had passed and when facing a moderate number of opposing opinions. The time people spend making their decision significantly predicts whether they will reverse their decisions later on. (Zhu, Huberman & Luon, 2012).

The use of media has an impact on social relationships, social well-being and time available for sleep, school related study and other activities. An online survey of 3461 North American girls aged between 8 and 12 years by Pea R. et al (2012) from the Californian Stanford University examined the relationships between social well-being, media use and face-to-face communication. Analyses indicated "that negative social well-being was positively associated with levels of uses of media that are centrally about interpersonal interaction (e.g., phone, online communication) as well as uses of media that are not (e.g., video, music, and reading)" (p. 327). Media multitasking was associated with a range of negative social indicators like feeling less successful socially, not feeling normal, having more friends whom parents perceive as bad influence and sleeping less. It was associated with more intense feelings toward online friends than in-person friends. The level of face-to-face communication was strongly negatively associated with media multitasking. These results suggest "that the growth of media multitasking should be viewed with some concern" (p.334). Conversely, face-to-face communication was strongly associated with a wide range of positive social feelings. "Higher levels of face-to-face communication were associated with greater social success, greater feelings of normalcy, more sleep, and fewer friends whom the children's parents believed were a bad influence" (p.334). The results suggest "that even media meant to facilitate interaction between children are associated with unhealthy social experiences. The idea that online communication would open up a rich social world that benefits young girls' social and emotional development is belied by these findings" (p.335). Furthermore the study suggests that face-to-face communication and online communication are not interchangeable.

Online-networks provide a platform for social comparison and envy. A study by Krasnova et al. (2013) in understanding envy dynamics on social networking sites (SNS's) in general and Facebook in particular showed that envy feelings are common on Facebook. About 36 percent of the people surveyed felt frustrated and exhausted *at least sometimes or more often* after spending time on Facebook. According to the findings the intensity of passive following is likely to reduce users' life satisfaction in the long-run, as it triggers upward social comparison and invidious emotions, with users mainly envying happiness of others, the way others spend their vacations, and socialize. The results "offer an explanation to the ever increasing wave of self-presentation and narcissism behavior witnessed on SNSs, a phenomenon we refer to as the self-promotion-envy spiral" (p.13).

According to Wilcox, & Stephen (2012) social online-networks can influence self-control, which is an important mechanism for maintaining social order and well-being. Research demonstrates that because people present a positive self-view to others on social networks, it momentarily increases the self-esteem in users who are focused on close friends. This leads them to display less self-control after browsing a social network compared to not browsing a social network. Greater use is associated with poor self-control in a number of important domains (i.e. health, mental persistence and spending/finance). Thus social network use may have a detrimental effect on well-being by leading certain people to exhibit lower self-control. “Given the ubiquity of online social networks, their ability to lower users’ self-control could have widespread impact. This may be particularly true for the current generation of adolescents and young adults who are the heaviest users of social networks.” (p. 4).

Social media has an impact on human brain and human identity. “The mind (...) is the personalization of the brain, a set of neuronal connection peculiar to each individual, driven in turn by that person’s particular experience and interaction with the outside world” neurophysiologist Greenfield (2008, p. 48) professor of Oxford University suggests. Due to the malleability of brains humans’ forte is the ability to learn and to adapt since we are sensitive to outside influences. The ability of brains to make connections shifts human from a purely sensory world into one with a personalized cognitive context one might call identity. Greenfield stresses that the outside world i.e. the influence of new technologies might be changing especially young people in ways that could be problematic for their identity. Given the plasticity of the human brain and the heavy use of social information technology among children what kind of effects might have living in two dimensions (i.e. real life versus virtual life) on our children’s brains? The strongly visual, literal world of the screen and the continued interaction with a fast-paced, multimedia environment might predispose brains to shorter attention spans and might even be related to the rise in cases of ADHD (attention deficit hyperactivity disorder). Furthermore it “might also affect our ability to develop the imagination and form the kind of abstract concepts that have until now come from first hearing stories, then reading oneself. Will future generations prefer the here-and-now, opting for a strongly sensory experience over a more personalized cognitive narrative? (...) The bottom line is whether here-and-now, fast-paced sensory experiences might change the way future generations see themselves and construct their identity. Given the malleability of our neuronal circuits, their exquisite sensitivity to activity, might we elect to remain in a more infantile world of passive reactivity to sensations? Could we even end up living in a world where there is no personal narrative at all, no meaning, no context, just the experience of the thrill of the moment?” Greenfield (2008, p. 49) worries.

Considering the results of the various studies new research demonstrate interesting correlations between the use of social media and the effects on individuals and society. But due to the fact that there are a number of influencing factors, which lead to extremely high complexity, we still understand little about the *causalities* and the role for example

- individual behavior (e.g. intensity of social media use, passive / active use, focusing on strong / weak ties etc.),
- users’ age and their ability to reflect own behavior,
- personality traits or even
- the social environment an individual is embedded in play.

Furthermore it is needed to be taken into account if a person already has social contacts in real life (i.e. in-person friends) as opposed to just communicate with virtual social contacts (i.e. online friends). All this might lead to differences in effects on individuals and subsequently on society.

5. CONCLUSION

Social Media is widely used and boon and bane at the same time. It facilitates global communication in seconds, connects deserted areas with the civilisation, plays an important role in e-commerce and above all in the participation and democratisation process. But the list of disadvantages and threats is also long. Does it not signify the abandoning of search machines, which are processing in an unpredictable algorithm logistic, a threat to scholarly knowledge? Do researchers jeopardise losing their gatekeeper function of deciding what is important and which results are relevant? Does global communication suggest one world or one system, in its purest form would it be “one world culture, one world economy, one political power and one language”? (Warlaumont, 2010, p. 205). “These days, one witty tweet, one clever blog post, one devastating video – forwarded to hundreds of friends at the click of a mouse- can snowball and kill a product or damage a company’s share price” (Weber, 2010).

The long term effects of the social media revolution are not known yet neither on the society as a whole nor on the individuals. Therefore, a thorough reflection is indispensable. Since the effect of social media is subtle and develops over time Wilcox (2012) suggests “Ultimately, the way you counteract this is by raising your self-awareness. It's not about don't spend time on Facebook, but just be aware of what it might be doing to you.”

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